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“Open Innovation in the light of Patent Law”

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Sign, to comply with Royal Decrees 99/2011, 1393/2007, 56/2005 and 778/98, in Murcia 2018, August 28.

A handwritten signature in black ink, appearing to be 'Oly U- W', is written over the text.

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All tables and figures are of own source.

LIST OF ABBREVIATIONS

BGB	German Civil Code (see “List of Legal Texts”)
BGBI.	Federal Law Gazette/Bundesgesetzblatt
BGH	Federal Supreme Court/Bundesgerichtshof
BPatG	(German) Federal Patent Court/Bundespatentgericht
CI	Closed Innovation
EPC	European Patent Convention/European Patent Law (see “List of Legal Texts”)
EPO	European Patent Office/EPA
GEIA	German Employees’ Inventions Act/Gesetz über Arbeitnehmererfindungen (see “List of Legal Texts”)
GPTO	German Patent and Trademark Office/Deutsches Patent- und Markenamt/DPMA
GTC	General Terms and Conditions
GWB	Act against Restraints of Competition/Gesetz gegen Wettbewerbsbeschränkungen (see “List of Legal Texts”)
IPR	Intellectual Property Right
OI	Open Innovation
OLG	Higher Regional Court/Oberlandesgericht
PatG	German Patent Law (see “List of Legal Texts”)
Rdn.	Margin number/marginal number/marginal reference number
R&D-BER	R&D Block Exemption Regulation (see “List of Legal Texts”)

SEP	Standard Essential Patent
TFEU	Treaty on the Functioning of the European Union (see “List of Legal Texts”)
TT-BER	Technology Transfer Block Exemption Regulation (see “List of Legal Texts”)

1 INTRODUCTION

Henry William Chesbrough coined the term “Open Innovation” in 2003. Thus he created a term for an approach to create innovations. The main part of this approach was to open up company boundaries. (Chesbrough, 2003, p. 43) Open innovation (hereinafter abbreviated as OI) was regarded very early on as decisive for creating innovations with a high degree of novelty.(Gassmann, Sandmeier and Wecht, 2004, p. 22)

Before the advent of OI, it was not customary to consider systematically the world outside during the creation of an innovation.(von Hippel, 1978, p. 40; Holt, 1988, p. 257; Baldwin, Hienerth and von Hippel, 2006, p. 1292) The future customers were also not comprehensively involved in the product development. This often led to customers rejecting the finished product. In contrast to this, OI results in an opening to customers and an early involvement of their concerns.(von Hippel, 1976, p. 213; Shaw, 1986, p. 45; Franke and von Hippel, 2003, p. 1212)

OI also changed the structures of the companies. Before OI began, the companies had a R&D department that was solely responsible for the development of new products. There was a strict separation between this department and other departments of the company.(Ili, 2010) Since OI, this strict separation was abandoned and an opening of the R&D department to the other departments resulted.(Petroni, Venturini and Verbano, 2012, p. 147) OI is nowadays widely used and successful products result from OI.(Rigby and Zook, 2002; Ferrary, 2011)

1.1 AIM OF THE DOCTORAL THESIS

The first version of the European patent law (EPC) was introduced on October 5, 1973.(EPO, 2016, p. 17) The current German patent law (PatG) is based on the version of May 5, 1936.(Bundesministerium der Justiz und für Verbraucherschutz, 2018) It is doubtful that the legislators took into account the requirements of the OI innovation method when drafting the laws.

The lawmakers did not regard the differences of inventors inside and outside a firm. The legislator did also not expect members of a crowd, whose contributions form together an invention.(Dubiansky, 2006, p. 36) It may be

assumed that the patent law was written without consideration of the properties of OI. Therefore, it cannot be taken for sure that the patent law and OI match together perfectly.

The aim of OI is to create innovations. It may be necessary to protect the resulting innovations by patents. But because of the characteristics of OI, is it possible that a patent will be granted? What other interactions of OI with patent law arise? The thesis at hand analyzes these questions.

1.2 IMPACT OF THE TOPIC

Marketable products became more and more technically demanding. This development overtaxed the R&D departments of many firms. (Rothwell, 1992) Firms are not isolated islands. On the contrary, they are linked together in networks. (Richardson, 1972; Kogut, 2000) It is obvious to use these networks to address this problem.

Nevertheless, R&D partnerships of firms, in order to form an OI network, were until the 1990s not popular in particular in low-tech industries. (Hagedoorn, 2002) Meanwhile, the situation has changed. OI as a R&D partnership, is no more limited to the high-tech industry. Firms outside this business field have also discovered the advantages of OI. (Chesbrough and Crowther, 2006) This trend illustrates the increasing importance of OI.

On the other hand the important role of patents can be learnt by the example of the GSM-market in the 90s of the last century, where Motorola could play a major role in particular because of its patents. (Bekkers, Duysters and Verspagen, 2002) Patents can be used as trading and bargaining assets. (Belleflamme, 2006, p. 283)

This thesis deals with the relationship between OI and patent law. OI as well as patent law are seen as important aspects in the economic life. It can therefore be assumed that their relationship is also significant.

1.3 STARTING POINT

As a result of OI, innovations are generated, which may be patentable. When a patentable innovation is created, the inventor's rights arise. In particular, the patentable idea constitutes a property right for the inventor. (Moufang, 2017 | Rdn. 10) Therefore, there may be automatically an intersection of OI and patent

law. The thesis at hand is concerned about this relationship between OI and patent law.

The free revealing of new products and services can be seen as a central element of OI, enabling others to use and possibly further develop the products and services.(von Hippel and von Krogh, 2006, p. 304) On the other hand, patents are prohibitive rights. This means, that a patent owner may prohibit any third party from using his patented idea. The goal of a patent owner may be to restrict the use of his invention in such a way, that he can produce his products without competitors. An alternative aim of the patent holder may be to obtain license fees. The use of patented ideas can thereby be prevented or at least regulated by patents.(Rinken, 2017f Rdn. 44)

The right to exclude everybody from using the idea claimed by a patent can only be breached by two legal means in Germany. First, the government is entitled due to §13 PatG to allow the use of a patent even against the will of the patent proprietor. So far there has only been one case where the state issued such an order.(Rinken, 2017c Rdn. 4) In addition, the BPatG is authorized to grant a compulsory license pursuant to §24 PatG, whereby a patent may be used on reasonable license terms. This legal instrument has also been used very rarely up to now.(Rinken, 2017e Rdn. 5)

Therefore, the free flow of ideas appears to be restricted by patent law. A logical consequence seems to be to assume a discrepancy between OI and patent law. Consequently, scholars recommend abolishing patent law. They believe that patents hinder OI. These scholars suppose that patent law even prevents innovations.(von Hippel and von Krogh, 2006)

On the other hand there are examples of OI and patent law supporting each other. One example is that patent law provides a marketplace for ideas, which promotes the transfer of ideas.(de Jong *et al.*, 2008, pp. 39–40)

The question of how OI should be viewed against the background of patent law is therefore at least not easy to answer.

1.4 MAIN RESEARCH QUESTION

The topic of the doctorate thesis is the relationship between OI and patent law, especially the influence of patent law on OI, which might be different to CI. Therefore, the main research question is as follows:

What is the relationship between patent law and OI?

OI and CI are both methods for creating innovations. It can be assumed, that OI and CI have aspects, which are similar, and that there are aspects of OI different to CI. These different aspects have to be found to analyze the special effect of patent law on OI. Therefore, the research question is directed to the special influence of patent law on OI, without the influence of patent law on aspects, which are common with CI. In detail, the main research question could be formulated as:

What is the relationship between patent law and OI because of the different properties of OI compared to CI?

The thesis should deal with the individual rules of patent law. The main research question can therefore be changed as follows, wherein the main research question is formulated in more detail:

Main research question

What is the relationship between patent law and OI because of the different properties of OI compared to CI with respect to the single provisions of patent law?

To ease the answering of the main research question, it is divided into several partial research questions. By answering the partial research questions, it will be possible to answer the main research question.

1.5 COURSE OF THE THESIS

The course of the thesis is explained by means of the figure 1. Then it is described which partial research questions are dealt with in the individual chapters.

1.5.1 Survey of the course

Figure 1 illustrates how the individual chapters of the thesis are related.

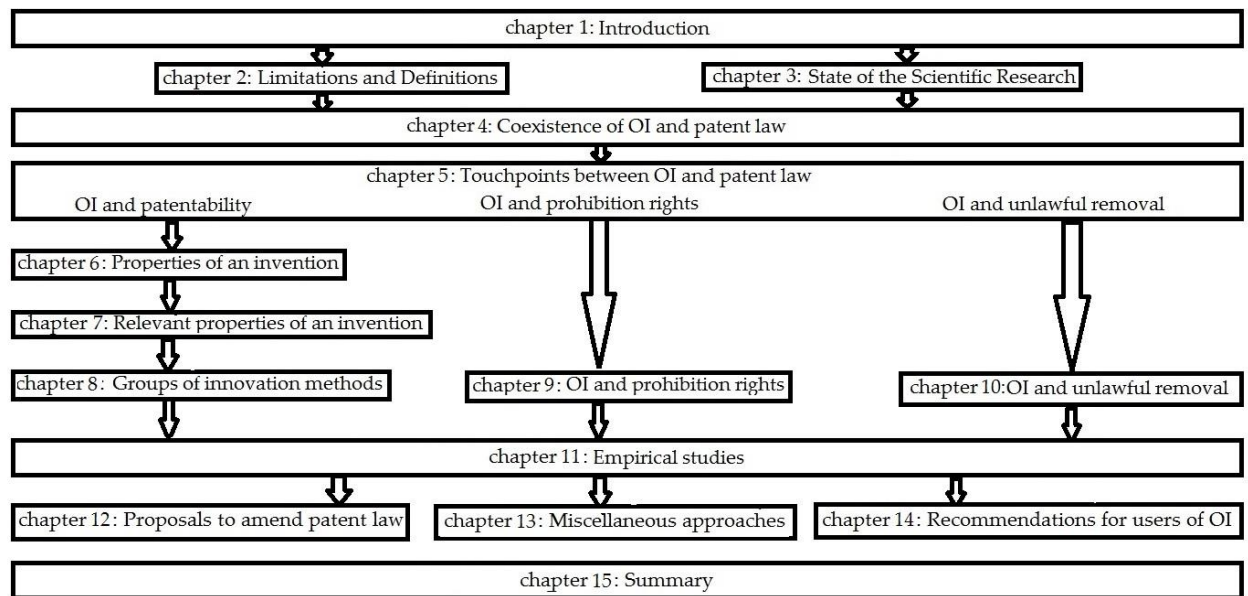


Figure 1: Structure of the thesis

Chapters 1, 2 and 3: After the first chapter, the introduction, definitions are worked out in chapter 2. Further the limits of the research area of the thesis are described in the chapter 2. In chapter 3, the current state of scientific research is analysed.

Chapter 4: This chapter examines whether coexistence between OI and patent law is possible at all.

Chapter 5: In this chapter the points of contact between OI and patent law are determined. There are three points of contact: OI and patentability, OI and prohibition rights and OI and unlawful removal.

Chapters 6, 7 and 8: The first point of contact, namely OI and patentability, will be examined in more detail. In chapter 6, the properties of an invention are first determined and in chapter 7 those properties that can be influenced by an innovation method, for example OI, will be identified. As a result it can be determined how an innovation method influences the properties of a resulting innovation of this innovation method. These results provide a grouping of innovation methods in the light of patent law in chapter 8.

Chapter 9: It is checked whether this grouping also makes sense for the other point of contact between OI and the prohibition rights of patent law.

Chapter 10: It is examined in chapter 10 whether OI and the legal instrument of unlawful removal result also in the same grouping of innovation methods.

Chapter 11: The theoretical findings are reviewed by empirical studies.

Chapter 12: This chapter comprises recommendations for the legislator based on the findings of the thesis.

Chapter 13: summarises different approaches to harmonise OI and patent law.

Chapter 14: gives the user of OI recommendations to avoid legal conflicts with patent law.

Chapter 15: is the summary of the thesis.

1.5.2 Partial research questions

The main research question is divided in partial research questions. In each chapter of the thesis one partial research question is answered. Chapters 1 and 15 are exceptions. Chapter 1 is the introduction to the topic of the thesis. Chapter 15 summarizes the results of the individual chapters and answers the main research question. The chapters 2 to 14 with their partial research questions are described below.

Chapter 2: Variants of innovation methods

The second chapter describes the area under investigation of the thesis. The necessary restrictions are determined and the methodical procedures are outlined. Further, definitions for important items will be found in case there are no generally accepted definitions.

The particularly important part of this chapter deals with the definition of OI. The relevant variants of innovation methods will also be determined. For this reason, the first research question arises as:

First research question

Which different variants of innovation methods can be distinguished?

Chapter 3: State of the scientific research

In the third chapter, the scientific literature is examined. It will be analyzed to what extent current scientific research can serve to answer the main research question.

Second research question

What can the current scientific research contribute to answering the main research question?

Chapter 4: Coexistence of OI and patent law

The next step will be to clarify whether OI and patent law can coexist at the same time at all. Only if OI and patent law can exist at the same time without excluding each other, it makes sense to examine the relationship between OI and patent law.

This question is justified because there are opinions that see a contradiction between OI and patent law. (Alexy, Criscuolo and Salter, 2009; Wilson, 2009; Hrdy, 2012) On the other hand, there are voices that speak of synergy effects. (Ordover, 1991, p. 55; Murray and Stern, 2007, pp. 649, 683; Aoki and Schiff, 2008; Gallini, 2014; Hagedoorn and Zobel, 2015)

Therefore, it will be examined, whether OI and patent law are principally compatible. Particularly, it will be analyzed, whether OI and patent law are controversial because of their mere nature. Therefore, the partial research question of this chapter is as follows:

Third research question

Is there a fundamental conflict between OI and patent law?

Only if this is not the case there can be a direct relationship between patent law and OI. Otherwise patent law and OI belong to different spheres, wherein a direct relationship is not possible.

Chapter 5: Touchpoints between OI and patent law

The next relevant aspect is to identify the possibilities of interaction between OI and patent law. It is certainly one connection between OI and patent law that the innovations of OI can be patented. But, maybe patent law can also have an impact on the innovation process itself. Furthermore, there can be more ways of interaction between OI and patent law.

Fourth research question

What are the touchpoints between OI and patent law?

In this context, the result of an innovation process, the innovation (Braun, 1991, p. 3), and the subject matter of patent law, namely the invention, will be

compared.(Keukenschrijver, 2016b Rdn. 6-10; Kraßer and Ann, 2016, §1 Rdn. 15-24; Moufang, 2017a Rdn. 15) In particular, the conditions that must be fulfilled that an innovation can be regarded as invention in the sense of patent law will be determined.

It is also to clarify whether an innovation according to OI can fulfill these requirements of an invention at all. The question that is being clarified here is therefore whether an innovation according to OI can become an invention due to patent law.

Further, there are the additional points of contact, namely OI and the prohibition rights as well as OI and the legal instrument of unlawful removal.

Chapter 6: Properties of an invention

The characteristics of an invention that influence the behavior of patent law are determined. For example, the properties that decide patentability are searched. The characteristics of an invention that are a prerequisite for an invention are disregarded. These characteristics must be fulfilled anyway, so that the patent law is relevant. Instead, the properties that influence the effect of patent law are to be determined.

One possibility of influence is that patent law lays down requirements that determine the patentability of an invention. It can therefore be examined to what extent an innovation of a special method of innovation meets or violates these requirements. In this way it can be determined whether the choice of innovation method has an influence on the patentability of the innovation in question.

Patent law deals with inventions and determines the necessary requirements of an invention to be patentable.(Kraßer and Ann, 2016, §25) These requirements can be regarded as characteristics of an invention. For example, an invention may be new or not. This characteristic of novelty of the invention is one of those, which decide about the granting of the invention.(Keukenschrijver, 2016g; Kraßer and Ann, 2016, §17; Moufang, 2017b)

Therefore, the properties of an invention due to patent law are searched for:

Fifth research question

Which are the properties of an invention due to patent law?

Those provisions of patent law have to be analyzed, which describe the properties of an invention, whereby these properties control the flow of patent law.

Chapter 7: Relevant properties of an invention

The properties of an invention due to patent law are examined to determine whether they are relevant in the light of the innovation method chosen. This means that those characteristics of an invention are sought which behave differently depending on the selected innovation method.

Sixth research question

Which properties of an invention due to patent law behave differently depending on the selected innovation method?

Such characteristics of an invention are in particular novelty, inventive step, mention of the inventor and ownership of the invention.(Keukenschrijver, 2016g, 2016j, 2016l; Kraßer and Ann, 2016, §§17, 18 and 19; Moufang, 2017b, 2017g, 2017l)

Chapter 8: Groups of innovation methods

The study of the properties of an invention under patent law can be used to evaluate the variants of innovation methods. This can lead to a new grouping of the innovation methods due to OI and CI.

Seventh research question

Which are the groups of innovation methods from the standpoint of the properties of an invention due to the patent law?

Chapter 9: OI and prohibition rights

The prohibition rights allow a patent owner to prohibit the use of the protected invention.(Keukenschrijver, 2016o, 2016c, Rincken, 2017f, 2017a) Therefore, an effect on an innovation method or on the result of the innovation method, namely the innovation, may result from the prohibition rights of patent law. Particularly, it will be checked whether the grouping found is also valid with regard to the prohibition rights.

Eighth research question

Which are the groups of innovation methods from the standpoint of the prohibition rights of patent law?

Chapter 10: OI and unlawful removal

An invention is deemed to have been withdrawn unlawfully if a person who is not entitled files a patent application for this invention.(Keukenschrijver, 2016n; Moufang, 2017n) Therefore, a further effect on the innovation method or the result therefore, the innovation, may result from the legal instrument of unlawful extraction. It is to clarify whether the grouping of innovation methods already identified remains in place even against the background of the legal instrument of unlawful removal.

Ninth research question

Which are the groups of innovation methods from the standpoint of the legal instrument of unlawful removal of patent law?

Chapter 11: Empirical studies

The empirical studies serve to check the theoretical findings and exclude the possibility of a serious error in the theoretical work of the thesis.

Tenth research question

Can the theoretical results be falsified by empirical studies?

Chapter 12: Proposals to amend patent law

The findings of the thesis are used to make proposals to the legislator to amend patent law with respect to the needs of OI.(Meitinger, 2016, 2017a, 2017d)

Eleventh research question

Which amendments of patent law make sense from the standpoint of OI?

Chapter 13: Miscellaneous approaches

In this chapter various legislative and judicial proposals, which do not aim for an amendment of patent law, were discussed. Further, new technologies are discussed that may lead to a better compatibility of OI and patent law.

Twelfth research question

What other possibilities exist to amend the situation for OI with regard to patent law?

Chapter 14: Recommendations for users of OI

Recommendations are given to users of OI to avoid problems with the patent law.

Thirteenth research question

Which recommendations for users of OI make sense from the standpoint of the patent law?

2 LIMITATIONS AND DEFINITIONS

This chapter first describes the area of examination of the thesis. Then, the methodical procedures for the discussion of legal texts are presented. Further, definitions are provided for the major terms which are needed in the thesis. The term invention in the sense of patent law is developed from case law. Furthermore, the different variants of OI which have to be examined will be defined.

2.1 FIRST RESEARCH QUESTION

The most important part of this chapter is to identify the different variants of innovation methods. For this reason, the first research question relates to these variants of innovation methods.

First research question

Which different variants of innovation methods can be distinguished?

2.2 LIMITATIONS

The scope of the thesis is determined by describing its limits.

2.2.1 Patent law

This thesis is based on German and European patent law. It can be stated, that there is no crucial difference between both. There is almost always a corresponding European regulation to a provision of the German patent law and vice versa. Indeed, there is even almost the same wording of corresponding provisions. (Schulte, 2017, pp. XIII–XVIII) Since German and European patent law is considered for Germany, the results initially apply to Germany. However, the knowledge gained can be applied analogously to other countries.

The case law of the German courts and the EPO will be used to interpret patent law. The national jurisprudence outside Germany concerned with EPC will not be regarded. The relevant German courts are the German Federal Patent Court (BPatG), Higher Regional Courts (OLGs), which are concerned with patent law, and the Federal Supreme Court (BGH). Moreover, the case law of the EPO is also taken into account.

2.2.2 Open innovation

It is assumed that an OI innovation process does have same and different effects on the resulting innovation compared to a CI innovation process. These different impacts result from different properties of OI in comparison with CI. These different properties will be examined to determine whether they are relevant before the background of patent law. Only those characteristics of OI that have an impact on the resulting innovation and are significant from the point of view of patent law will be examined.

2.3 METHODOLOGICAL PROCEEDING

The wording of law does not always properly fit to the situation of real life. Therefore, legal texts have to be clarified before the background of real life situations. As a result law has to be interpreted in order to be able to be applied on the concrete real life situation. (Barak, 2005, p. xv; Van Schooten, 2007, p. 3; Slocum, 2017, pp. 4–5)

The various methods to interpret a legal situation belong to the hermeneutic approach. (Levinson and Mailloux, 1991, pp. ix–xiii) In case the application of a first method does not lead to a clear understanding another method can be used until a convincing legal interpretation due to the concrete real life situation is reached.

In a first step to interpret a legal text, it is important to define the meaning of the single words of a provision. In a next step, there will be recognized the context of the words within the law. In a third step, if necessary, it will be regarded the motivation of the lawmaker. The question is what did the legislator want? By doing so, the intention of the lawmaker can be understood and therefore it is possible to apply the provision concerned on situations, which the lawmaker wanted to clarify. Another possibility of interpretation is to look at the circumstances under which the provision arose and determine the situations for which the provision in question was intended.

There are the following basic hermeneutical methods to interpret a legal text:

- Grammatical interpretation: method based on the wording of the provision (Mueller-Vollmer, 2006, p. 3; Jungmeister, 2016, p. 55)

- Systematical interpretation: method based on the context of the respective paragraph within the law (Schweighofer, 1999, p. 26; Jungmeister, 2016, p. 55)
- Historical interpretation: method due to the history of origin. What can the history of the law's origin tell us about its possible and appropriate application? (Schweighofer, 1999, p. 26; Jungmeister, 2016, p. 56)
- Teleological interpretation: method based on object and purpose. What did the legislator want to clarify with this legal regulation? What was his intention? (Schweighofer, 1999, p. 26; Jungmeister, 2016, p. 56)

2.4 DEFINITIONS

In case there is no generally accepted definition of a term needed for the thesis an appropriate definition for the purposes of the thesis will be formulated.

2.4.1 Invention

Due to §1(1) PatG the subject matter, which can be protected by patent law is called invention. The term invention is not legally defined.(Braitmayer, 2011 Rdn. 121; Moufang, 2017a Rdn. 14) Therefore, it is the task of jurisprudence to clarify, what an invention in terms of patent law should be.

The same applies to the European patent law. Article 52(1) EPC uses also the term invention as subject matter for which a patent can be granted. But there is also no definition by the patent law.(Visser, 2017, pp. 56–57)

Definition with the help of German case law

It was intended by the lawmaker to omit the definition of the term invention.(Braitmayer, 2011 Rdn. 121) By doing so the jurisprudence is enabled to define as invention what is currently regarded as technical teaching.(Schade, 1972; BGH, 1978a; van Raden, 1995; Kraßer, 2001; Moufang, 2017a)

Actually, there is no generally accepted definition.(Bartenbach and Volz, 2012, §2 Rdn. 2) But, there are several definitions, which enjoy a high level of acceptance.

The Federal Supreme Court defined the term invention as follows:

“...eine Lehre zum planmäßigen Handeln unter Einsatz beherrschbarer Naturkräfte zur Erreichung eines kausal übersehbaren Erfolges;...”(BGH, 1969)
(Translation by the author: a teaching for planned action using controllable forces of nature to achieve a causally overseable success)

This definition is well-known under the buzzword "red dove" ("Rote Taube"). According to this definition patentability, in particular novelty and inventiveness, is not a requirement of an invention. Therefore, there is an invention, even if the invention is not new and not inventive in terms of patent law. But, the technical aspect is a necessity of an invention.

The definition of "red dove" does not seem to be clear, because even the courts and the patent offices had problems to deal with. Especially the requirement of technical character led to difficulties.(BGH, 1980, 1986) Therefore, the definition "red dove" was criticized heavily.(Kolle, 1977; Nack, 2014; Kraßer and Ann, 2016, §11 Rdn. 2-3)

Based on the definition "red dove", a further definition of the term invention was found:

„Eine Erfindung im Sinne des Patentrechts ist eine technische Lehre. Dies setzt voraus, dass sie eine konkrete Handlungsanweisung gibt, einen praktischen Nutzen hat, in wiederholbarer Weise realisierbar ist und die technische Lösung einer technischen Aufgabe durch technische Überlegungen darstellt.“(Moufang, 2017a Rdn. 15) (Translation by the author: An invention in the sense of patent law is a technical teaching. This presupposes that it gives concrete instructions for action, has a practical benefit, is repeatable and represents the technical solution of a technical task through technical considerations.)

A definition, which is used quite often, is as follows:

“... die Erfindung [ist] eine auf schöpferischer Leistung beruhende technische Lehre zum planmäßigen Handeln...”(BGH, 1958, 1977; Bartenbach and Volz, 2012, §2 Rdn. 2) (Insertion in square brackets by the author) (Translation by the author: ... the invention [is] a technical teaching based on creative achievement for planned action...)

In a similar manner Braitmayer defines:

“...[eine] Erfindung [ist] eine Lehre, durch die eine praktische Anweisung zum Lösen eines (bestehenden) techn[ischen] Problems mit bestimmten konkreten techn[ischen] Mitteln gegeben wird.“(Braitmayer, 2011 Rdn. 121) (Insertions in

square brackets by the author) (Translation by the author: ...[an] invention is a teaching that gives practical instructions for solving an (existing) techn[ical] problem with certain concrete techn[ical] means.)

Patent law is not limited to a single inventor making the invention. Instead, there can be several inventors in accordance with §6 sentence 2 PatG.(Moufang, 2017l Rdn. 20) In this case the invention is made by several inventors, whose contributions form together the inventive activity due to §4 sentence 1 PatG. Therefore, the single contributions do not have to be inventive in terms of patent law. But, every single contribution must be at least a creative act.(Windisch, 1980; Kraßer and Ann, 2016, §19 Rdn. 17-21)

Summarizing the above mentioned, characteristics of an invention are that there is a technical character and an unlimited number of inventors can be involved. The invention does not have to be new or inventive.

Definition with the help of European case law

EPC does also not comprise a legal definition of the term invention. But at least, article 52(1) EPC describes, that an invention must lie in a field of technology. European case law has therefore established that an invention must have a technical character.(EPO, 2001b, 2004a, 2008b)

But European patent law has determined what is excluded as invention. Article 52(2) EPC designates objects which are not patentable due to lack of technical character. According to patent law, the following subjects do not have a technical character under patent law: discoveries, scientific theories, mathematical methods, aesthetic creations, plans, rules and procedures for mental activities, for games or for business activities, as well as programs for data processing facilities.(Visser, 2017, pp. 57–64) Further, only methods and products can be protected by patent law. Services cannot be protected since they are not technical.(Moufang, 2017a Rdn. 17)

The legislator has not imposed any restrictions on the number of inventors. According to article 60(1) sentence 1 EPC the inventor is entitled to the right to the invention. This comprises also a community of several inventors, who have the right to the invention in common.(Visser, 2017, pp. 129–130)

It is therefore also clear from European case law that an invention must be technical and can be created by any number of inventors.

Result

German and European case law define the term invention in the same way. An invention must have technical character. Therefore, for example, business models, services and mathematical formulas cannot be granted as patents because of lack of a technical character. Another requirement of an invention is that the invention is the result of a mental activity of a human being.(Deutsches Patentamt, 1951; Mediger, 1952, p. 67; Kraßer and Ann, 2016, §11 Rdn. 4; Meitinger, 2017d, p. 149)

It is justifiable to regard it as a condition of an invention that the invention has been uttered, i.e. that it has left the sphere of the inventor's brain. Only if the invention has left the world of thoughts of the inventor can it lead to legal rights.(Bacher, 2015 Rdn. 40) This characteristic is not taken into account, since inventions which have not been expressed can be regarded as not existing.

A definition of an invention due to patent law for the purposes of this thesis is as follows:

Invention

An invention is a technical teaching, which is the achievement of one or several human beings.

2.4.2 Innovation

For the economist Joseph Alois Schumpeter, an innovation represents a new combination of factors that lead, for example, to a new product, the introduction of a new production method or the development of a new market.(Schumpeter, 1926, pp. 100–101)

Further definitions of the term innovation are the following. Braun defines innovation as:

“Innovationen sind revolutionierende Neuerungen im Rahmen unternehmerischer Tätigkeit.”(Braun, 1991, p. 3) (Translation by the author: Innovations are revolutionary novelties in the context of entrepreneurial activity.)

Grupp provides another definition:

“Innovation bezieht sich als Substantiv auf eine realisierte Menge von Ideen.”(Grupp, 1997, p. 15) (Translation by the author: Innovation as a noun refers to a realized set of ideas.)

Hauschildt defines an innovation as:

“Innovationen sind im Ergebnis qualitativ neuartige Produkte oder Verfahren, die sich gegenüber dem vorangehenden Zustand merklich – wie immer das zu bestimmen ist – unterscheiden.”(Hauschildt, 2004, p. 7) (Translation by the author: Innovations are qualitatively new products or processes that differ noticeably from the previous state - however you determine it.)

Drucker defines innovation as follows:

“...Veränderung von Erträgen aus eingesetzten Ressourcen...”(Drucker, 1986, p. 62) (Translation by the author: ...Change in income from resources employed...)

Another definition was provided by Urabe:

“Innovation consists of the generation of a new idea and its implementation into a new product, process, or service, leading to the dynamic growth of the national economy and the increase of employment as well as to a creation of pure profit for the innovative business enterprise.”(Urabe, 1988, p. 3)

There are innovations as products, processes, services, business models, games and as software. Therefore, an innovation is not restricted to the technical field. An innovation does not need to have a technical character. But, an innovation must serve economic aims.(Drucker, 1986, p. 62; Garcia and Calantone, 2002)

The definitions comprise also the property of novelty. An innovation must be new. However, it is sufficient if the innovation is new at least for a certain group of people. It is enough for fulfilling the novelty requirement if the innovation is for example new for the members of the organization, which uses the innovation as a product or a service. Another possible group could be the members of a market for which the innovation is novel.(Garcia and Calantone, 2002)

An innovation can therefore for the purposes of the thesis at hand be defined as:

Innovation

An innovation is the result of an innovation process, wherein the innovation can be a product, process, service or other kind of economical object, and which is with some regard new.

An innovation is characterized as a result of an innovation process, wherein the corresponding innovation process can be one by OI or CI. The term innovation is not limited to a special type of innovation method.

2.4.3 Closed innovation

To distinguish between OI and CI, it is necessary to have organizational boundaries, because only under this condition a clear distinction between an innovation process within or outside an organization is possible. Therefore, an organization with boundaries is necessary to determine whether an innovation process was carried out according to CI or OI. (Loren, 2011, p. 5)

CI is a method for developing new products or services, wherein the entire innovation process is embedded in one single organization. Therefore, CI is a method for generating an innovation, such as a product or a service, wherein all the contributions to the innovation process come from the members of one single organization. The organization can be for example a firm or an university. An innovation process by CI is closed to the outside world of the organization concerned. A CI innovation is developed entirely within the company boundaries with its own resources. (Chesbrough, 2003, p. xx; Loren, 2011, p. 5)

There is an innovation by CI if this innovation is developed within an organization by its own members, for example employees. This results in the two essential characteristics of CI:

- one organization and
- internal inventors.

Therefore, a definition of CI is as follows:

Closed Innovation (CI)

CI is an innovation method for creating an innovation for an organization, wherein only internal inventors and only this organization is involved in the innovation method.

Inventors are those participants in an innovation process who make a creative contribution to the resulting innovation.

2.4.4 Open innovation

There is no generally accepted definition of the term open innovation. (Braun, 2012, p. 4) Therefore, based on the scientific literature, a definition of OI which is appropriate for the thesis is developed. In addition, possible variants of OI are determined from the general definition for OI and the definition for CI.

Definitions of the scientific literature

Chesbrough provided in his well-known book "Open innovation. The new Imperative for Creating and Profiting from Technology" the following definition:

"Open Innovation means that valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well. This approach places external ideas and external paths to market on the same level of importance as that reserved for internal ideas and paths to market during the Closed Innovation era." (Chesbrough, 2003, p. 43)

This definition describes the important aspect that the origin of an idea should not matter. As a consequence, an idea from outside should not be rejected because of this reason. If an idea comes from outside the inventors concerned are external inventors.

Three years later Chesbrough defined in a shorter way:

"Open Innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2006, p. 1)

Gassmann and Enkel state:

"Open innovation means that the company needs to open up its solid boundaries to let valuable knowledge flow in from the outside in order to create opportunities for co-operative innovation processes with partners, customers and/or suppliers. It also includes the exploitation of ideas and IP in order to bring them to market faster than competitors can." (Gassmann and Enkel, 2004, p. 2)

The term OI does not only comprise the process of creating an innovation, but also the steps of collecting and evaluating of ideas.(Blohm, 2013, pp. 41–42)

Consequently, West and Gallagher define OI as follows:

“We define open innovation as systematically encouraging and exploring a wide range of internal and external sources for innovation opportunities, consciously integrating that exploration with firm capabilities and resources, and broadly exploiting those opportunities through multiple channels.”(West and Gallagher, 2006, p. 320)

Dittrich and Duysters describe the properties of OI as:

“The system is referred to as *open* because the boundaries of the product development funnel are permeable. Some ideas from innovation projects are initiated by other parties before entering the internal funnel; other projects leave the funnel and are further developed by other parties.”(Dittrich and Duysters, 2007, p. 512)

Lichtenthaler provides the following definition:

“Open Innovation is defined as systematically performing knowledge exploration, retention, and exploitation inside and outside an organization’s boundaries throughout the innovation process.”(Lichtenthaler, 2011, p. 77)

In this sense, there is already OI if the innovation process is led by two firms, even if both firms keep the innovation process secret. Alone the fact that the innovation process does not run exclusively within one single company is sufficient to categorize it as an OI project.

In summary, therefore, OI is characterized by the fact that an innovation process results in an innovation, with at least part of the innovation process taking place outside the organization concerned. OI can therefore be defined as:

Open Innovation (OI)

OI is an innovation method for creating an innovation for an organization, wherein at least one step of the innovation method is outside this organization.

This definition of OI is very broad. In using this definition, there is no risk to exclude embodiments of OI. Therefore, the results of the thesis, based on this broad definition, can be regarded as not restricted to special embodiments of OI.

Steps of the innovation process are only those that contribute to the innovation process. Other activities, such as the administration of a website for supporting the innovation process, should not be understood as steps of the innovation process in terms of this definition. Steps in the innovation process are therefore only those that could comprise an inventive activity. The external step can be carried out by an external inventor or within another company.

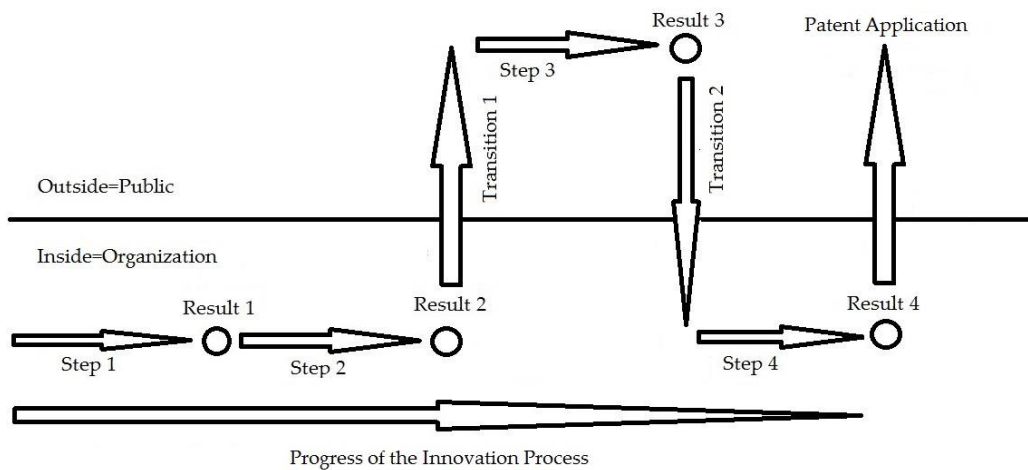


Figure 2: Basic situation of OI

The figure 2 shows the step 3 outside the organization as part of the innovation process, which is characteristic for OI.

2.4.5 Three variants of OI

Definitions of variants of OI are obtained through two approaches, on the one hand based on the definition of OI and on the other hand by using the definition of CI as a starting point. This procedure, i.e. using the definitions of OI as well as of CI as origin points, is intended to prevent a variant of OI from being overlooked.

First derivation

The above developed definition of OI is:

Open Innovation (OI)

OI is an innovation method for creating an innovation for an organization, wherein at least one step of the innovation method is outside this organization.

The essential aspect of this definition is the step of the innovation process, which is outside the organization. This step distinguishes OI from CI. This external step can take place in different ways.

The organization can use an external inventor to develop the external step of the innovation, wherein this inventor is not a member of another organization, which takes part in the innovation process.

Alternatively, the external step of the innovation process can result from developing an innovation together with another organization. In this case, an innovation is developed by at least two organizations. This variant of OI can therefore be seen as a R&D cooperation.

There is also a third option, wherein the organization develops the innovation together with one or several other organizations. Additionally one or several external inventors are involved in the innovation process.

Therefore, there are three different variants of OI, i.e. one organization develops the innovation with at least one external inventor, two or more organizations develop the innovation together, and the third variant is that two or more organizations develop the innovation with at least one external inventor.

Second derivation

Another way to develop variants of OI is not based on the definition of OI, but on the definition of CI.

Closed Innovation (CI)

CI is an innovation method for creating an innovation for an organization, wherein only internal inventors and only this organization is involved in the innovation method.

CI and OI are complementary concepts. In other words, if an innovation did not come from OI, it is an innovation because of CI and vice versa. Therefore, if there is no CI innovation, it must be one from an OI project.

The modification of one or both properties of CI (only internal inventors and only one organization) must lead to a variant of OI. There are therefore three alternatives for OI outgoing from the properties of CI.

The variants of OI are as follows:

Variant 1 of Open Innovation

One organization and at least one external inventor

Variant 2 of Open Innovation

Two or more organizations and internal inventors

Variant 3 of Open Innovation

Two or more organizations and at least one external inventor

Therefore, the variants resulting from both approaches are identical. These three variants of OI are used for further examinations. Inventors are those participants in an innovation process who make a creative contribution to the resulting innovation.

The variant 1 can be named as OI with-an-external-inventor. The variant 2 can be called as firm-to-firm OI (Hagedoorn and Zobel, 2015, p. 1050), because several organizations for example firms are involved. Consequently, the variant 3 is named as firm-to-firm OI with-an-external-inventor.

2.4.6 Variant 1 of OI

Variant 1 of OI covers those types of innovation methods whose innovation process takes place within one single organization, with at least one external participant.

Variant 1 of Open Innovation

One organization and at least one external inventor

2.4.7 Variant 2 of OI

Variant 2 describes two or more organizations with internal inventors. An internal inventor is one who belongs to one of the involved organizations. The inventor may also belong at the same time to two or more involved organizations. Variant 2, for example, describes a R&D cooperation in which several companies are involved. (Janeiro, Proença and da Conceição Gonçalves,

2013, p. 2017) For example, a company can enter into a R&D cooperation with a supplier, with the respective R&D departments being combined.(Bund, 2000, p. 176) Since particularly several companies carry out an OI project together in this variant, this variant 2 of OI is called firm-to-firm OI.(Hagedoorn and Zobel, 2015, p. 1050)

Variant 2 of Open Innovation

Two or more organizations and internal inventors

2.4.8 Variant 3 of OI

Variant 3 describes two or more organizations with an external inventor. An external inventor is one who does not belong to any of the two or more organizations involved in the OI project. Variant 3, for example, comprises open innovation communities, which have a large number of members with at least two firms and additionally external inventors and whose composition of the community of inventors may be subject to constant change.(Faber, 2008, p. 67) Since this variant not only involves several organizations in the OI project, but also at least one external inventor, this variant can be referred to as firm-to-firm OI with-an-external-inventor.

Variant 3 of Open Innovation

Two or more organizations and at least one external inventor

2.4.9 Crowdsourcing

Crowdsourcing is a made-up word consisting of crowd and outsourcing.(Howe, 2006) Crowdsourcing can therefore be understood roughly in the sense that an outsourced crowd is used to carry out activities for a company.

Crowdsourcing can be used to process repetitive and non-inventive activities through a crowd. On the other hand, crowdsourcing can be applied to generate innovations.(Franke and Shah, 2003; Franzoni and Sauerermann, 2014; Hartweg *et al.*, 2015, p. 4) In the latter case, crowdsourcing forms part of OI.(Sloane, 2011, p. 3)

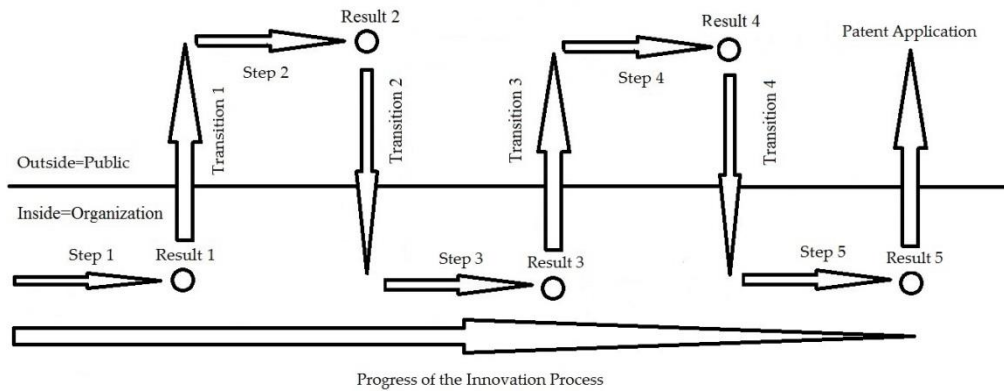


Figure 3: First variant of crowdsourcing

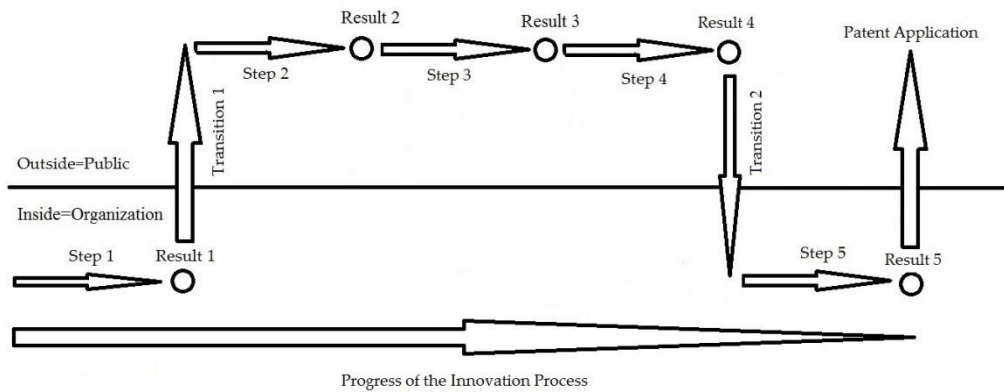


Figure 4: Second variant of crowdsourcing

The figures 3 and 4 show different variants of crowdsourcing. In the first variant there are several external steps of the innovation process, whereby there is an internal step switched between them. The second variant shows a sequence of external steps of the innovation process.

There is no generally accepted definition of crowdsourcing. (Estelles-Arolas and Gonzalez-Ladron-de-Guevara, 2012) But, there are different variants of definitions of crowdsourcing. Brabham defines crowdsourcing as:

“Crowdsourcing is not merely a web 2.0 buzzword, but is instead a strategic model to attract an interested, motivated crowd of individuals capable of providing solutions superior in quality and quantity to those that even traditional forms of business can.” (Brabham, 2008, p. 79)

Porta et al. describe:

“A second way emerging technologies enable new value through customer intimacy is via “crowdsourcing” and “crowdsupport.” These terms refer to enlisting customers to directly help an enterprise in every aspect of the lifecycle of a product or service.” (Porta *et al.*, 2008, p. 14)

Sloane regards as crowdsourcing:

“Crowdsourcing is one particular manifestation of OI. It is the act of outsourcing a task to a large group of people outside your organization, often by making a public call for response. It is based on the open source philosophy which used a large “crowd” of developers to build the Linux operating system.” (Sloane, 2011, p. 3)

Röller et al. define crowdsourcing as:

„Crowdsourcing bezeichnet die Auslagerung traditionell interner Teilaufgaben über eine Internetplattform an eine Gruppe freiwilliger User (die „Crowdworker“), die in Zusammenarbeit oder wettbewerbsorientiert an Lösungen arbeiten. Es kann sich um eine Vielzahl von Teilaufgaben aber auch um hochkomplexe, schwierige Aufgaben handeln, die nur durch das Netzwerk der User, Spezialwissen und Ideenreichtum lösbar sind. Crowdsourcing kann intern im Unternehmen mit festangestellten Mitarbeitern, extern oder in einer Kombination erfolgen.“ (Röller, Seidel and Schlegel, 2018 Rdn. 1) (Translation by the autor: Crowdsourcing refers to the outsourcing of traditional internal subtasks via an Internet platform to a group of voluntary users (the "crowdworkers") who work together or competitively on solutions. It can be a multitude of subtasks but also highly complex, difficult tasks that can only be solved through the network of users, specialist knowledge and a wealth of ideas. Crowdsourcing can take place internally in the company with permanent employees, externally or in a combination.)

Another definition is as follows:

„Crowdsourcing ist die Strategie des Auslagerns einer üblicherweise von Erwerbstätigen entgeltlich erbrachten Leistung durch eine Organisation oder Privatperson mittels eines offenen Aufrufes an eine Masse von unbekanntem Akteuren, bei dem der Crowdsourcer und/oder die Crowdsources frei verwertbare und direkte wirtschaftliche Vorteile erlangen.“(Papsdorf, 2009, p. 69) (Translation by the author: Crowdsourcing is the strategy of outsourcing a service usually provided in return for payment by an organization or private individual by means of an open call to a mass of unknown actors, in which the crowdsourcer and/or crowdsources gain freely usable and direct economic advantages.)

A further definition is as follows:

“Open Innovation ist eine wesentliche Ergänzung der internen Ideenfindung und Produktentwicklung eines Unternehmens. Eine Variante ist das Crowdsourcing. Hierbei wird eine große Zahl von Personen aufgefordert, zu einer vorgegebenen Problemstellung Ideen und Lösungen einzubringen.“(Geschka and Meitinger, 2016, p. 28) (Translation by the author: Open innovation is an essential complement to a company's internal brainstorming and product development. One variant is crowdsourcing. A large number of people are invited to contribute ideas and solutions to a given problem.)

Summarizing the above, the following aspects can be seen as characterizing crowdsourcing:

- Outsourcing of tasks of an organization, wherein
- members of a crowd perform these tasks.

A crowd can become a community, resulting in a lasting, productive cooperation between the crowdsourcer and the crowdsources, the members of the crowd. Therefore, if a crowd becomes a community a crowdsourcer can permanently benefit from the crowd.(Franke and Shah, 2003, pp. 164–166; Krogh, Spaeth and Lakhani, 2003, p. 1217; Meitinger, 2016, pp. 532–533)

It is possible, that crowdsourcing is processed with a crowd within one organization. This variant of crowdsourcing will not be recognized, because it lacks the property of at least one external step of the innovation process.

Therefore, the definition of crowdsourcing is as follows:

Crowdsourcing

Crowdsourcing as variant of OI is an innovation process for creating an innovation for an organization, wherein at least one step of the innovation process is conducted by a crowd outside the organization.

If crowdsourcing is organized by only one organization, it can be assigned to variant 1 of OI, since one organization and several external inventors are involved. If two or more organizations jointly organize the crowdsourcing project, a variant 3 of OI is on hand. For this reason, crowdsourcing can be OI with-an-external-inventor or firm-to-firm OI with-an-external-inventor.

2.5 ANSWER TO THE FIRST RESEARCH QUESTION

Definitions for CI and OI were developed from which the variants of the innovation methods could be derived.

Definitions of CI and OI:

Closed Innovation

CI is an innovation method for creating an innovation for an organization, wherein only internal inventors and only this organization is involved in the innovation method.

Open Innovation

OI is an innovation method for creating an innovation for an organization, wherein at least one step of the innovation method is outside this organization.

There are four different variants of innovation methods:

Closed Innovation (CI)

One organization and internal inventors

Variant 1 of Open Innovation (OI with-an-external-inventor)

One organization and at least one external inventor

Variant 2 of Open Innovation (firm-to-firm OI)

Two or more organizations and internal inventors

Variant 3 of Open Innovation (firm-to-firm OI with-an-external-inventor)

Two or more organizations and at least one external inventor

3 STATE OF THE SCIENTIFIC RESEARCH

The purpose of this chapter is to provide an overview of the current scientific research on OI before the background of patent law. It is intended to clarify whether the main research question remained unresolved by the scientific research up to now.

3.1 SECOND RESEARCH QUESTION

The state of scientific research will be reviewed to clarify, whether it can be used to answer the main research question.

Second research question

What can the current scientific research contribute to answering the main research question?

3.2 CURRENT RESEARCH FIELDS

The current scientific research focuses in particular on two topics. It is discussed whether there is a controversy between patent law and OI. On the other hand the scientific research examines the possibility of coexistence of OI and patent law. These main topics can be divided into the following sub-topics.

Controversy between patent law and OI:

- Fundamental conflict between OI and patent law: It is discussed, whether there is a fundamental conflict between OI and patent law.
- Patent law and OI as each excluding alternatives: It has been described that it makes sense to decide whether patent law or OI should be used in a specific situation.
- Patent ecosystem: The abolition or suspending of patents with the example of patent ecosystems is discussed as one possibility to bring forward OI.
- OI communities: OI communities are being examined which want to abolish patents.
- Tragedy of anticommons: A tragedy of anticommons has been found, which results from an underuse of inventions because of patents. This effect can adversely affect OI.

- Sequential patents: A sequence of patents can hinder the creation of innovations for example by OI.
- Patent breadth and duration and OI: A high patent breadth and a long patent duration can hinder OI.

Given these considerations and findings, the question arises as to whether OI and patent law can exist simultaneously.

On the other hand, the current scientific research examines how patent law and OI work together or support each other. These topics can be described as follows:

Coexistence of patent law and OI:

- Public knowledge base: Patent registers are used as knowledge base for OI.
- Search for appropriate OI partners: It is described that information on current technical developments can be found on the basis of patent registers. This information can be used, for example, to find suitable partners for OI projects.
- Market place: Patent law can support OI projects by creating a market place for ideas.
- Crowdsourcing for searching prior art: The evaluation of the patentability of patent applications by crowdsourcing is also a topic of the scientific research.
- License out: Licensing as a form of using patent law was analyzed, especially as a way to foster inside-out OI.
- IPR Management because of OI: It was found that OI requires a new type of IPR management.
- Absorptive capacity: It is described that OI should not or cannot replace R&D capabilities, but rather that OI is complementary to own development capabilities.
- Incentive theory: The prospect of patents can stimulate innovation activity. (Keukenschrijver, 2016q Rdn. 68)
- New professions: The concurrence of OI and patent law leads to the emergence of new professions.
- Various examples of coexistence: In the scientific literature additional examples of coexistence are described.

The current scientific research is explained in more detail below:

Controversy between patent law and OI

Fundamental conflict between OI and patent law

Patent law is accused of being guilty of economic distortions.(Burk and Lemley, 2009, p. 3) Already in the sixties of the last century it was described the problem of innovation processes if the knowledge, which is needed for the innovation process, is protected by a patent and the use of the knowledge is forbidden. If patent law produces information bottlenecks there would be a severe encumbrance for the development of technology and progress of social welfare.(Arrow, 1962) Baldwin and von Hippel stated that patent law is not beneficial for social welfare because it hinders potential innovators.(Baldwin and von Hippel, 2011) It can be assumed that such restrictions on the use of ideas can limit especially the applicability of OI.

Therefore, Eric von Hippel sees an antagonism between IPRs, such as patents, and OI. For him the past is „closed“, “IP-protected” and “manufacturer-centered“. He sees the future as „open” and “intellectual property free“. Consequently, he recommends to do without IPRs.(Wilson, 2009)

Especially, a detrimental influence of a patent thicket on knowledge development is assumed. Therefore, proposals were provided to weed out patent thickets and to establish a market place for patents in order to diminish the harmful impact of patent thickets on knowledge production.(Ayres and Parchomovsky, 2007)

Patent law and OI as each excluding alternatives

Even when exercising OI, firms do not share all their knowledge with their OI partners.(Hagedoorn and Zobel, 2015, p. 1056) In R&D collaborations there is a “tension field” of openness and protection of knowledge with patents between the members of the cooperation. It was described, that R&D cooperation projects comprise time periods during which the collaboration with other firms is fostered, wherein there are selected knowledge flows. However, there are also time periods when there is no flow of information.(Bogers, 2011) Therefore, an incompatibility of OI and patent laws was stated.(Hrdy, 2012)

Patent ecosystem

Firms can form patent ecosystems. This means areas of economic activity without restrictions due to intellectual property rights. Patent ecosystems gain importance.(Chien, 2010) Especially, large companies can form or at least spur to create an ecosystem for OI. Particularly by waiving prosecution of patent

infringement an ecosystem can be formed.(Rohrbeck, Hölzle and Gemünden, 2009)

For example, Deutsche Telekom, a former state-run firm, realizes this strategy by creating 'ecosystems'.(Rohrbeck, Hölzle and Gemünden, 2009) Such an ecosystem can work as follows: firms publish a part of their development products, for example software products, but not all of them. There is a selective publication and openness. In doing so the firms can find followers of their products and by keeping secret a part of their products they keep the control over their products. This business strategy was demonstrated with the example of the software industry.(Henkel, 2006)

OI communities

There are OI communities that have altruistic sets of rules with respect to patents. A key point is that patents are used only defensively, i.e. only one's own use of an invention should be protected against a prohibition right from outside. Otherwise, no one is to be deterred from applying the invention.(Schultz and Urban, 2012, pp. 21–26, 37)

Tragedy of anticommons

There is a tragedy of commons, which means, that common goods, for which you have not to pay, are overused. The economic scientific research has found something similar. A tragedy of anticommons has been found, which results from an underuse of inventions because of legal rights such as patents.(Heller and Eisenberg, 1998) There is the finding, that anticommon goods are more prone for underuse than common goods for overuse.(Vanneste *et al.*, 2006)

Possibilities were proposed to solve this problem by assessing the right value of the patents and calculate the appropriate license fees. Especially patent pools can solve the problem of too high transaction costs because of license fees.(Aoki and Schiff, 2008) The existence of patents can therefore prevent the use of inventions protected by patents. This can hinder OI project, since ideas from outside cannot be used.

Sequential patents

Inventions can be cumulative.(Encaoua, Guellec and Martínez, 2003, p. 32) Cumulative means that on previous inventions protected by patents subsequent research will be undertaken, which can lead to additional inventions filed with the patent office. This can lead to a sequence of patents, wherein succeeding patents are based on earlier filed patents. Patents, which comprise preceding patents, are called sequential patents.(Scotchmer, 1991)

Sequential patents follow one after the other and build upon each other. It is important to note that the scope of protection of the later patent in each case is completely covered by the scope of protection of the preceding patent. Such patents are also referred to as dependent patents.(Rinken, 2017f Rdn. 8, 2017d Rdn. 103)

Llanes and Trento analyzed sequences of patents. They found, that sequences of patents are typical for high-tech industries like the electronics industry. They came to the conclusion that sequential patents are detrimental to the technological development.(Llanes and Trento, 2012, pp. 723–724) In this sense, sequential patents can lead to a hurdle for OI projects.

Patent breadth and duration and OI

It was analyzed how the strength of patents affect the knowledge production. (Benkler, 2002) To handle this problem, it was searched for the optimal patent breadth. “The breadth of a patent is defined as the set of products that courts would find to infringe the patent, i.e. products that no other firm can make, sell or use without a license from the patent holder.”(Encaoua, Guellec and Martínez, 2003, p. 20) Encaoua & Lefouili found that patents with large breadth and long duration harm the social welfare. These patents lead to social costs.(Encaoua and Lefouili, 2005, p. 26) OI can also be hindered by such patents.

Coexistence of patent law and OI

Public knowledge base

An important requirement for OI is a “strong public knowledge base”. Such a knowledge base enables OI and fosters the economic growth of the state concerned.(de Jong, Kalvet and Vanhaverbeke, 2010, pp. 880–881) Patent law promotes such a knowledge base because of the obligation to disclose the invention protected by patent law by publication in the patent register.(Boettiger and Burk, 2004, p. 224; Holbrook, 2006; Schäfers, 2015b; Rudloff-Schäffer, 2017b; Visser, 2017, pp. 218–221)

Search for appropriate OI partners

For a successful application of OI it is important to find the necessary external knowledge by an appropriate search.(Laursen and Salter, 2006) According to §32 PatG and article 93 EPC the inventions filed with the patent office will be published.(Rudloff-Schäffer, 2017b; Visser, 2017, pp. 218–221) These publications can be used to collect information about the technical capabilities of the corresponding firms. By this way, partners for an OI project can be found.(Jeon, Lee and Park, 2011; Stadlbauer and Drexler, 2014)

Therefore, patents can be used to demonstrate to other firms the own innovative capabilities. Firms seek and evaluate potential partners for OI projects by evaluating the patent portfolios of these potential partners.(Hagedoorn and Zobel, 2015) In this respect, the means of patent law such as patent registers are used to apply OI.

Market place

Patent law can help to find a suitable invention by creating a market place for inventions.(de Jong *et al.*, 2008)

Crowdsourcing for searching prior art

For the evaluation of novelty and inventive activity of a patent application according to patent law, it is necessary to search for the relevant state of the art. The better the search results are, the more likely it is to prevent low-quality patents. One possibility to enhance the search is to increase the number of persons involved in the search. Crowdsourcing is a way to involve many people in a search for prior art.(Ghafele, Gibert and DiGiammarino, 2011) In this way, OI can improve the well-functioning of the patent system.

License out

Gassmann and Enkel described so-called core processes. They distinguished inside-out, outside-in and coupled processes. These core processes can be seen as different perspectives of OI. The outside-in process is characterized by a flow of external knowledge into the firm. The inside-out process brings own ideas into the market. License out is an example for realizing the inside-out process. A well-known example of the systematic use of the inside-out process by licensing is IBM.(Gassmann and Enkel, 2004, pp. 5–6)

IPR Management because of OI

The change from CI to OI was a shift of paradigm.(Bley, 2010, p. 302) OI is a disruptive innovation itself.(Chesbrough, 2003, p. xx) The advantage of OI is to open the process of innovation, wherein suppliers, customers, other firms and even competitors can be involved to stimulate the generation of new products and processes. It was concluded that new intellectual property management systems have to be developed to keep pace with the development from CI to OI.(Enkel, Gassmann and Chesbrough, 2009, p. 314)

At least the administration of the patents of a firm will be affected by an OI project. Before starting an OI project with a cooperation partner the legal rights of the partner has to be determined. The next step will be to analyze how to

handle these rights. It was found, that firms use contracts to clear this situation.(Hagedoorn and Zobel, 2015)

Absorptive capacity

The assumption that because of OI all steps of the innovation processes are processed outside is wrong. Indeed own technical knowledge is necessary to profit from third party knowledge. It is necessary to balance internal and external R&D activities.(Berchicci, 2013, p. 117) Therefore, a replacement of the own R&D department by OI is not possible.(Ili, 2010) The own firm should have profound technical expertise beyond its own boundaries of production. Only in this case, the firm is able to use outside-in knowledge for realizing OI.(Brusoni, Prencipe and Pavitt, 2001)

Further, it was found that the decision to outsource R&D does not necessary lead to a reduction of the intensity of internal R&D.(Teirlinck, Dumont and Spithoven, 2010) Therefore, there must be always an “absorptive capacity” in order to be able to use OI.(Cohen and Levinthal, 1990; Zahra and George, 2002; Todorova and Durisin, 2007) The own R&D activity can be secured by patents. In this sense, patent law builds a basis on which OI can flourish.

Incentive theory

Patent law is praised as promoting competition and innovation.(Gould and Gruben, 1996, p. 345; Grundmann, 2011, p. 89) Especially because of the incentive theory, it is assumed that the innovative activity, for example by OI, of the national economy will be fostered by patent law.(Keukenschrijver, 2016q Rdn. 68)

Lemley describes that innovations can be independently and simultaneously developed by different teams. This is a hint, that innovations can be obvious and induced by the current status of information, technical knowledge, and the market situation. Therefore, the inventive activity can be stimulated by fear, that the competitors will get an innovation earlier than the own firm and could get a patent, by which the competitors could prevent the own firm from using the technology required by the market.(Lemley, 2012, p. 712) Therefore, patent law could be an efficient way to stimulate innovations, not by rewards as assumed by the incentive theory, but by the fear of third party patents.(Keukenschrijver, 2016q Rdn. 68) Patent law can therefore stimulate to innovate and thus also provide for more innovations from OI projects.

New professions

There are new professional fields of activity because of the coexistence of OI and patent law. For example, there are IP insurers, to protect firms from incalculable risks arising from patents and patent applications.(Gassmann, Enkel and Chesbrough, 2010) Further, there are intellectual property brokers and intermediary services, which provide a constant flow of patent protected ideas.(Wenjuan and Lei, 2010) This supply of ideas can promote OI.

Various examples of coexistence

There are so-called “patent-paper-pairs”, wherein a scientific development, like the “Oncomouse”, will be at the same time protected by a patent and published in a scientific journal. The patent provides economic security for the invention and the publication promotes one's own scientific career.(Murray and Stern, 2007, pp. 649, 683)

Some economists consider a joint R&D cooperation as the right way to harmonize patent law and OI because within the cooperation the firms have access to the information, which is protected by patents.(Ordoover, 1991, p. 55)

In particular, a patent pool allows the companies involved to carry out joint developments of new products through OI, whereby they can use the technical teachings of the patents as a basis for technical development.(Kato, 2004, p. 255; Kim, 2004; Verbeure *et al.*, 2006, p. 115; Lerner and Tirole, 2007, p. 178; van Zimmeren *et al.*, 2011, p. 569; Azetsu and Yamada, 2013, p. 10) This can result in technological standards for an industry.(Layne-Farrar and Lerner, 2011; Lévêque and Ménière, 2011; Gallini, 2014) In this sense, a patent pool leads to a harmonization of OI and patent law.(Aoki & Schiff, 2008).

Further, it was found that starting of a company by an OI project can lead to an increase in patents.(Hagedoorn and Zobel, 2015) In this case OI promotes the application of patent law. This means, that openness results in innovations, which are aimed to be protected by patents.

3.3 ANSWER TO THE SECOND RESEARCH QUESTION

Summarizing the above discussed, it can be stated, that the scientific research takes care of patents, whereby the effects of an OI project on the characteristics of an invention in terms of patent law and the resulting implications thereof are no particularly preferred research object.

Especially, the scientific research did not consider the effects of OI at the level of individual provisions of patent law. Instead, a meta-view is used to gain knowledge about OI in connection with patent law. Therefore, the process of creation of innovations by OI and the consequences because of the properties of OI is up to now not sufficiently examined before the background of patent law.

There is no comprehensive examination of OI in comparison to CI before the background of patent law on basis of the provisions of patent law. As a conclusion, there is a gap of the scientific research.

4 COEXISTENCE OF OI AND PATENT LAW

This chapter clarifies whether OI and patent law can exist simultaneously or whether they are mutually exclusive. If they are not mutually exclusive, coexistence is possible. There is only one single example of coexistence necessary to prove that OI and patent law do not exclude each other because of their mere natures.

4.1 THIRD RESEARCH QUESTION

The third research question is directed to the question, whether OI and patent law can coexist.

Third research question

Is there a fundamental conflict between OI and patent law?

If this research question can be answered positive there is a fundamental conflict between OI and patent law. In this case coexistence of OI and patent law is not possible and one will not be able to find one single example for coexistence of OI and patent law.

The procedure to answer this question is as follows: in a first step, the examples of scientific literature that suggest an incompatibility of OI and patent law are examined. If this examination concludes that there is an incompatibility, the investigation is terminated because compatibility of patent law and OI is excluded.

If instead this first step does not state an absolute incompatibility, the examples of scientific literature that seem to suggest a compatibility of OI and patent law are discussed. Only if this second step of the examination points to compatibility it can be assumed that there is no fundamental contradiction between OI and patent law.

4.2 ASSUMPTION OF EXCLUSION OF OI AND PATENT LAW

There are scientists who are convinced that OI and patent law are incompatible. These people are united in their contempt for patent law.(Hrdy, 2012, pp. 80–81) For example Eric von Hippel sees an antagonism between patents and OI.(Wilson, 2009)

Due to the assumed incompatibility of patent law and OI, it was recommended to make a choice between using OI and patent law. This either-or strategy can be seen in OI projects.(Hagedoorn and Zobel, 2015) Companies typically do not share all their knowledge with R&D partners. Instead, a selective approach is chosen, in which openness is pursued in some phases and seclusion towards R&D partners is pursued in other phases.(Bogers, 2011) A R&D cooperation can be regarded as firm-to-firm OI project.

The problem that patents can prevent innovation projects, such as those of the OI, by virtue of their prohibition rights is well-known. This detrimental effect of patent law was condemned early in the sixties of the last century.(Arrow, 1962)

However, it has also been seen that in most cases there is no absolute prevention of use, but rather an increase in price, as license fees have to be paid for the use of the patented idea, or that only not all market participants are allowed to use the invention, but only the patent owner and the licensees. Therefore, maybe there is a tragedy of anticommons, but there is usually no real prevention of the use of the patented invention.(Heller and Eisenberg, 1998)

The problem of the prohibition rights of patent law or the problem of high license fees can be overcome by a patent pool. In a patent pool, it is possible to use a technology without infringing a patent.(Aoki and Schiff, 2008) There is therefore typically no absolute prohibition on the use of the patented idea. Ultimately, the circle of users is held small.

Frequently, special embodiments of an idea are necessary in order to get a patent. These configurations often result in a peculiar shape and are no fundamental technical progress. It therefore follows that, with special exceptions, such as patents, which describe basic technologies or those which protect standards, there are sufficient possibilities to circumvent a patented idea.(Neuburger, 2005, p. 15; Picht, 2014; EuGH, 2015) The resulting scope of protection of the patent is correspondingly small so that only imitations of the particular shape are legally protected. This does not give rise to any prohibition rights which may extend to a whole market. It is therefore typically not possible to force competitors out of the market for good by means of patents.(Peifer, 2001, pp. 359–365; Asendorf and Schmidt, 2015a; Keukenschrijver, 2016j; Kraßer and Ann, 2016, §18)

Overall, it follows that OI and patent law do not completely exclude each other, but that the application of OI can be just made more difficult or expensive by

patent law. Therefore, it is not possible to state that OI is excluded solely due to the existence of patent law.

4.3 EXAMPLES OF COEXISTENCE

A patent pool can be seen as an example of how patent law and OI can be harmonized. Based on the technology of the patents of the patent pool, technological developments can be driven forward together. A patent pool can therefore result in an OI project. (Ordover, 1991, p. 55; Gallini, 2014)

Further, it was found that OI projects have led to an increase in patents. In particular, the foundation of a company on the basis of an OI project leads to an increased number of patent applications. (Hagedoorn and Zobel, 2015)

A prerequisite for OI to work is a database that can provide third party ideas for the OI project in question. (de Jong, Kalvet and Vanhaverbeke, 2010, p. 880) Patent registers of patent offices can constitute such a database for technical inventions. In this way the patent system helps OI projects.

Patent registers have to be established by the patent offices by law. (Rudloff-Schäffer, 2017b) By the patent registers one can find the companies, which have a high level of expertise in a particular area. Therefore, companies can use the patent registers to find firms, which have the technical know-how they need to develop successfully technically advanced products and methods. Therefore, it is possible to search for partners for an OI project with the help of a patent register. (Jeon, Lee and Park, 2011; Hagedoorn and Zobel, 2015)

Another example of cooperation of OI and patent law is licensing out. Licensing out is an example of the core process inside-out. Inside-out means that an own invention is given to the outside world. This can be done by licensing, whereby the license agreement can be based on a patent. In this sense, patent law enables inside-out OI core processes. (Gassmann and Enkel, 2004, p. 12; Simeth and Raffo, 2013)

The analysis has shown that OI and patent law can coexist at the same time. In fact, there are cases where OI and patent law complement or even support each other.

4.4 ANSWER TO THE THIRD RESEARCH QUESTION

Various examples were discussed which suggest initially that OI and patent law are mutually exclusive. But, it was found finally, that OI and patent law are not mutually exclusive, but that patent law makes it at worst more difficult to apply OI. An example of the fact that OI is actually prevented in principle by patent law could not be found. Instead, several examples have been found showing that OI and patent law can coexist. There are even cases where patent law promotes OI projects.

The examples discussed falsify the assumption that OI and patent law are fundamentally incompatible. Therefore, there is no general controversy between OI and patent law. Patent law does not exclude OI and the other way round not either. But, there is not always a perfect harmony between both and patent law and OI do not fit properly in every possible situation.

5 TOUCHPOINTS BETWEEN OI AND PATENT LAW

OI and patent law form part of different realms. Patent law belongs to the legal world and OI summarizes different measures as a concept for creating innovations. (Chesbrough, 2003, p. 43) Therefore, it is important to identify the connection between both. Only if the touchpoints between patent law and OI can be determined, an assessment of OI against the background of patent law is possible.

5.1 FOURTH RESEARCH QUESTION

The touchpoints between OI and patent law have to be found.

Fourth research question

What are the touchpoints between OI and patent law?

Which is the “bridge” between both? OI is settled within one realm and patent law belongs to another. But, there may be a connection between both.

The result of OI is an innovation, which can be a technical or economic progress. (Hauschildt, 2004, p. 7) Patent law is only concerned about technological progress. The technological progress is called an invention in terms of patent law. (Moufang, 2017a Rdn. 15) Therefore, OI as well as patent law are concerned about progress.

5.2 POSSIBILITIES OF TOUCHPOINTS

There are three possible contact points between OI and patent law. On the one hand, OI results in innovations that may need to be protected by patent law. How does the OI innovation method affect the patentability of a resulting innovation? In this context, for example, novelty, inventive activity and inventorship can be examined from the perspective of patent law. (Keukenschrijver, 2016g, 2016j; Kraßer and Ann, 2016, §§17 and 18; Moufang, 2017b, 2017g) Therefore, the patentability of innovations according to OI is asked.

On the other hand, it is necessary to investigate the influence of the patent law's prohibition rights on an innovation process. The question also arises as to what significance it has, that a special innovation method has been used. Is there a different effect of the prohibition rights on the respective innovation, because of the innovation method chosen?(Keukenschrijver, 2016o, 2016c; Kraßer and Ann, 2016, §§31 and 32; Rincken, 2017f, 2017a)

Thirdly, the importance of the legal instrument of unlawful removal for the innovation method chosen and the resulting innovation must be examined.(Keukenschrijver, 2016n; Moufang, 2017n)

5.3 OI AND PATENTABILITY

The first touchpoint deals with the patentability of innovations. Innovations result from an OI process and can basically be patentable. Patent law is not concerned with innovations, but with inventions. It is therefore necessary that an innovation according to OI is an invention according to patent law for patent law to be applicable at all.(Bacher, 2015 Rdn. 40)

5.3.1 Invention as subject matter of patent law

First of all, it has to be clarified what the subject matter of patent law is. What is patent law all about? The figure 5 shows the basic structure of German patent law. An inventor creates an invention, which is then subject to a grant procedure and can mature into a patent. Patent law therefore deals with inventions.(Moufang, 2017a Rdn. 14-15)

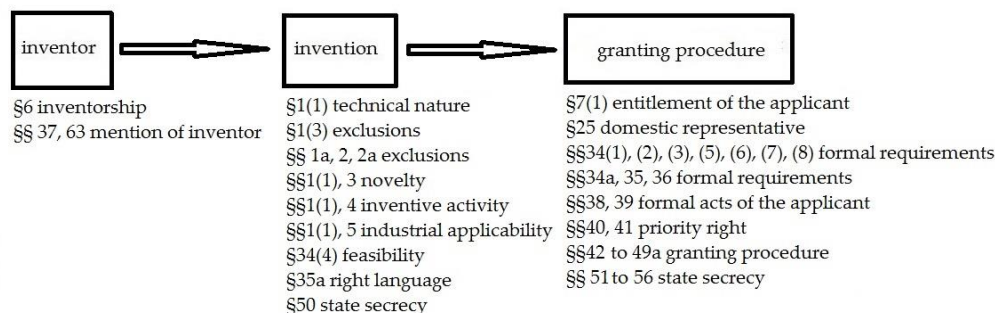


Figure 5: Basic structure of patent law

5.3.2 Innovation as subject matter of OI

OI is a method for generating innovations. The figure 6 shows the method with an external step, which depicts the characteristic openness of the OI innovation process. OI therefore deals with innovations and especially is aimed to create innovations.(Hauschildt, 2004, p. 7)

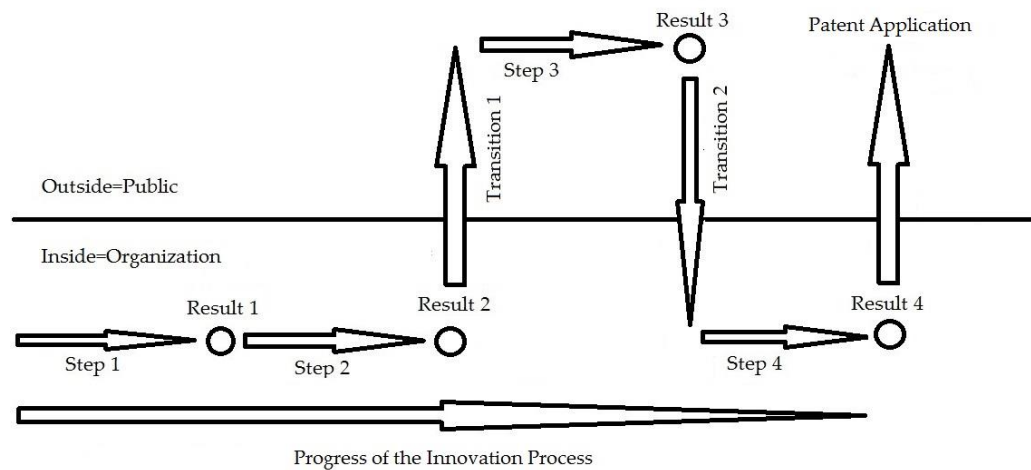


Figure 6: Basic situation of OI

5.3.3 Connection between invention and innovation

One relationship between OI and patent law is established by the innovation-invention interface. Therefore, the terms innovation and invention are examined and compared in order to understand this interface.

OI and patent law are not concerned with the same subject matter. Patent law is concerned with the method for granting a patent. Further, patent law describes the rights derived from an invention.(Rinken, 2017f, 2017a)

OI describes a method for creating an innovation. By applying OI an innovation can be generated. An innovation is an advantageous development, which is aimed to enhance the economic success of a firm.(Hauschildt, 2004, p. 7)

One can assume that the mere nature of the innovation process determines the characteristics of the resulting innovation. There should be expected different properties of the innovation depending on the innovation method applied. Especially, one should assume different characteristics if the innovation is the

result of an OI instead of a CI innovation project. These different characteristics may influence the granting process according to patent law.(Moufang, 2017a Rdn. 14-17)

An innovation represents the result of an innovation process, wherein the innovation process can be an innovation process according to OI or CI. An invention can also be interpreted as the result of an innovation process. But, an invention in terms of patent law is restricted to particular areas of human knowledge. There are economic areas whose innovations cannot be protected by a patent, because an invention must have a technical character. Therefore, for example, business models or mathematical formulas cannot be granted as patents because of lack of technical character.(Kraßer and Ann, 2016, §12 Rdn. 1)

Further, there can be innovations, which were produced automatically without having a human origin. These innovations do not have a human inventor. Such innovations are not consistent with the inventor's principle due to §6 PatG and article 60 EPC.(Moufang, 2017l; Visser, 2017, pp. 129–131) Therefore, these innovations are not regarded as inventions in terms of patent law.(Deutsches Patentamt, 1951; Meitinger, 2017d, p. 149)

An invention due to patent law is defined as:

Invention

An invention is a technical teaching, which is the achievement of one or several human beings.

The features of an invention are:

- Technical nature: The invention must have a technical character. Patent law describes examples of what is not to be understood as technical in the sense of patent law. For example mathematical methods, games, plans for business activities, for example a new business model and software is not considered technically. Services are also not regarded as being technical due to patent law.(Kraßer and Ann, 2016, §12 Rdn.13-20)
- Teaching: An invention must be a guide to the realization of a result.(Bacher, 2015 Rdn. 45-45c; Moufang, 2017a Rdn. 15)
- One human being: The invention must be the result of a human being.(Deutsches Patentamt, 1951; Kraßer and Ann, 2016, §11 Rdn. 4; Meitinger, 2017d, p. 149)
- Several human beings: The invention may be created by a community of inventors with a random number of inventors.(Kraßer and Ann, 2016, §19 Rdn. 49; Moufang, 2017l Rdn. 20)

- An invention does not have to be new or based on an inventive activity.(Bacher, 2015 Rdn. 40; Moufang, 2017a Rdn. 15)
- The invention must be a product or a process. A service is not patentable due to §1(3) No. 3 PatG.(Bacher, 2015 Rdn. 46; Moufang, 2017a Rdn. 17)

On the other hand, OI is concerned about creating or amending a product, a process or a service to increase the economic success of a firm. This new or at least amended product, process or service is called an innovation.

An innovation in terms of OI is defined as:

Innovation

An innovation is the result of an innovation process, wherein the innovation can be a product, process, service or other kind of economical object, and which is with some regard new.

The features of an innovation are:

- created by an innovation process,
- product, process, service or other kind of economical object and
- with some regard new.

The characteristics of an invention and an innovation are listed in the table 1.

Table 1: Features of innovations versus inventions

Feature	Innovation	Invention
technical nature	can be	must be
teaching	yes	yes
created by a human being	can be	must be
created by several human beings	can be	can be
innovation process	must be	can be
product, process	can be	yes
service or other kind of economical object	can be	no
with some regard new	yes	can be

The table 1 shows the different characteristics of an invention and an innovation. The table shows that the characteristics of an innovation and an invention are not mutually exclusive from the outset.

No invention can result from the property “service or other kind of economical object” of an innovation, because an invention in terms of patent law must have a technical character. However, this property is only an alternative. If one of the other alternatives “product, process” besides the property “service or other kind of economical object” is chosen, an innovation can be an invention. Further, unlike an innovation, an invention must come from a human being. There are therefore innovations that are inventions and innovations that are not considered inventions in the sense of patent law.(Kraßer and Ann, 2016, § 11)

In contrary to an innovation it is not a precondition of an invention to be novel.(Bacher, 2015 Rdn. 40) For this reason, there are inventions in terms of patent law, which are not innovations. However, the invention must be of an absolute novelty in order to be patentable at all.(Moufang, 2017b Rdn. 8) For an innovation, it is sufficient to be new in terms of any reference. It is for example sufficient if the innovation is novel for the participants of a market segment.(Garcia and Calantone, 2002) The innovation-invention-relationship will be examined in the chapters 6, 7 and 8.

5.4 OI AND PROHIBITION RIGHTS

The prohibition rights under patent law can be taken to prevent the use of innovations. Therefore, the use of innovations of OI can also be prevented. The prohibition rights under patent law are therefore one way in which patent law and OI can interact.(Scharen, 2015) Further, the prohibition rights of patent law can in principle have an impact on the innovation process itself.(Rinken, 2017f) It will be clarified in chapter 9 whether innovations according to OI or CI behave differently with regard to the effect of the prohibition rights.

5.5 OI AND UNLAWFUL REMOVAL

In an OI project an external invention can be incorporated from outside the organization into the own innovation. If a patent application, based on the innovation, is filed with an patent office an unlawful removal may result.(Melullis, 2015c Rdn. 2) It is therefore also necessary to examine the influence of the provisions of the legal instrument of unlawful extraction with regard to the innovation method and the resulting innovation. This examination is carried out in chapter 10.

5.6 ANSWER TO THE FOURTH RESEARCH QUESTION

OI can be regarded as a preceding phase, which results in an innovation. Then patent law can be a succeeding phase, wherein patent law comprises methods, which are applied to the innovation of OI, in case the innovation is an invention. Therefore, there is an innovation-invention-relationship as interface between OI and patent law, which can result in patents, if the requirements of patent law are fulfilled.(Kraßer and Ann, 2016, §§16-18)

This invention-innovation-relationship will be examined in detail in order to understand which kind of innovation method can lead to patents after a granting process of the patent law.(Kraßer and Ann, 2016, §23 Rdn. 7) This examination is carried out in chapters 6, 7 and 8.

A further interaction between OI and patent law can result from the prohibition rights of patent law. The prohibition rights may affect the innovation process or the resulting innovation of the innovation process. Here, it must be examined how the differences between the innovation methods lead to a different influence of the prohibition rights on the innovation process and on the resulting innovation.(Kraßer and Ann, 2016, §31) This examination will be carried out in chapter 9. A third possibility of interaction between OI and patent law may result from the legal instrument of unlawful removal.(Melullis, 2015c) This examination is carried out in chapter 10.

As a result, there are three possible interactions between OI and patent law. On the one hand, OI can lead to innovations that result in inventions under patent law. On the other hand, effects of patent law on OI can result from the prohibition rights and the legal instrument of unlawful removal.

6 PROPERTIES OF AN INVENTION

The findings up to this chapter are as follows: OI and patent law can be compatible. They do not exclude each other per se. Further, a first interaction between both results from the innovation-invention-relationship. Secondly, further interaction possibilities between OI and patent law result from the prohibition rights of patent law and the legal instrument of unlawful extraction. In order to examine the first possibility of interaction the properties of an invention resulting from patent law must be determined.(Bacher, 2015 Rdn. 40)

Only those characteristics of an invention are determined which control the effect of patent law. Features of an invention that constitute a prerequisite for an invention are not taken into account. These characteristics do not influence the way patent law works, but determine whether patent law is relevant at all.

First structure of patent law

The question is which provisions of patent law are relevant. It can be assumed, that patent law comprises important and less important rules from the standpoint of an invention. There will be rules that define the properties of an invention. There will also be rules that will be applied differently depending on the values of these properties. The properties will control the application of these rules. These patent law rules are important from the perspective of OI's relationship to patent law. There will also be rules dealing with the internal affairs of the patent office or a court. The latter provisions can most likely be neglected.(Kraßer and Ann, 2016, §23)

Patent law therefore comprises two types of relevant regulations, namely rules for evaluating an invention(Kraßer and Ann, 2016, §10) and rules governing the grant of a patent with respect to this invention.(Kraßer and Ann, 2016, §22)

The filtering out of non-relevant rules of patent law takes place in two steps. In a first step, patent law is described as a life cycle of an invention from the filing to the granting as a patent.(Kraßer and Ann, 2016, §25) It is assumed that the rules relating to the time after the grant of the patent have no influence on the grant of the patent or the invention itself. These regulations must be for the most part of administrative nature and can therefore be ignored.

But, it must be kept in mind that after the patent has been granted, there may be still rules, which are not of administrative nature. These rules are concerned in

particular with the abolition or restriction of the corresponding patent.(Kraßer and Ann, 2016, §22 Rdn. 65-76)

These rules can also be controlled by the characteristics of the invention. Therefore these provisions are basically relevant. However, these are regulations which are intended to correct errors in the grant procedure, for example because the novelty or inventive step was not correctly assessed before the state of the art.(Rogge and Kober-Dehm, 2015 Rdn. 17; Schäfers and Schwarz, 2015a Rdn. 174-183; Engels, 2016; Keukenschrijver, 2016e Rdn. 20-25; Moufang, 2017k Rdn. 94-128, 131) This thesis assumes that such shortcomings do not occur. Provisions relating to the possible loss of a patent due to inadequate application of provisions in the grant of the patent are therefore not considered.

Furthermore, after the grant of the own patent the invention by OI may be affected by the prohibition rights of patent law or by the legal instrument of unlawful extraction.(Melullis, 2015c; Scharen, 2015; Keukenschrijver, 2016n, 2016o) These two cases are dealt with in chapters 9 and 10.

Second structure of patent law

In a second step, further regulations of an administrative nature are sorted out. Elements of the software technology are used for this purpose, whereby the patent law is divided into functions, objects and properties of objects in the same way as a software program. The relevant object of patent law is the invention. The functions can assign properties to the inventions. There are also functions that assign values to the properties of the inventions. In this way, the importance of any regulation concerning the object invention becomes clear. Provisions that do not define any properties or values of properties are sorted out as irrelevant. In the end, all provisions that determine the characteristics of an invention arise and thus all characteristics of an invention that result from the patent law will be found.

6.1 FIFTH RESEARCH QUESTION

One interface between OI and patent law is the relationship between innovation of the OI project and invention according to patent law. This interaction results from the fact that innovations from OI can lead to inventions due to patent law. If one examines the characteristics of inventions that they must have in order to be patentable, it can be determined in a next step which type of innovation method can lead to patentable innovations. Therefore, the properties of an invention according to patent law have to be found.

Fifth research question

Which are the properties of an invention due to patent law?

6.2 FIRST STRUCTURE OF PATENT LAW

A first structure of patent law can be derived from the life cycle of an invention from filing to granting as patent. The patent law comprises the rules to granting a patent.(Kraßer and Ann, 2016, §25)

6.2.1 PatG

The figures 7 to 9 show the sequence of an invention due to German patent law, whereby an inventor creates an invention, which is then subject to a granting procedure in order to obtain a patent, if possible. Based on this life cycle of an invention, the PatG can be structured.

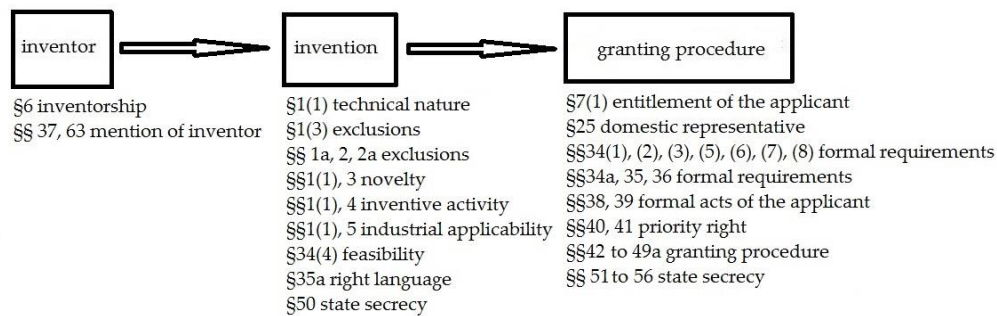


Figure 7: Structure PatG part 1

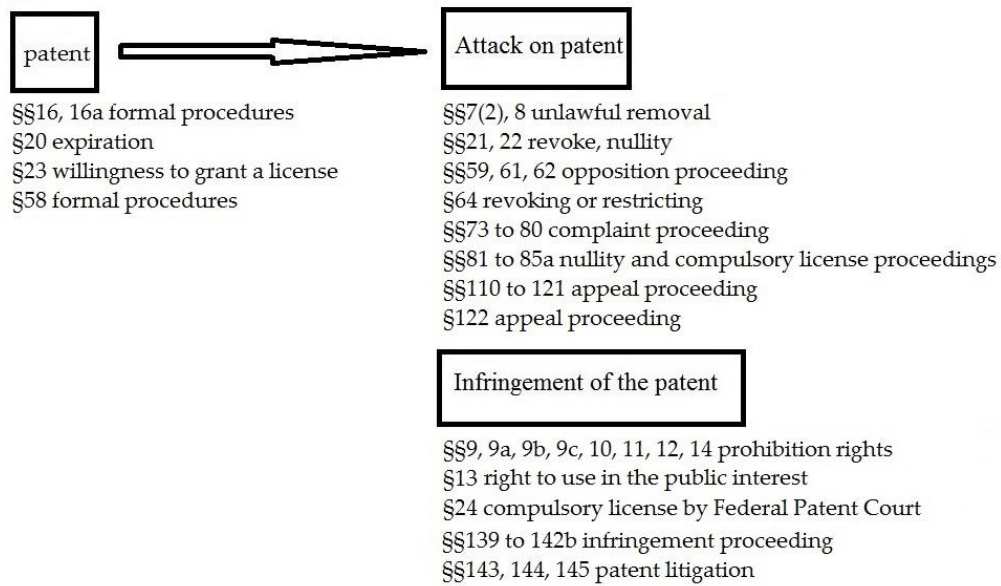


Figure 8: Structure PatG part 2

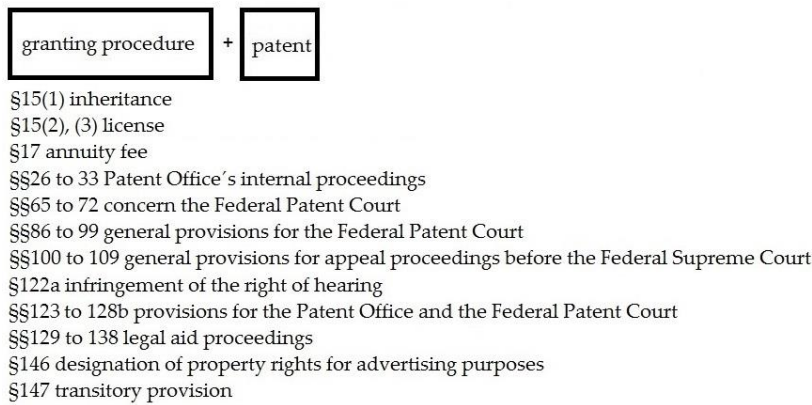


Figure 9: Structure PatG part 3

The paragraphs of the PatG are assigned to the individual sections of the life cycle of an invention:

Inventor

The inventor is the origin of the invention. The inventor creates the invention. Patent law assigns all rights of the invention to the inventor. (Kraßer and Ann, 2016, §19 Rdn. 1-2)

§6 sentences 1 and 3 PatG describe the rights of an inventor. Same for a community of inventors by §6 sentence 2 PatG.

§37 PatG determines that the inventors have to be mentioned.

§63 PatG describes the procedure of mentioning of the inventors.

Invention

The invention is the subject matter of patent law. The invention can be patented if it has a technical character and fulfils the other conditions of patent law. The invention represents a teaching for planned action in which the laws of nature are used. (Kraßer and Ann, 2016, §11 Rdn. 1-3)

§1(1) PatG describes essential conditions that an invention must meet in order to be patentable. This includes that the invention is a technical teaching, new, based on an inventive activity and industrially applicable.

§§1(3), 1a, 2 and 2a PatG describe special exclusion criteria. If these are met, it is not possible to grant a patent.

§§1(1) and 3 PatG describe the concept of novelty in patent law.

§§1(1) and 4 PatG: According to patent law, it is not possible to grant a patent for every new invention. A special requirement that goes beyond the normal activity of a person skilled in the art has also to be fulfilled. For this reason, §4 PatG stipulates that patents can only be granted for non-obvious inventions.

§§1(1) and 5 PatG: These paragraphs state that an invention must be susceptible of industrial application. Otherwise patentability is excluded.

§34(4) PatG defines the requirement of feasibility of an invention.

§35a PatG defines the right language of the patent application.

§50 PatG describes the property of an invention of being a state secrecy.

Granting procedure

The patent law comprises rules for granting inventions as patents. An invention is examined for patent worthiness by the patent office in the course of the grant procedure. (Kraßer and Ann, 2016, §25)

§7(1) PatG defines that the patent office initially assumes that the applicant is entitled to file the invention as his patent application.

§25 PatG describes the need to appoint a domestic representative if the applicant has no domicile in Germany.

§§34(1), (2), (3), (5), (6), (7), (8), 34a, 35 and 36 PatG describe formal requirements of a patent application.

§§34a, 35 and 36 describe formal requirements.

§§38 and 39 PatG describe possible formal acts of the applicant.

§§40 and 41 PatG determine the priority right.

§§42 to 49a PatG describe formal procedures concerning patent applications.

§§51 to 56 PatG define provisions for proceeding of a patent application with an invention which constitutes a state secret.

Patent

The patent law comprises paragraphs which do not relate to the invention or the patent application. In particular, these paragraphs deal with proceedings relating to the patent, such as opposition or invalidity proceedings.

§§16 and 16a PatG describe formal procedures.

§20 PatG determine the expiry of a patent.

§23 PatG describes the willingness to grant a license. A license can be acquired from a patent or a patent application. However, it makes more sense to acquire a license from a patent than from a patent application, as a patent application does not give rise to any prohibition rights. §23 PatG is therefore assigned to the category "patent".

§58 PatG determines procedures after granting a patent.

Attack on patent

§§7(2) and 8 PatG define the legal instrument of unlawful removal.

The §§21 and 22 PatG determine when a patent expires or is revoked.

§§59, 61 and 62 PatG describe the proceedings of an opposition against a patent.

§64 PatG describes procedures for revoking or restricting a patent which the applicant can initiate himself.

§§73 to 80 PatG describe the complaint procedures.

§§81 to 85a PatG deal with the nullity proceeding. Further, these provisions are concerned with proceedings against compulsory licences. Nullity proceedings only concern patents. Compulsory licensing proceedings can be conducted because of patents or patent applications.

§§110 to 121 PatG contain the provisions on appeal proceedings before the Federal Supreme Court following nullity proceedings of the Federal Patent Court.

§122 PatG describes an appeal proceeding against a decision of the Federal Patent Court because of a compulsory license.

Infringement of a patent

§§9, 9a, 9b, 9c, 10, 11, 12, 14 PatG describe the prohibition rights.

§13 PatG defines the right to use in the public interest granted by the Federal Government.

§24 PatG deals with compulsory licenses, which are ordered by the Federal Patent Court.

§§139 to 142b PatG determine the legal consequences of infringement of a patented invention. These provisions define the application of the prohibition rights.

§§143, 144 and 145 PatG describe the proceedings in patent litigations.

Granting procedure and patent

There are paragraphs of the patent act that relate to both the grant procedure and the patent.

§15(1) PatG describes the inheritance of an invention and the possibility of transferring an invention.

§15(2) and (3) PatG define licenses for inventions.

§17 determines that for every patent application and patent annuity fees have to be paid.

§§26 to 33 PatG describe the Patent Office's internal affairs.

§§65 to 72 PatG are concerned with the Federal Patent Court, in particular its staff.

§§86 to 99 PatG comprise general provisions for the Federal Patent Court.

§§100 to 109 PatG contain provisions for the appeal proceedings before the Federal Supreme Court.

§122a PatG describes a provision because of violation of the right of hearing.

§§123 to 128b PatG contain common rules for the Patent Office and the Federal Patent Court.

§§129 to 138 PatG regulate the legal aid for proceedings before the Patent Office, the Federal Patent Court and the Federal Supreme Court.

§146 PatG deals with the designation of property rights for advertising purposes.

§§147 PatG includes transitional provisions.

6.2.2 EPC

The EPC is structured in twelve parts, wherein the eleventh part is deleted completely.

Part I:

The first part of the EPC deals with general and institutional regulations, in particular the organization of the EPO, the administrative council and financial provisions.(EPO, 2016, pp. 44–107; Visser, 2017, p. 2)

The articles 5 to 9 EPC describe the legal status, headquarters, sub-offices of the EPO, privileges, immunities and liability of the EPO.(Visser, 2017, pp. 12–15)

Articles 10 to 25 describe the management, the appointment of senior employees, the duties of the office, the disputes between the EPO and the employees of the EPO, the languages of the EPO, the European patent applications and other documents, the departments entrusted with the procedure, the receiving section, the search divisions, the examining divisions, the opposition divisions, the legal division, the boards of appeal, the enlarged board of appeal, the independence of the members of the boards, exclusion, objection and technical opinion.(Visser, 2017, pp. 16–40)

Articles 26 to 36 EPC are concerned with membership, chairmanship, board, meetings, attendance of observers, languages of the administrative council, staff, premises, equipment, competence of the administrative council in certain cases, voting rights and weighting of votes.(Visser, 2017, pp. 41–47)

Articles 37 to 51 EPC describe budgetary funding, the organization's own resources, payments by the contracting states in respect of renewal fees for European patents, level of fees and payments, special financial contributions, advances, budget, authorization for expenditure, appropriations for unforeseeable expenditure, accounting period, preparation and adoption of the budget, provisional budget, budget implementation, auditing of accounts, financial regulations and fees.(EPO, 2016, pp. 44–107; Visser, 2017, pp. 48–54)

Part II:

The second part of the EPC is concerned with the substantive patent law. The first chapter of the second part deals with the patentability and the second chapter with the persons entitled to apply for and obtain a European patent and the mention of the inventors.(Visser, 2017, pp. 2–3)

The third chapter of Part II of EPC defines the effects of the European patent and the European patent application.(EPO, 2016, pp. 108–135) The fourth chapter describes the European patent application as an object of property.(Visser, 2017, pp. 152–155)

Part III:

This part specifies the filing and requirements of a patent application and the right of priority.(EPO, 2016, pp. 136–151)

Part IV:

This part determines the procedure up to grant a patent.(EPO, 2016, pp. 152–161)

Part V:

In this part, the opposition to a patent and the limitation procedure are determined.(EPO, 2016, pp. 162–173)

Part VI:

The sixth part deals with the appeal proceedings.(EPO, 2016, pp. 174–183)

Part VII:

This part deals with common provisions, information to the public and to official bodies and the representation of applicants before the EPO.(EPO, 2016, pp. 184–215)

Part VIII:

Part VIII describes the link to the respective national law.(EPO, 2016, pp. 216–225)

Part IX:

This part provides special agreements.(EPO, 2016, pp. 226–235)

Part X:

Part X determines the relationship between the EPC and the Patent Cooperation Treaty (PCT).(EPO, 2016, pp. 236–245)

Part XII:

This part contains final provisions.(EPO, 2016, pp. 248–265)

The EPC will be structured in the same way as the PatG with the help of the figures 10 to 12:

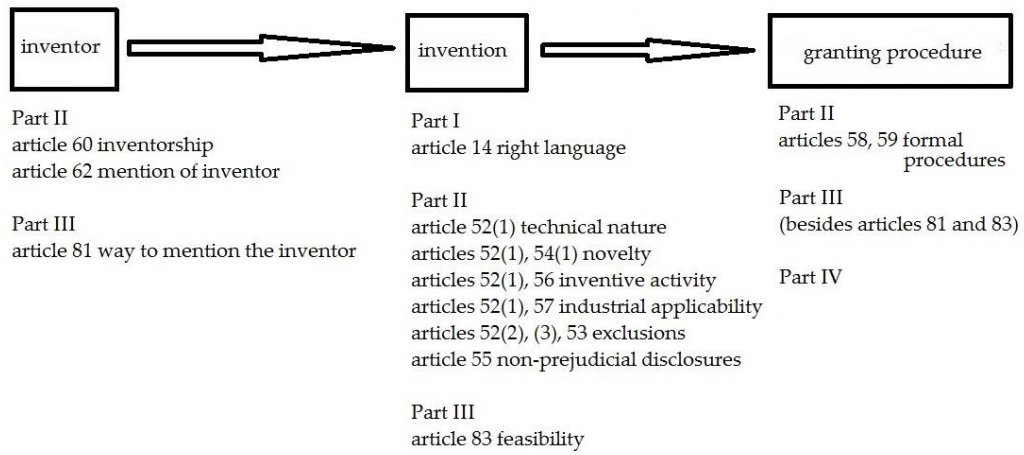


Figure 10: Structure EPC part 1

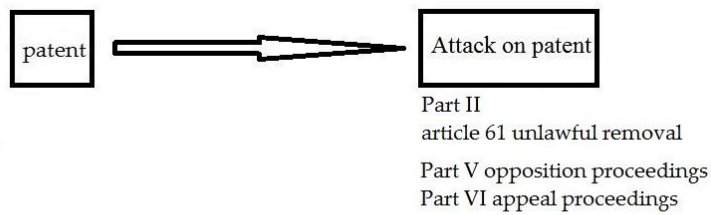


Figure 11: Structure EPC part 2



- Part I general and institutional regulations (besides article 14)
- Part II
- articles 63 to 74 formal procedures
- Part VII common provisions on the distribution of information and similar formal proceedings
- Part VIII link to national law
- Part IX special agreements
- Part X relationship between EPC and PCT
- Part XII formal provisions

Figure 12: Structure EPC part 3

The specification of the parts of the EPC in the figures should be understood as indicating first which part of the EPC is assigned to the section of the life cycle of an invention. If one or more articles of this part of the EPC are listed, only those articles are assigned to the relevant section. If no article is mentioned for the part, all articles of this part are to be assigned to the section. "Part I article 14 right language" therefore means that only article 14 of Part I is to be assigned to the section concerned. "Part IV" means that all articles of part IV of EPC are to be assigned to the corresponding section.

There is no section "infringement" of the life cycle of an invention because due to article 64(3) EPC an infringement of a European patent will be treated under national law. There are therefore no EPC regulations necessary.

The articles of the EPC are assigned to the individual sections of the life cycle of an invention:

Inventor

The inventor is the origin of the invention. He is entitled to all rights to the invention. (Kraßer and Ann, 2016, §19)

Article 60 EPC: This article stipulates that the inventor shall have the right to the patent in question.

Article 62 EPC deals with the right of an inventor to be mentioned.

Article 81 EPC defines the correct manner to mention the inventor.

Invention

The invention is the subject matter of patent law. (Kraßer and Ann, 2016, §11)

Article 14 EPC defines the right language of an invention.

Article 52(1) EPC: This article determines that an invention must be on a technical field, novel, based on an inventive activity and susceptible of industrial application.

Articles 52(1) and 54(1) EPC: These articles describe the characteristic of novelty of an invention.

Articles 52(1) and 56 EPC: The characteristic of inventive activity of an invention is defined.

Articles 52(1) and 57 EPC: These articles determine the property of being susceptible of industrial application of an invention.

Articles 52(2), (3) and 53 EPC describe what is not regarded as an invention.

Article 55 EPC: By this article non-prejudicial disclosures are defined.

Article 83 EPC describes the feasibility of an invention.

Granting procedure

The grant procedure is an examination procedure in which the patent office examines whether or in what form a patent can be granted. (Kraßer and Ann, 2016, §25)

Articles 58 and 59 EPC: These articles deal with formal procedures.

The Parts III and IV are concerned with the grant procedure. The articles 81 and 83 EPC are exceptions, because these provisions define properties of an invention.

Patent

The EPC provides a common procedure for granting patents in the member states of the EPC. After termination of the grant procedure, the European patents constitute fully-fledged national patents to which the respective national rights apply. Therefore, it is not necessary that there are regulations for patents of the EPC after opposition proceedings as patents are governed by national law. (Visser, 2017, pp. 138–140)

Attack on patent

A patent can be destroyed by an opposition proceeding. Further, a patent may be limited, for example, if a new prior art has emerged which calls into question the existing patent and its scope of protection. By limiting the scope of protection, the validity of the patent can be restored. (Kraßer and Ann, 2016, §26 Rdn. 121-252)

Article 61 EPC: This article describes the legal instrument of unlawful removal.

Part V deals with procedures, which concern an opposition and a limitation of the scope of protection of a patent.

Part VI deals with appeal proceedings.

Granting procedure and patent

The whole part I with the general and institutional provisions concerns the grant procedure as well as the patent phase. An exception is the article 14 EPC which deals with a property of the invention concerned.

Articles 63 to 74 EPC: These articles describe formal procedures.

The provisions of parts VII, VIII, IX, X and XII deal with patent applications as well as patents.

6.2.3 Result

Paragraphs and articles of patent law which are only relevant after the granting procedure cannot influence the suitability of an invention for patenting. For this reason, all these provisions can be disregarded for this thesis. It is therefore possible to concentrate on the remaining provisions.

As a first result, the provisions concerning the phase “patent”, “attack on patent” and “infringement of the patent” can be disregarded. Therefore, the following paragraphs of PatG can be neglected:

Patent

- §§16, 16a,
- §20,
- §23 and
- §58.

Attack on patent

- §§7(2), 8,
- §§21 and 22,
- §§59, 61 and 62,
- §64,
- §§73 to 80,
- §§81 to 85a,
- §§110 to 121 and
- §122.

Infringement of the patent

- §§9, 9a, 9b, 9c, 10, 11, 12, 14,
- §13,
- §24,
- §§139 to 142b,
- §§143, 144 and 145.

The same applies on EPC: the provisions concerned with “attack on patent” can be neglected. Therefore, the following articles of EPC can be disregarded:

Attack on patent

- article 61 EPC
- all articles of Part V and
- all articles of Part VI.

This structuring has therefore resulted in a considerable number of provisions, which do not have to be examined.

6.3 SECOND STRUCTURE OF PATENT LAW

A law is due to the complexity of language sometimes difficult to apply. (Sunstein, 2018, p. X, Preface) Therefore, a method is searched to illustrate the structure of the patent law in such a way and detail, that the fifth research question can be answered finally.

Especially, a method has to be found to distinguish the single elements of the patent law and to represent the relationship between these elements. A clear structure can be established by applying the structure due to a computer program. Therefore, the legal text of patent law will be converted into a structure like a computer program. (Jordan and Urban, 1978, p. 16)

A computer program is structured as follows: there is input data and a rule, which deals with this input data, whereby an output data is resulting. A legal provision can be seen in a similar way, because provisions of a law are rules, which are adapted on real-life situations. Therefore, there are rules and input data, which are applied to assess the situation to be decided. Further, the legal decision is the output data. (Jordan and Urban, 1978, p. 16) Therefore, structures like computer programs can be used to show the structure of the provisions of patent law.

6.3.1 State of the scientific research

There are already approaches to apply findings of computer science on legal texts. Efforts were undertaken to transform law directly into a software code for computers. The direct transformation of a law into computer code is called "legal engineering". (Nakamura, Nobuoka and Shimazu, 2007)

An important part of the work of a lawyer is to justify that a provision of a law can be applied on a concrete daily life situation. It is only in this case that the legal consequences arise. The attempt to apply computer science on this method is called "legal reasoning". (Buchanan and Headrick, 1970)

Smart contracts represent a further application of IT technologies on law science. They are contractual agreements that are enforced by IT technologies. Smart contracts could also be used to implement legal regulations. For example, legal deadlines could be monitored. (Meitinger, 2017f)

The application of IT technologies on law science is therefore not new. It is justified to apply IT technologies on patent law for the purposes of the thesis also. First of all, the three different ways of application will be discussed, namely legal engineering, legal reasoning and smart contracts.

Legal Engineering

Legal engineering is a branch of computer science that translates legal texts into a formalized language that could be directly transformed into a computer program. The aim is to examine the consistency and completeness of a law by means of the formalized translation, as well as to ensure their non-contradiction to other laws. (Nakamura, Nobuoka and Shimazu, 2007; Nakamura *et al.*, 2010)

Legal Reasoning

The science of legal reasoning deals with the legal argumentation, in particular the problem of the applicability of precedents in the Anglo-American case law.

Already very early, attempts were made to automate legal reasoning using artificial intelligence.(Buchanan and Headrick, 1970)

An example of legal reasoning is to clarify the question of what an invention is in the sense of patent law. The patent law itself does not define the term invention. Instead, the jurisprudence must be consulted. The decision as to whether an object has a technical character and therefore constitutes an invention within the meaning of the patent law can only be answered in an argumentative manner. This is a typical problem, which can be solved by legal reasoning with the help of artificial intelligence.(Ashley and Rissland, 2003; Bench-Capon and Sartor, 2003)

Smart contracts

Smart contracts are legal agreements, wherein the agreements are automatically enforced by IT technologies. In the case of an autonomous enforceability, a fundamental prerequisite is that the contracting parties may have confidence in the correct implementation of the rules of the contract. To guarantee this aspect, the blockchain technology is used.(Glatz, 2016; Meitinger, 2017f)

Blockchains are regarded as „the next big thing“.(The Economist, 2015) A blockchain is a sequence of data sets, which can be considered as a stack. The characteristic of a blockchain is that it is only possible to put on one more attachment to the stack. It is not possible to change the already existing parts of the blockchain. A well-known application of a blockchain is Bitcoin, which is a virtual currency.(Hildner, 2016; Plitt and Fischer, 2016) Smart contracts which apply the technology of blockchains could be used to implement legal regulations.(Fries, 2016; MMR-Aktuell, 2016)

In particular, it has been shown that smart contracts could be used to implement the patent law. A scenario was described in which a smart contract autonomously takes over the administration of a patent or a patent application. In this case, the smart contract will ensure that the annual fees are paid in due time. The work of patent attorneys would be limited to the drafting of patent applications and representation before the courts of justice. Formal tasks of a law firm, such as regarding deadlines, will be taken over by the smart contracts. Also, the patent offices could concentrate on substantial work, in particular evaluating the patentability of an invention. Monitoring and control of the formal requirements of patent law would no longer be necessary. The smart contract concerned could also take over these tasks.(Meitinger, 2017f) It was also discussed that smart contracts might even replace patents.(Swan, 2015, p. 11)

6.3.2 Elements of a computer program

A computer program can be divided into input data, functions and output data, wherein the functions work with input data to produce the output data. There is a clear concept of processing.(Dworatschek, 1989, p. 47) The input data and the output data can be seen as objects, which have properties. The properties can have different values, for example a range of values.

Therefore, a computer program comprises(Pimparkhede, 2017, pp. 533–651)

- objects,
- properties of the objects, wherein the properties have
- values.

There are functions for managing these objects, properties and values of the properties. Therefore, there are the functions as follows (Davis, 2015, pp. 129–140; Pimparkhede, 2017, pp. 299–370):

- functions for assigning properties to objects and
- functions for assigning values to these properties of the objects.

A computer program therefore has a clear structure. Such a distinct structure can be applied on the patent law in order to structure it also clearly.

6.3.3 Patent law as a computer program

Patent law comprises a set of rules, wherein the life cycle from an invention to a patent is described. These rules are controlled by the characteristics of the invention. For example, if an invention is not new, it is clear due to §1(1) PatG that a patent cannot be granted. The characteristics of an innovation generated by an innovation method chosen can therefore influence the application of the rules of patent law.(Kraßer and Ann, 2016, §25) It may be possible that the rules of patent law apply differently depending on the type of innovation method used to create the innovation concerned.

The task now is to find the characteristics of an invention that influence the rules of patent law. By structuring patent law as a computer program, a correspondingly clear structure is achieved.(Pimparkhede, 2017, pp. 299–370, 533–651)

An invention in terms of patent law can be regarded as an object according to computer science. This object has properties. It is the task to determine these

possible properties. Secondly, it is necessary to find out under which conditions which values will be assigned to these properties. For this purpose, a distinction is made between the provisions of patent law in:

- functions that assign properties to inventions and
- functions that assign values to these properties of inventions.

In addition, there will be functions that control processes leading to the discontinuation of a patent or a patent application on the basis of the properties. Further, there will be functions that control the grant process or the process for eliminating the patent or patent application without regarding the properties of the invention. Such functions can be provisions that concern administrative processes. In particular the last type of functions has nothing to do with the properties of an invention and can be disregarded.

6.3.4 Functions for assigning properties to an invention

German and European patent law have the following functions, which define the properties of an invention.

PatG

On the basis of figure 13, the properties of an invention can be identified, namely technical nature, novelty, inventive activity, industrial susceptibility, feasibility, right language and being a state secret. In addition, it must also be taken into account that an invention must have an inventor under §6 PatG. Inventorship is therefore another characteristic of an invention.

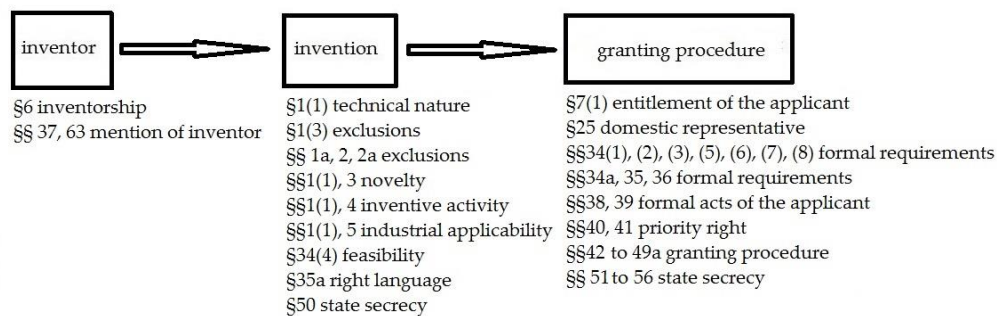


Figure 13: Properties of an invention due to PatG

§1(1) PatG can be interpreted as a function that defines properties. The following properties will be assigned to an invention (Bacher, 2015; Moufang, 2017a):

- technical nature,
- novelty,
- inventive step and
- being susceptible of industrial application.

The technical nature is a prerequisite for the existence of an invention at all and is therefore not taken into account in the following.

§6 PatG defines the property inventorship of an invention.(Melullis, 2015b)

§34(4) PatG describes the property of feasibility of an invention.(Schäfers, 2015d)

§35a PatG defines the property of being in the German language.(Moufang, 2017e)

§37 PatG defines the right to be mentioned as the inventor.(Moufang, 2017f)

§50 PatG defines the characteristic of being a state secrecy.(Schäfers, 2015i)

EPC

With the help of figure 14 the properties of an invention can be identified as right language, technical nature, novelty, inventive activity, industrial applicability and feasibility. Further, an inventor is assigned to an invention.

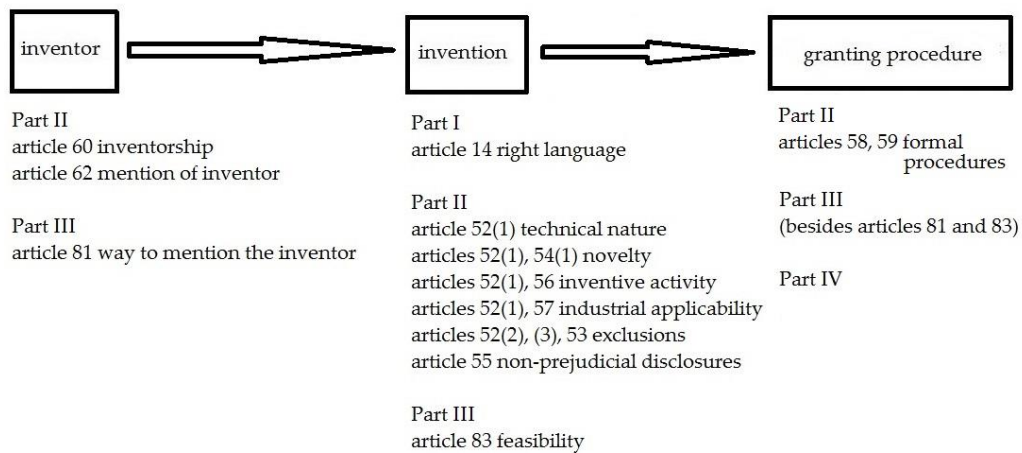


Figure 14: Properties of an invention due to EPC

The European patent act EPC contains provisions corresponding to the German patent act PatG.(Kraßer and Ann, 2016, §1 Rdn. 7-14)

Article 14 EPC determines the right language.(Stauder, 2016a)

Article 52(1) EPC specifies four important requirements for patentability of an invention(Visser, 2017, pp. 56–57):

- technical nature,
- novelty,
- inventive step and
- being susceptible of industrial application.

The technical nature is a prerequisite for the existence of an invention at all and is therefore not taken into account in the following.

The article 60(1) sentence 1 EPC determines, that the invention belongs to the inventor or his successor in title. Therefore this provision assigns the property of inventorship to the object invention, wherein the person, who made the invention, is the owner.(Bremi and Stauder, 2016a Rdn. 6) The inventor must be a natural person.(Bremi and Stauder, 2016a Rdn. 4) A European patent may be

granted to several inventors who form a community of inventors.(Bremi and Stauder, 2016a Rdn. 7-10)

Article 62 EPC defines the right to be mentioned as the inventor. Therefore, it is necessary to identify the inventor, because there is an obligation to mention the inventor.(Bremi and Stauder, 2016c)

Article 83 EPC defines the property of being sufficiently disclosed.(Teschemacher, 2016c)

6.3.5 Functions for assigning a value to a property

The provisions that determine the values of the properties of the invention are searched.

PatG

There are the following rules, which assign values to the properties due to the circumstances of the situation of the creation of the invention. These circumstances are determined by the innovation method chosen.

§3 PatG assigns values to the property of novelty of an object invention. §3(1) PatG defines that an invention has the value true for the property of novelty if it was not disclosed to the public. If the invention was made accessible to the public, the property novelty gets the value false.(Melullis, 2015a; Moufang, 2017b)

§4 PatG defines the assignment of values to the property inventive activity. If the invention is obvious to a person skilled in the art the property inventiveness gets the value false, otherwise true.(Moufang, 2017g)

§5 PatG defines the assignment of values to the property susceptible of industrial application. The property susceptible of industrial application of an invention will be assigned the value true if there is a commercial application of the invention concerned, otherwise, the property is assigned false as value.(Asendorf and Schmidt, 2015b)

§6 PatG assigns the value of the inventor to the invention. The inventor is the person, who "made" the invention.(Melullis, 2015b; Moufang, 2017l)

§34(4) PatG defines the feasibility of an invention. According to the German patent law an invention is feasible if a person skilled in the art is able to execute, build or reproduce the invention.(Schäfers, 2015d)

§35a PatG defines the property of being in the German language.(Moufang, 2017e)

§50 PatG defines the characteristic of being a state secrecy.(Schäfers, 2015i)

§63 PatG describes the proceeding to realize the right due to §37 PatG.(Schäfers and Schwarz, 2015b)

EPC

Article 14 EPC determines the right language. A patent application is in the right language if it is written in German, English or French.(Stauder, 2016a)

The article 54(1) EPC defines the property novelty of the object invention. This property is true if the invention is not already known to the public. This means the invention does not form part of the prior art.(Lindner, 2016a, Rdn. 1)

The prior art is defined in article 54(2) EPC. Due to article 54(2) EPC everything belongs to the state of the art, which was accessible to the public prior to the date of filing.(Lindner, 2016a, Rdn. 13-20) Article 55(1)a EPC provides exclusions of disclosures of the invention from forming prior art due to article 54(2) EPC in case of an obvious abuse. A further exception is an exhibition in accordance with article 55(1)b EPC.(Stauder, 2016b)

The article 56 EPC defines the property of inventive activity, wherein an invention is based on an inventive activity if the subject matter of the invention is not obvious to a person skilled in the art.(Kroher, 2016)

The property industrial applicability can be assigned the values true or false depending on the possibility to be used in industry due to article 57 EPC. Industrial applicability has to be understood in a broad sense. Every kind of economical use, which aims to gain a profit, is comprised by industrial applicability.(EPO, 1986)

The article 60(1) sentence 1 EPC assigns the value of the inventor to the invention.(Bremi and Stauder, 2016a Rdn. 6)

The article 81 EPC describes the implementation of the designation of the inventor.(Teschemacher, 2016b)

Article 83 EPC defines the property of being sufficiently disclosed. This property is fulfilled, if the invention is clearly described to be executable by a person skilled in the art.(Teschemacher, 2016c)

6.3.6 Functions for steering the granting procedure on basis of values

The granting process is directed by the properties of the invention concerned. Therefore, the values of the properties are important for the result of the granting process. The values of the properties may depend on the circumstances of the innovation process, which are determined by the innovation method chosen.

PatG

§§42 to 49a: These provisions are concerned with the granting procedure.

§§51 to 56: These rules are concerned with the property of being a state secrecy.

The provisions §§42 to 49a PatG define proceedings before the GPTO. These proceedings represent the granting procedure, which can be understood as a work flow, which is directed by the values of the properties of the invention. If every invention would have the same values of properties, the work flow “granting a patent” would lead always to the same result.

§42 PatG defines an initial examination of the application by the GPTO, by which for obvious errors are searched for.(Schäfers, 2015g)

Pursuant to §48 PatG, a patent application will be refused if deficits complained of by the patent office are not remedied.(Schäfers, 2015h)

The functions §§42 to 49a and 51 to 56 PatG only use variables that have already been determined for an invention. There are therefore no additional characteristics of an invention.

EPC

Articles 90 to 98 EPC lay down the procedure for grant of a patent.

Article 94 EPC states the substantive examination of European patent applications especially on basis of the requirements of novelty and inventive activity.(Heusler and Stauder, 2016a)

Article 97 EPC describes the granting or refusal on basis of the values of the properties of the object invention.(Heusler and Stauder, 2016b)

No additional properties of an invention are used.

6.3.7 Functions for steering the granting procedure without values

In computer science, there are functions without parameters. The rules of patent law comprise provisions, which are not affected by the values of the properties of an invention. These functions can be regarded as such functions without parameters. These functions can be neglected for this thesis because these functions do not lead to different results for OI inventions compared to CI inventions.

The following rules can therefore be disregarded:

PatG

§7(1) defines the entitlement of the applicant.

§15(1) PatG describes the inheritance of an invention and the possibility of transferring an invention.

§15(2) and (3) PatG define licenses for inventions.

§17 determines annuity fees.

§25 determines the requirement of a domestic representative.

§§26 to 33 deal with Patent Office's internal proceedings.

§§34(1), (2), (3), (5), (6), (7), (8) deal with formal requirements.

§§34a, 35, 36 deal also with formal requirements.

§§38, 39 describe formal acts of the applicant.

§40, 41 determine priority rights.

§§65 to 72 are concerned with the Federal Patent Court.

§§86 to 99 deal with general provisions for the Federal Patent Court.

§§100 to 109 describe general provisions for appeal proceedings before the Federal Supreme Court.

§122 describe appeal proceedings against decisions of the Federal Patent Court.

§122a defines an infringement of right of hearing.

§§123 to 128b comprise provisions for the Patent Office and the Federal Patent Court.

§§129 to 138 determine legal aid proceedings.

§146 deals with mentioning of patents and patent applications for advertising purposes.

§147 is a transitory provision.

EPC

Part I comprises general and institutional regulations (exception: article 14 EPC).

Part II: The articles 58, 59 and 63 to 74 describe formal procedures.

Part III: All articles of part III can be neglected besides articles 81 and 83.

Part VII comprises common provisions on the distribution of information and similar formal proceedings.

Part VIII describes the link to national law.

Part IX contains special agreements.

Part X describes the relationship between EPC and Patent Cooperation Treaty (PCT).

Part XII comprises formal provisions.

6.4 ANSWER TO THE FIFTH RESEARCH QUESTION

With the help of structuring patent law as a life cycle and as elements of a computer program, the properties of an invention could be determined.

The object invention has the following properties:

- **inventorship, comprising**
 - **mentioning the inventor,**
 - **property in the invention,**
- **novelty,**
- **inventive activity,**
- **susceptible of industrial applicability,**
- **feasibility,**
- **being in the right language and**
- **being a state secrecy.**

7 RELEVANT PROPERTIES OF AN INVENTION

The properties of an invention will be examined with regard to importance for the relationship between patent law and OI. This makes it possible to determine how patent law and the innovation method chosen interact due to the touchpoint OI and patentability.

7.1 SIXTH RESEARCH QUESTION

The properties of an invention are examined to determine whether they are relevant due to the type of innovation method chosen.

Sixth research question

Which properties of an invention due to patent law behave differently depending on the selected innovation method?

7.2 LANGUAGE

An invention is written in a language, for example English. The language represents a feature of the invention. An invention filed with the EPO may be written in any language due to article 14(2) EPC. If the invention is not available in one of the official languages of the EPO, English, French and German, a translation of the invention has to be submitted in one of these languages.(Stauder, 2016a)

Due to §35a PatG a German patent application must be written in German. But, if a patent application was filed in another language, a translation into German can be filed within three months due to §35a(1) sentence 1 PatG.(Schäfers, 2015e)

A patent application can therefore be submitted in any language. If the patent application is written in the “wrong” language, a version of the patent application can always be filed in the required language.

The property in which language the invention is written has no effect on the further fate of the invention.(Moufang, 2017a Rdn. 24) Therefore, if there is an influence on the language by the type of invention method chosen it can be neglected. For this reason, this property will not be regarded. The language in which a patent application is written is not an important characteristic of an invention for this thesis.

7.3 FEASIBILITY

Due to article 83 EPC, an invention is feasible if a person skilled in the art is able to carry out the invention based on the technical teaching of the patent application by using common technical knowledge without undue effort, wherein the complete patent application has to be regarded.(EPO, 1984)

According to §34(4) PatG there is an enabling disclosure of an invention, if a person skilled in the art can execute the invention. A person skilled in the art does not need to be an outstanding expert. It is sufficient, if he is an ordinary practitioner.(Schäfers, 2015d; Moufang, 2017c)

The characteristic of the "sufficient disclosure" is related to the quality of the description of the invention and not directly to the invention itself. It can be understood that a complicated invention can be sufficiently disclosed by a well-written patent application, and a simple invention which should also be simple to be sufficiently disclosed, can be not sufficiently disclosed because the patent application has been made negligently.(Teschmacher, 2016c, Rdn. 12-15)

For this reason, "sufficient disclosure" is not considered a property of an invention, which depends from the type of innovation method. Therefore, this property is not examined in this thesis.

7.4 INDUSTRIAL APPLICABILITY

The property "industrial applicability" of an invention has to be interpreted in a broad sense. This is implied by the formulation "any kind of industry" of the §5 PatG and article 57 EPC.(Moufang, 2017j Rdn. 8; Visser, 2017, pp. 126–127)

Indeed, if there is the possibility to generate a turnover with a product or a method based on the invention, this criterion is fulfilled. Only if there is only a private use of the product in question possible and this use cannot be offered by an industrial or commercial application then there is no industrial applicability.(EPO, 1995a)

Therefore, if the corresponding product or method can be industrially manufactured at all, then the invention is susceptible of industrial application. For this reason, it is almost impossible that this condition of patentability is not met by a technical product or process. Since this requirement is met in almost every situation thinkable, this requirement of the patent law is not examined.

7.5 STATE SECRECY

A patent application contains a state secret if the publication of the patent application endangers the security or the existence of the state.(Schäfers, 2015i Rdn. 4-8e) The criteria that determine whether a patent application contains a state secret can therefore be regarded as independent of patent law and the innovation method chosen. The §§50 to 56 PatG are therefore not taken into account.

If a state secret should be submitted as a European patent, the patent application must be filed first with the national patent office concerned, for example the GPTO.(Keukenschrijver, 2016r Rdn. 13) Therefore, the respective national regulations regarding a state secret always apply. Additional regulations of the EPC are therefore not necessary.(Keukenschrijver, 2016r Rdn. 22)

7.6 NOVELTY

Article 54(1) EPC and §3(1) sentence 1 PatG define each the novelty requirement. A patent can only be granted if the technical teaching, which is described by the patent, is novel before the background of prior art. The prior art is defined by article 54(2) EPC and §3(1) sentence 2 PatG, respectively.(Lindner, 2016a; Moufang, 2017b)

The prior art comprises those documents, which are accessible to the public prior to the filing date of the patent application. Oral descriptions and prior use is also encompassed by the term of prior art. Further, due to §3(2) PatG, third party patent applications published after the filing date but filed with the patent office before the filing date of the own patent application have also to be regarded as potentially novelty-destroying. Therefore, an invention is new if there is no single written or oral disclosure or disclosure by use, which describes all features of it. In this case, the invention does not form part of the state of the art.(Lindner, 2016a, Rdn. 13-50) The analog provision of the European patent law is included in article 54(3) EPC.(Visser, 2017, pp. 94–98)

The novelty is always endangered if the invention becomes known. Therefore, if the invention remains within a company, the novelty keeps intact in all cases. If the invention leaves the company, the special circumstances of the case must be clarified in order to decide whether the novelty of the invention will be retained.

The problem of keeping an innovation secret due to novelty criterion has got worse. Nowadays, there are not only local effects because of personal contacts. Further, there are global effects by mass media. For example online social networks are important with respect to widespreading of information.(Myers, Zhu and Leskovec, 2012; Guille *et al.*, 2013) Another cause for the difficult control of knowledge of a firm is the increasing mobility of employees.(Chesbrough, 2003, p. xxii)

7.6.1 Prior art

The term prior art is defined by article 54(2) EPC and §3(1) sentence 2 PatG. Only technological knowledge is regarded as state of the art in terms of article 54(2) EPC and §3(1) sentence 2 PatG.(Lindner, 2016a; Moufang, 2017b Rdn. 14-134)

The patent law realizes an absolute concept of novelty, i. e. everything that was made available to the public has to be considered as prior art. The state of the art comprises the whole technological knowledge of the world in written or oral description or by public prior use. There is no restriction on the way knowledge was made public. Everything, what is made public is regarded as prior art as far as it is made public before the filing date of the patent application concerned. If the patent application claims priority only those documents has to be considered, which were made public before the priority date.(Moufang, 2017b Rdn. 8)

Information is made public if there is the possibility to get notice of the information. For “making public” it is not a requirement that a person indeed hat taken notice of the information. It is sufficient, that there was the possibility to get access to the information without breaching confidentiality.(EPO, 1990a, 1992) Therefore, an invention becomes public if it is theoretically possible to get aware of it.(EPO, 1990b)

The public must be able to find the document revealing the invention. Depending on the situation there must be information about the document to get to the document. Therefore, the document must be prepared for being public. A document must be accessible, for example by a catalogue of a library. Otherwise, the document is deemed to be not part of the prior art despite it is at the library.(EPO, 2002b)

An invention is only available to the public if there is a direct and unambiguous access.(EPO, 1993a, 1995c) It is not sufficient that there is theoretically a

possibility of an access of the public. One example is a website with an unknown URL-address. This website is considered as not accessible. On the other hand, if the URL-address is in such a way straightforward, that it is easy to find out, the content of the website is deemed to be made public. If the website can be found by a web search engine by using one or more keywords which are related to the subject matter of the content then the content of the website forms also part of the prior art.(EPO, 2012a)

Public accessibility is assumed even if the person, who represents the public, is a straw man and even if it is very difficult to get the knowledge about the invention.(EPO, 2009c)

The public in terms of article 54(2) EPC requires not a minimum number of persons. Further, the persons, representing the public, do not need to have a minimum level of education.(EPO, 2000a)

Article 55(1) EPC establishes two cases by which a disclosure does not form part of the state of the art. One possibility is that the invention was presented at an acknowledged exhibition. The exhibition must be one falling within the terms of the Convention on International Exhibitions signed at Paris on November 22, 1928 and last revised on November 30, 1972. The other possibility is that the invention was disclosed by an abuse.(Stauder, 2016b)

A publication by mistake does not form an abuse. Therefore, if an invention is disclosed without the agreement of the inventor the disclosure counts as prior art despite the Article 55(1) EPC. Abuse takes place either by an intent to harm the inventor or if the abuser knows about the harming effect of the publication.(EPO, 1996a) On the other hand, a board of appeal saw a publication by mistake as abuse in terms of article 55(1) EPC. The intention to harm was not regarded as a requirement for abuse.(EPO, 1987)

There is a time-limit of six months. Only within this time period before the filing date of the patent application, the grace period according to article 55(1) EPC can be claimed.(Stauder, 2016b) The German paragraph analogous to article 55 EPC is §3(5) PatG.(Moufang, 2017b Rdn. 182-192)

Public prior use

For a public prior use, the invention must be disclosed to a person skilled in the art by usage of the invention. In this sense a person skilled in the art can be understood as a person, who comprehends the invention. But, this does not mean that the disclosure of the invention to visitors of a firm does not harm

novelty requirement. It is not necessary that specific individuals get access to the invention. It is sufficient if the invention was disclosed to unknown people.(EPO, 2003)

Therefore, there is public prior use if a single person gets access to the invention and understands it. A further requirement is that this person is not bound to an obligation to maintain secrecy. The obligation can be tacit or express. For proving a public prior use a “balance of probabilities” is not sufficient. There is a necessity of an “absolute conviction”.(EPO, 1998c, 1998g)

Delivery of products, realizing the invention, can be regarded as public prior use depending on the circumstances. If a huge amount of products will be delivered and in the case of a printed catalogue of the products a public prior use will be assumed.(EPO, 2002b, 2009a)

R&D cooperation

It can be expected that business partners maintain secrecy about their invention. It is not necessary that these business partners are well-known. But it is an indication, if they are.(BGH, 1978b) Therefore, it depends on the person, who receives the invention. If the person is anonymous and cannot be interrogated in order to clarify the situation it can be assumed that the invention was made public. Therefore, crowdsourcing, wherein persons are involved, who are not well-known and whose identity cannot be determined, cannot generate new inventions.

A European appeal board stated that during development procedure with cooperating partners a tacit nondisclosure agreement can be assumed. The partners prevent the free access to the invention because of common interest to maintain the invention secret.(EPO, 1995b) An OI process is a development process. Therefore, at first stage maintaining of secrecy can be assumed.

From the time of production of the products based on the invention, the situation is completely different. There is no more an interest for keeping the invention secret, because the products embodying the invention are deemed for selling. The tacit obligation to maintain secrecy has fallen away.(EPO, 2010)

For an obligation to maintain secrecy an express agreement, for example a written contract, is not necessary. It is sufficient that the business partners have agreed verbally to maintain secrecy. This agreement can even be tacit if common interests can be assumed.(EPO, 1994c)

Sale

The sale of one product to a buyer, wherein there is no obligation to maintain secrecy, makes the invention, if it can be derived from the sold product, public. One single sale is typically novelty-destroying. Therefore, selling the product destroys the novelty of the inherent invention.(EPO, 2002a) On the other hand the sale does not harm novelty if the buyer is bound to an obligation to maintain secrecy.(EPO, 1992) Therefore, the sale of a single product can establish novelty-destroying prior art especially if the buyer is an end-user whose interest is to use the product and therefore does not have an interest in secrecy.(EPO, 1994a)

Presentation

An invention is only made public by a presentation if the invention can be understood directly and unambiguously by the public from the presented device, incorporating the invention. The presentation of a machine, whose working principle was not apparent from merely looking at the machine, cannot be added to the prior art.(EPO, 1998f)

A demonstration of products to members of the own company is, as a rule, no public demonstration because it is assumed that the employees are bound at least to a tacit agreement of confidentiality.(EPO, 2000c)

Oral description

Reliability of oral description is difficult. For example, as a proof for the content of a lecture, it is not sufficient what the lecturer says what he lectured because this is just what the lecturer wanted to convey. This is not the thing what really arrived at the audience. If there are at least two members of the audience, who understood the invention, then the lecture is novelty-destroying for the invention. The notes of only one member are insufficient because it might reflect only the thoughts of this member.(EPO, 2001a; Geschka and Meitinger, 2018, p. 5)

In the case of an oral description of the invention, the person representing the public must be a person, who is able to understand the lecture. Otherwise, the invention was not made public.(EPO, 1993c; Geschka and Meitinger, 2018)

Internet

Internet publications, namely websites, were assessed by the boards of EPO in different ways. In the past, it was claimed that internet publications have to fulfill very high standards to be accepted as prior art publications. An internet document was only used as proof in case the document derived from the

website is “beyond any reasonable doubt”. If the website was “reputable” a printed date was accepted without further investigations. Otherwise, further investigations were necessary.(EPO, 2007, 2008a)

Actual decisions doubt the necessity of these high standards. It is argued that only because of the possibility to change the internet publications easily it is not justified to use higher standards of proof. It is not necessary that internet publications fulfill a proof beyond every doubt to be accepted. It is sufficient if the internet publication fulfills the requirements of other public prior use proofs. An evaluation by the “balancies of probabilities” must be sufficient.(EPO, 1998d, 2011, 2012c, 2014)

It can be supposed that a high price of a document leads to the non-availability of this document. On the other hand, prices are adapted to the actual market situation. Therefore, a high price reflects only the possibility of the market members to pay high prices. Before the background of this assumption, it can be assumed that the content of expensive websites forms part of the prior art.(EPO, 2004b)

Non-disclosure agreement

A non-disclosure agreement exists if it has been agreed in writing or verbally with a person, for example the inventor, that he will not disclose the invention to the public. In the absence of an express non-disclosure agreement, the circumstances may nevertheless result in the person concerned feeling bound by a tacit non-disclosure agreement. In this case too, the criterion of novelty is maintained.(Melullis, 2015a Rdn. 253)

Employees

The decision “Herzklappenprothese” by the Federal Supreme Court stated that the knowledge of an invention of persons within a firm, who are involved in the development of the invention, does not harm novelty. The same applies for the persons outside the organization who are also involved in the development or the testing of the invention.(BGH, 1999)

If the inventor is an employee of a company, an explicit non-disclosure agreement can be assumed if a corresponding clause is included in the employment contract. Otherwise, a tacit non-disclosure agreement may be supposed. Discussions, tests and presentations of an invention with an employee are therefore not questionable with regard to the novelty criterion. Therefore, for example company papers, which are only distributed within the

company, cannot be regarded as prior art documents for an invention.(BGH, 1962, 1963, 1966b, EPO, 1994c, 2000b)

R&D cooperation

The creation of an invention by a R&D cooperation is not detrimental to the novelty criterion of the patent law if only employees of the companies involved in the R&D cooperation participate. In this case, jurisprudence assumes that none of the parties have an interest in publishing the invention before filing a patent application. It is therefore assumed that the employees of the companies feel bound by an implicit non-disclosure agreement, unless these non-disclosure agreements have already been fixed in writing in the respective employment contracts.(EPO, 1996c)

It is also possible that an invention is developed together with a customer. In this case, the circumstances of the individual case must be taken into account in order to decide whether the novelty criterion is met. For example, if the customer has a close relationship with a competitor, the invention is not considered to be new.(EPO, 1997a)

However, if it is more likely to be assumed that the customer works closely with the own company and is aware of the fact that a joint development for a common product is to be carried out, at least an implied non-disclosure agreement can be assumed.(EPO, 1994b)

Neither express nor tacit agreement of secrecy

During an innovation project, such as a crowdsourcing project, it may be necessary to present the invention to the members of the innovation project in a presentation or a lecture. If in this case not all participants of the presentation are bound to a non-disclosure agreement, the invention shall be deemed to have been disclosed to the public.(EPO, 1991, 1996b, 1998e, 1998b, 2000d, 2001a)

Miscellaneous

If the relevant publication is a document, which was sent from a scientist to colleagues, there is no novelty destroying act. The Federal Supreme Court stressed that it is typical for scientists to send documents to selected colleagues for scientific discussion. Therefore, there is a relationship of trust not to allow access to the document for a third party even without a written secrecy agreement. On the other hand, if an anonymous person gets notice of the invention, whose habits cannot be predicted, the invention loses its novelty.(BGH, 1993, p. 468)

An invention can be created in the course of a market test. In this case, test persons can become external inventors. The inventive test persons must be bound to a non-disclosure agreement. In addition, care must be taken to ensure that the invention itself does not become known to other persons, for example from the environment of the test persons. It is therefore important that the persons who become aware of the invention, keep the invention secret and know that they should keep it secret. Otherwise, the novelty criterion of patent law is infringed.(EPO, 1997b, 1998a, 2009b; Geschka and Meitinger, 2018, p. 4)

7.6.2 Procedure of assessing novelty

A document published before the filing date of the invention is novelty-destroying if all features of the invention can be found in a single site of this document. A single site is not a combination of several items of the document, which are not logically combined, for example several items of a catalogue.(Moufang, 2017b Rdn. 135-137; Visser, 2017, p. 81)

7.6.3 Innovation methods and novelty

The four innovation methods are evaluated with regard to the criterion of novelty of patent law. In particular, it will be analyzed whether the innovation methods differ with regard to this criterion. In this case, the novelty criterion is an important characteristic of an invention that needs to be examined in more detail.

Closed innovation

Jurisprudence shows that an invention that remains within a company and is only shown to its own employees is regarded as new, since it is assumed that the employees are bound to an explicit or implicit confidentiality agreement. Patent offices and courts suppose that employees of a firm are obliged of secrecy. Therefore, in case an invention is kept within a firm there is no deficit of novelty. On the other hand, if an invention crosses the boundaries of the firm there is a danger for novelty in terms of patent law.(BGH, 1962, 1963, 1966b, EPO, 1994c, 2000b) Therefore, a CI innovation method does not endanger the novelty criterion.

Firm-to-firm OI

In the case of a firm-to-firm OI such as a R&D cooperation the case law assumes that the companies involved have an interest in keeping the invention secret. It can therefore be assumed that the firm-to-firm OI innovation method does not undermine the novelty.(EPO, 1996c)

OI with external inventors

It is no problem if a group of persons knows the invention if these persons accept that the invention has to be kept secret. This group of persons can even be a big number of persons. But, if a person gets notice of the invention or is able to get notice of the invention without the obligation to keep the invention secret, then the invention became public. Therefore, the difference is that the persons must know that the invention has to be remained secret. In case the persons know that there is an invention to be protected by a patent, it can be assumed that the invention is not published to the public. Therefore, if a non-disclosure agreement exists, the invention is new. Otherwise it shall be deemed to have been disclosed to the public.(EPO, 1991, 1996b, 1998b, 1998e, 2000d, 2001a)

The discussion of the case law has shown that a non-disclosure agreement is absolutely crucial for compliance with the novelty criterion in an OI project. If there is a non-disclosure agreement, the OI project meets the novelty criterion. Otherwise it will be violated. In the case of an innovation method with an external inventor, it cannot always be assumed that a confidentiality agreement is in force, because the external inventor is not an employee of a firm involved in the innovation process.

Summary

The discussion of the novelty criterion shows that the behavior of the persons involved in an innovation process can decide whether an invention remains new. For example, if a person makes the invention available to the public by a public prior use, the novelty criterion is no longer fulfilled. A big number of persons can therefore increase the possibility that a disadvantageous behavior of the persons concerned results in a novelty-damaging behavior. The novelty of an invention therefore has to be investigated in detail.

OI is characterized by the fact that the invention is at least not exclusively created within the boundaries of a single organization.(Chesbrough, 2003, p. 43) Therefore, it is decisive whether the external inventors are bound to a secrecy agreement. If the external inventors belong to another organization, the external inventors are bound by a confidentiality agreement with their organization. In case this organization forms with the own organization a R&D cooperation, there are no problems because of the novelty criterion of the patent law. It follows from this that an invention based on CI or on firm-to-firm OI does not pose any problems with regard to the novelty criterion.

The situation is different if there are external inventors who are not employees of a company involved in the development of the invention. In this case, it is necessary to clarify case-by-case whether a non-disclosure agreement exists. This can only be clarified if the circumstances of the individual case are taken into account. In case there is no express or tacit obligation to maintain secrecy the invention became public. In this case, a patent is not possible because of lack of novelty.(Geschka and Meitinger, 2018)

Due to the aspects of tacit or explicit non-disclosure agreement the innovation methods with external inventors can endanger the novelty criterion. Therefore, the innovation methods CI and firm-to-firm OI are in line with the novelty criterion due to patent law, whereas the innovation methods OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor are not in line with this criterion.

7.7 INVENTIVE ACTIVITY

To be patentable an invention must be not only novel but also be based on an inventive activity.(Schick, 1984; Storz and Hüttermann, 2012) A missing of the requirement of inventive activity could lead to worse conditions for highly innovative industries.(Hunt, 1999) Trivial patents, which only protect incremental innovations or maybe no real innovations at all, impose only to innovating firms additional costs.(Moir, 2009) For this reason, the criterion of inventive activity is important.

Article 56 EPC and §4 PatG, respectively, define the evaluating of the inventive activity of an invention. The invention is based on an inventive activity if it is not obvious before the prior art to an average person skilled in the art.(Kulhavy, 2011; Moufang, 2017g) Therefore, a minimum inventive step is required for an inventive activity in terms of patent law.(Dolder, Ann and Buser, 2011)

7.7.1 Prior art

The state of the art, which must be evaluated when assessing the inventive activity, corresponds to that of the criterion of novelty with the exception of the relevant dates for the prior art.(Kroher, 2016, Rdn. 8-19) The filing date or the priority date is the relevant date for determining the relevant state of the art. Additionally due to §4 sentence 2 PatG and article 56 sentence 2 EPC, the date of publishing of the document of the state of the art is also important for the requirement inventive activity due to patent law.(Moufang, 2017g Rdn. 16; Visser, 2017, pp. 107–108)

7.7.2 Procedure of assessing inventive activity

The assessment of the inventive activity differs from that of the novelty in that several documents are taken into account together in the assessment. This is because the mere combination of well-known subject-matters should not lead to an inventive activity. Only in case there is a surprising new result, the combination can result in inventive activity.(Lunney Jr., 2001)

A method for assessing the inventive activity is the problem- and solution-approach. The problem- and solution-approach serves to objectively evaluate the inventive activity. By applying this procedure, the development of the invention is emulated from the standpoint of a person skilled in the art. First, the document of the state of the art that comes closest to the invention is determined. On the basis of this closest technology, it is determined which advantages the invention has. Based on the advantages over the state of the art, the task to be solved in order to achieve the invention is defined. Outgoing from this task that solves the invention, it can be determined whether there is a sufficient inventive activity.(Kraßer and Ann, 2016, §18 Rdn. 89-94; Moufang, 2017g Rdn. 27-29)

The problem- and solution-approach is not intended to emulate the development of the invention how it really happened, but rather the one that demonstrates the value of the invention objectively. For this purpose, it is assumed that the best possible conditions are in place. This assumption includes that the inventor is aware of the state of the art and that he is a person skilled in the art.

7.7.3 Person skilled in the art

It is necessary to determine a person skilled in the art for the evaluation of the inventive step. A person skilled in the art is almost always an engineer. In case the subject matter of the invention is not something, which has to do with an engineer, then the assumed person skilled in the art is a craftsman.(Breuer, 1997, p. 16)

The person skilled in the art is a fictitious person.(Kraßer and Ann, 2016, §18 Rdn. 46-47) Therefore, there can be problems in defining this fictitious person.(Winkler, 1958, p. 155) As a result, problems arise in the identification of the inventive step which is necessary for the invention to be patentable.

7.7.4 Characteristics of an inventive activity

There are hints for the fulfillment of the requirement of an inventive activity according to §1(1) in conjunction with §4 PatG and article 52(1) in conjunction with article 56 EPC.(Kroher, 2016; Moufang, 2017g) The hints are as follows:

- “Satisfaction of a long-felt need or want” (Moufang, 2017g Rdn. 78-80)
- Unsuccessful “efforts of experts” (Moufang, 2017g Rdn. 82)
- Lucky choice; Surprising effect (Moufang, 2017g Rdn. 108)
- “Praise of experts” (Moufang, 2017g Rdn. 123)
- Invention is a “mass produced article” (Moufang, 2017g Rdn. 124)
- “New way to a known object” (Moufang, 2017g Rdn. 132)
- “Commercial success” (Moufang, 2017g Rdn. 162-164)
- If the prior art points in a different direction than the invention, an inventive step of the invention can be assumed. (Moufang, 2017g Rdn. 158)
- If the problem solved by the invention was not known, it can be assumed that the invention is inventive. (EPO, 1993b; Kroher, 2016 Rdn. 51)
- If already known means are used for a new purpose, the technical teaching of the invention can be regarded as not obvious. (EPO, 1983; Kroher, 2016 Rdn. 52)

It is therefore clear that obvious technical teachings are not patentable.(Kraßer and Ann, 2016, §18 Rdn. 6)

Scientific research distinguishes between incremental and radical innovations.(Ili, 2010) Incremental innovations are only a small technological progress, whereas radical innovations represent a big step forward.(McAdam, Armstrong and Kelly, 1998, p. 140; Scigliano, 2003, p. 20; Gassmann, 2006, p. 4; Hagenhoff, 2008, p. 179; Kalogerakis, 2010, p. 10; von Ahsen, Heesen and Kuchenbuch, 2010, p. 8) With regard to the hints for inventive step under patent law, it can be assumed that radical innovations rather than incremental innovations are patentable.

7.7.5 Innovation methods and inventive activity

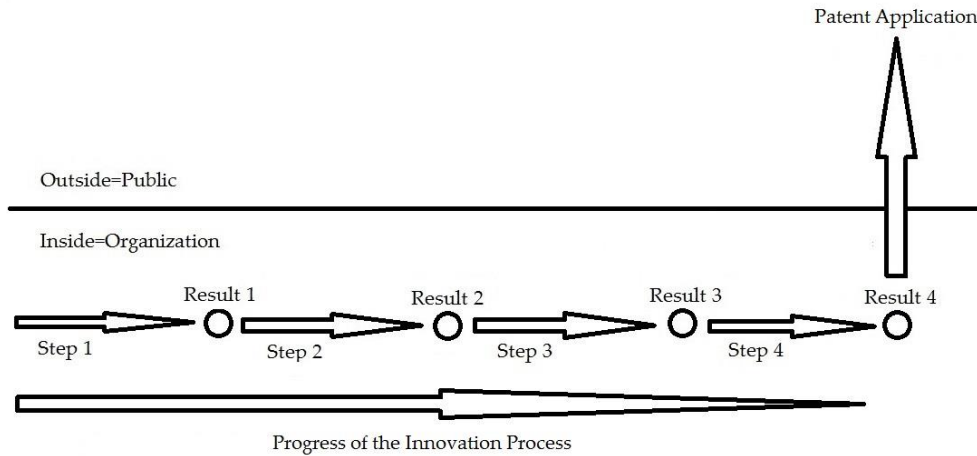


Figure 15: Closed Innovation

An innovation process according to CI is closed to its environment. There is no way that information from the innovation process can get out and thus call into question the inventive activity of one's own innovation. The shielding of the innovation process preserves the inventive activity of one's own innovation. (Kroher, 2016, Rdn. 8-19)

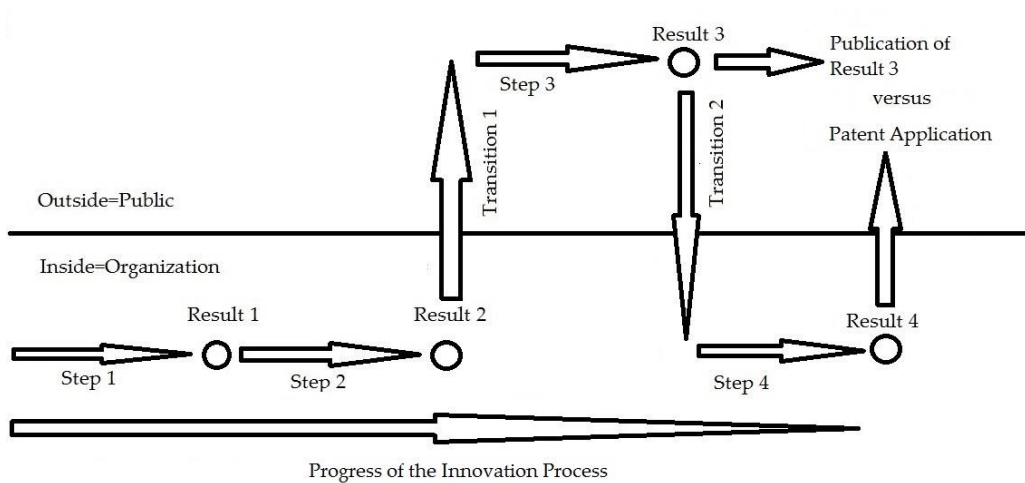


Figure 16: Problem because of inventive activity

The innovation process due to figure 16 may result in the publication of the result 3 of the own innovation process. This result 3 could be published in a

document, which could be regarded as starting point for the evaluation of the inventive activity of the own patent application by the problem- and solution-approach.(Kroher, 2016, Rdn. 55-71)

The problem- and solution-approach makes it clear that the quality of the prior art document that comes closest to the invention is decisive for the evaluation.(Kroher, 2016, Rdn. 55) Therefore, if one's own invention leads to the creation of a document comprising the result 3, the inventive step of the own patent application can be endangered.

It can be stated that the criterion of inventive activity due to patent law does not rule out a patentable invention of an OI project. However, the openness of the OI concept can lead to a publication, which contains the invention or at least parts thereof. This publication can question the inventive activity of the own patent application.

Therefore, especially the innovation methods with external inventors can endanger the inventive activity of a resulting innovation. The innovation methods CI and firm-to-firm OI are in line with the inventive activity criterion due to patent law, whereas the innovation methods OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor are not in line with this criterion.

7.8 INVENTORSHIP

The inventorship is described in §6 sentences 1 and 2 PatG and in article 60(1) sentence 1 EPC. Due to these provisions the inventor is the person, who made the invention. A plurality of persons can also make an invention together. The inventors own the invention.(Moufang, 2017; Visser, 2017, pp. 129–130)

The finding that there is property because of intellectual activity, such as an invention, is in the meanwhile common knowledge.(Ann, 2004) A direct consequence out of this finding is the inventor's principle. There must be an inventor of the invention, which must be a human being. An organization cannot be an inventor.(Deutsches Patentamt, 1951; BGH, 1966a, p. 560)

The inventorship according to the patent law leads to three relevant aspects. First of all, the inventor must be identified. Second, there is the requirement of patent law that the inventor must be mentioned as the originator of the invention. Third, due to §6 sentence 1 PatG the inventor has the right to the

patent. This results in the property in the invention.(Keukenschrijver, 2016l Rdn. 8-9) Therefore, there are the following demands of patent law:

Mentioning the inventor

According to §§37 and 63 PatG and articles 62 and 81 EPC the inventor must be mentioned. Therefore, it is important to know the name of the inventor.(Moufang, 2017f, 2017m)

Assigning the property in the invention

According to §6 sentence 1 PatG and due to article 60(1) sentence 1 EPC the invention belongs to the inventor.(Moufang, 2017l)

7.8.1 Identification of the inventor

The inventor's identification is the prerequisite to meet the requirements of patent law after mentioning the inventor and assigning the ownership to the inventor.

The §6 sentence 2 PatG and the article 60(2) EPC define that the inventor is the person, who "makes" the invention. Neither the lawmaker of PatG nor the one of EPC define what "makes" mean.(BGH, 1958, 1978a)

"Making" can mean a lot of things. For example, making can mean that a technical product is built and by doing so an invention is found. It is also possible to understand pure recognition as a "make". Basically, the creation of the preconditions for the development of an invention could also be understood as "making". It would therefore be possible to understand the provision of money as "making". Therefore, "making" can comprise a great variety of meanings. In fact, the creation of an invention can only take place through intellectual activity. The provision of machines or financial possibilities cannot lead to inventiveness. Even a co-inventorship is excluded.(Kraßer and Ann, 2016, §19 Rdn. 20)

Literature and jurisprudence have dealt in particular with two situations in which it is difficult to identify the inventor. Firstly, there can be cases in which no inventor can be determined. Another topic that was worked on intensively is the joint inventorship, wherein an invention results from the joint effort of at least two inventors. The consideration of these problematic situations can help to clarify the problems of identification of an inventor if an innovation method due to OI is applied.

Invention without an inventor

A possible situation may be that there is a research with scheduled series of experiments, where stubborn all possibilities are exercised through by a machine. In addition, the results of the experiments could be evaluated automatically. The research finding could be an invention without an inventor.(Meitinger, 2017d, p. 149)

Another possibility is that “nameless” know-how has accumulated in a company that is patentable. In this case there are human inventors. But, it may be simply impossible to ascertain which employee contributed which share of the company's know-how. This can result in another case, which leads to a de facto invention without an inventor.(Meitinger, 2017d)

These two situations create difficult legal situations, as patent law does not accept inventions without inventors.(Deutsches Patentamt, 1951; BGH, 1966a, p. 560) After the introduction of the amendment of patent law in 1936, inventions without inventors were no longer permissible.(Beier, 1979, p. 670)

A decision of the Higher Regional Court in Düsseldorf determined that, if no one has made an inventive contribution to the invention, that in this case anyone who has made a contribution to the invention at all is considered to be an inventor.(OLG Düsseldorf, 1971)

But even in this case, however, it is still true that a merely supportive activity is not sufficient to be regarded as an inventor.(BGH, 1966a) Therefore, it is not enough to be only the initiator of a project to become an inventor, even if there is no inventive part of any participant of the innovation project concerned.

A decision of the Federal Supreme Court states that there is no inventor if the person in question only provided contributions that did not influence the success or if actions were only carried out on the instructions of another person.(BGH, 2004, p. 51) On the other hand, it can be enough to advise against something to act as an inventor.(BGH, 1966a) But, it is obvious that to advise against something will not be creative under all conditions.

Therefore, the identification of the inventor can be difficult. An OI innovation process that comprises large parts outside of the own organization can even increase these difficulties.

Joint inventorship

A joint inventorship means that a community of inventors has jointly developed an invention. Due to §6 sentence 2 PatG several inventors can make an

invention together. An invention can be made for example by a corporation, which has a cooperation with other corporations or universities, wherein members of the corporations or the universities form together a team of experts to develop the invention.(Reich, 1985, p. 1; Hughes, 1989, pp. 13–52; Mowery and Rosenberg, 1999, pp. 1–2) Therefore, patents can be developed by corporate teams.(Fisk, 1998)

A prerequisite for inventorship of a community of inventors is that all inventors contribute a creative input to the joint invention. In this case the single contributions of the inventors form together an inventive activity.(Kraßer and Ann, 2016, §19 Rdn. 30)

A detailed evaluation of the individual contributions of the inventors is necessary. Only after the evaluation of the individual contributions the participants in the innovation process may be honored as inventors.(OLG Düsseldorf, 1971)

But, there are cases where it is very difficult to determine who the inventor is, if there are several people who have made contributions. Especially, if it is not possible to decide which person was the creator of what feature of the invention.(Schade, 1972, pp. 510–513)

In this case, the creation of the invention was in such way, that it is not possible to allocate the different contributions to the corresponding persons, especially if the single contributions are not separable. In this case one can argue that the single part cannot be understood without the complete invention and therefore it is not possible to evaluate one single part alone.(Lüdecke, 1962, p. 25; Wunderlich, 1962, pp. 61–64; Schade, 1972, p. 513) For example during a crowdsourcing project everybody, who is intellectually involved in the development of the invention, could be regarded as an inventor.

If the innovation process is distributed on a huge amount of contributors, wherein a single person contributes only simple and not inventive contributions, the question is: is there an inventor at all? OI innovation projects can comprise a multiplicity of participants. Therefore, OI can result in a problematic situation of a joint inventorship. Therefore in particular OI with external inventors, for example OI as crowdsourcing, can challenge the inventor's principle of patent law.(Schmidt, 2012, p. 31)

7.8.2 Mention the inventor

According to §§37 and 63 PatG and articles 62 and 81 EPC the inventor must be mentioned. This right is compulsory. Even if the inventor does not want it, he must be mentioned as inventor.(Schäfers, 2015f; Keukenschrijver, 2016m; Teschemacher, 2016b, Rdn. 2; Visser, 2017, p. 135 and 174)

7.8.3 Property in the invention

Patent law is concerned about inventions, wherein inventions are regarded as property. Every property implies an owner. Therefore, it is important for patent law to identify an owner of an invention. The claim of the property of an invention is formulated by §6 sentence 1 PatG.(Moufang, 2017l)

Article 60(1) sentence 1 EPC represents the provision corresponding to §6 sentence 1 PatG. Article 60(1) sentence 1 EPC stipulates that only the inventor is entitled to all rights to the European patent.(Breimi and Stauder, 2016a, Rdn. 6)

In an OI innovation project there is an organization managing the OI project and at least one participant in the innovation process. If the participant is inventive, the invention does not belong to the organization, but remains exclusively with the inventor.(Keukenschrijver, 2016l; Moufang, 2017l)

In case the inventor is an employee of the organization then the organization can as an employer acquire the invention from its employee due to GEIA. But, with OI with external inventors the organization is not the employer of the inventor. Therefore, there can be the problem to acquire the invention for the initiator of the OI project.(Meitinger, 2016, p. 532)

After the invention has been created, an external inventor cannot be forced to transfer the invention to the organizer of the OI project. An exception could result from the principle of "good faith" according to §242 BGB. However, the hurdle to apply the principle of "good faith" is high. It must be unreasonable not to allow the organization to use the invention.(Bartenbach and Volz, 2012, §1 Rdn. 26)

Another possibility to acquire an invention could be a transfer in advance. Such a transfer in advance will probably also fail, since an exact definition of the object to be transferred is a prerequisite. Naturally, however, an innovation cannot be precisely determined in advance due to its novelty character.(BGH, 1955, p. 289; Kraßer and Ann, 2016, §19 Rdn. 14)

An attempt can be made in advance to achieve a favourable regulation of the ownership for the organization by means of general terms and conditions (GTCs). However, a regulation by GTCs can also fail, especially if it is claimed an acquisition of the invention concerned without adequate financial compensation of the inventor.(Meitinger, 2016, pp. 534–535)

Ultimately, an inventor can transfer ownership to the organization after the invention has been created. This results in the risk that the inventor will not hand over the invention, or only with almost unacceptable conditions.(Geschka and Meitinger, 2016, p. 33) Therefore OI with external inventors can lead to problems with inventorship due to patent law.

7.8.4 Innovation methods and inventorship

The characteristic of inventorship is significant with regard to OI, since the innovation process can influence the ownership of the invention and the possibility to mention the inventor.

Especially the existence of external inventors leads to difficulties with patent law with respect to inventorship. The innovation methods CI and firm-to-firm OI can be regarded as being in line with patent law. It is completely different with the innovation methods OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor. These two types of innovation methods can lead to difficulties with inventorship due to patent law. The provisions of inventorship due to PatG and EPC therefore pose a serious problem for OI with external inventors.

7.9 ANSWER TO THE SIXTH RESEARCH QUESTION

Patent law was drafted with respect to CI and the perspective of the sole inventor, who wants to protect his technical idea. OI changed the situation. Nowadays, there can be not even a team of inventors which is constant during the development of the invention, but a group of inventors, which can change steadily. Therefore, OI can lead to legal uncertainties and malfunction of patent law.(Lee, 2009, p. 79)

The existence of one or several contributors to the innovation from outside is characterizing for OI. Patent law does not distinguish between inventors from outside or inside an organization. Further, patent law does not have special rules for an organization, which starts an innovation process, wherein there is

an inventor outside the organization.(Bremi and Stauder, 2016a) Further, the situation of several inventors is just described in one single sentence of the PatG.(Moufang, 2017) In EPC there is even not one single sentence concerning this situation.(Bremi and Stauder, 2016a, Rdn 7) Therefore, it is justified to argue, patent law, PatG as well as EPC, is not prepared to the situation according to OI.

But not all properties of an invention are relevant before the background of OI. An examination of the properties of an invention has shown that the properties industrial applicability, feasibility, language and being a state secrecy are not important. Therefore, these characteristics of an invention will not be regarded in this thesis.

Another result is that novelty, inventive activity and inventorship are relevant if the different effects of the patent law on OI and on CI are evaluated.

The property of inventorship has three essential aspects. On the one hand, the identification of inventors is an essential requirement resulting from the inventor's principle as laid down by law. Further, mentioning the inventor is a requirement of patent law. Furthermore, ownership of the invention results directly from the invention.(Kraßer and Ann, 2016 §19 Rdn. 1-2; Moufang, 2017) The question of inventorship of the invention is therefore also an aspect to be taken into account when comparing the effects of OI and CI.

Overall, it can therefore be summarized that the following properties of an invention are significant for the evaluation of an innovation method for example by OI in the light of patent law.

The significant properties of an invention are:

- **novelty,**
- **inventive activity,**
- **mentioning the inventor due to inventorship and**
- **property in the invention due to inventorship.**

8 GROUPS OF INNOVATION METHODS

This chapter examines the innovation methods in order to form groups of innovation methods. The members of one group shall be homogeneous and members of different groups shall be heterogeneous from a patent law perspective. The criteria for assignment of the innovation methods to groups are the relevant properties of an invention due to chapter 7. The result is a new classification of innovation methods in the light of patent law.

8.1 SEVENTH RESEARCH QUESTION

The properties of an invention under patent law are used to group the innovation methods.

Seventh research question

Which are the groups of innovation methods from the standpoint of the properties of an invention due to the patent law?

The finding of the thesis is up to now that there are four innovation methods, namely CI and the three OI variants. The task is to identify the differences between these variants on the basis of criteria resulting from patent law.

The distinction of the innovation methods will be possible by using the relevant properties of an invention due to patent law. Due to the above-mentioned these relevant properties are novelty, inventive activity, mentioning the inventor and property in the invention. These characteristics of an invention constitute important properties of an invention. (Bremi and Stauder, 2016a, 2016c; Kroher, 2016; Lindner, 2016a; Teschemacher, 2016b)

The various innovation methods are evaluated with regard to these characteristics of an invention. For this purpose, value tables are created. A value table is thus a representation of how an innovation method should be evaluated with regard to patent law. With the help of the evaluation tables, the characteristics of the innovation methods are compared. Innovation methods that have the same value tables are grouped into a common group of innovation methods. (Bremi and Stauder, 2016a, 2016c; Kroher, 2016; Lindner, 2016a; Teschemacher, 2016b)

8.2 CLOSED INNOVATION

The impact of a CI situation on the properties of an invention is depicted by the figure 17. The figure 17 shows the course of a CI innovation process.

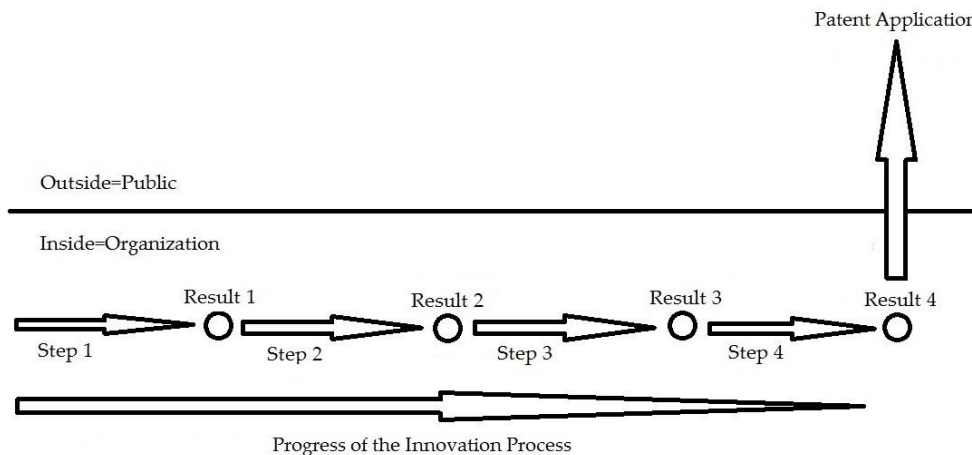


Figure 17: Closed Innovation

There are four steps 1, 2, 3 and 4, which lead to individual results 1, 2, 3 and 4. These steps establish the progress of the innovation process. After the step 4 the innovation is complete and will be filed as a patent application with a patent office. All these four steps 1, 2, 3 and 4 are processed within one organization. Therefore, these steps 1, 2, 3 and 4 are processed “inside”.

The following explanations refer to all corresponding figures of innovation methods.

- **Inside:** This means within the organization, such as a firm or an university.
- **Outside:** This means not within the organization.
- **Public:** That means outside the organization. If an invention gets outside it becomes public. Outside is set equal to public. There is an exception if the invention was created within another organization. In this case the step concerned is outside but not public. Then, the public is excluded from the invention by the boundaries of the other organization.
- **The progress of the innovation process:** This timeline depicts the progress of the innovation process, wherein one single result follows on the preceding result. The innovation of OI can be understood as the addition of the single results 1, 2, 3 and 4 during the innovation process.

- **Step i ($i=1, 2, 3$ and 4):** A step means a contribution to the resulting innovation. From this follows that all steps represent the entire innovation. A single step of the innovation can be inventive or not inventive. At least one step represents a technical contribution to the innovation to be an invention in terms of patent law. The provision of resources, such as machines or money, does not represent a step of the innovation. The individual steps can build on each other so that step 2 is developed on the basis of step 1. But that is not necessary. The individual steps can also be developed independently of each other. But, the combination of all steps forms the innovation. Step 2 is developed chronologically after step 1 and step 3 chronologically after step 2. In addition, it is possible to find out from the respective figure where the respective step was developed, i.e. within the organization or outside the organization or within another organization. The complete innovation process comprises the total of the steps, namely steps 1, 2, 3 and 4.
- **Result i ($i=1, 2, 3$ and 4):** Result 1 derives from step 1, result 2 derives from step 2, and so on and so forth. Result 2 does not comprise result 1. Result 3 does not comprise results 1 and 2. A single result is independent of the preceding results, but it may build on them. Therefore, the resulting innovation is the sum of all results 1, 2, 3, and 4. The result 1, 2, 3 and/or 4 may be inventive in terms of patent law. In this case, the resulting innovation comprises an inventive activity.

The figure 17 depicts the situation of CI. The innovation process is fully embedded into the organization. No single step leaves the realm of this organization. Further, the inventors belong to the organization. Therefore, the inventors are employees of the organization.

8.2.1 Novelty

It has been found that employees of an organization can be assumed to be bound to an express or implied non-disclosure agreement. If an invention becomes known only to the members of the organization, the invention remains new according to patent law. (Lindner, 2016a; Geschka and Meitinger, 2018)

The figure 17 shows that all steps of the innovation process take place within the organization. The finished invention is submitted to a patent office. It can be assumed that the last part of the innovation process, i.e. filing an application with the patent office, does also not endanger the novelty of the invention. Thus, it can be assumed that the novelty of the invention resulting from CI has

not suffered because of the kind of the innovation process. If the invention itself is new, this novelty is not lost because of the innovation process. The CI innovation process has no adverse influence on the novelty of the invention according to the provisions of patent law.(Lindner, 2016a)

8.2.2 Inventive activity

The innovation process takes place entirely within the organization. Therefore, the invention cannot get outwards. There is therefore no possibility that a publication may arise from one's own invention, because the innovation method has in some way made one's own invention known to a person outside the organization.(Kroher, 2016, Rdn. 8-19)

The property of the inventive step of the invention is therefore not affected adversely by the innovation method. If an invention is based on an inventive step from the outset, the use of the innovation method CI does not change anything with respect to the provisions of patent law.(Kroher, 2016)

Therefore, the fact that the innovation process runs completely within the organization guarantees that no problem arises with regard to the requirements of the inventive activity, because there is no access of a third party to the invention.(Kroher, 2016, Rdn. 8-19)

8.2.3 Mention the inventor

The mentioning of the inventor of an invention requires the identification of the inventor. Due to the fact that the invention takes place within the organization, it can be assumed that the organization has access to the respective inventor. It can therefore be assumed that the organization can identify and mention the inventor, since the inventor is a member of the organization. The innovation method therefore should not create any additional difficulties in mentioning the inventor.(Bremi and Stauder, 2016c; Teschemacher, 2016b)

8.2.4 Property in the invention

The inventors are members of the organization. They therefore are employees of the organization. In this situation the organization may take over ownership of the invention concerned in Germany due to GEIA. The organization has a claim to acquire ownership of the invention. Therefore, it can be assumed that it is at least possible for the organization to acquire ownership of the invention.(Meitinger, 2016, p. 532)

8.2.5 Result

Table 2 lists the characteristics of an innovation method according to CI.

Table 2: Evaluation of CI

	Steps inside	Step outside	Problems
Novelty	no Problem	no step outside	no
Inventive Activity	no Problem	no step outside	no
Mentioning	no Problem	no step outside	no
Property	no Problem	no step outside	no

From the point of view of patent law, no problems arise from a CI innovation process.

The “no Problem” in the table for the characteristics “Novelty” and “Inventive Activity” does not mean that the respective invention is new and inventive and therefore patentable, but that the nature of the innovation method chosen does not lead to any additional problems. Therefore, one can say if the invention is new and inventive from the outset, its novelty and inventive step is not endangered by the innovation process.

It is assumed that mentioning the inventors is generally possible because the inventors are members of the organization. It is therefore registered in this category as "no Problem". The "no Problem" for the “Steps inside” for "Property" in the table means that the organization can acquire the property.

The four important characteristics of an invention, which can be influenced by the choice of the innovation method, are not adversely affected by a CI innovation method. A CI innovation method is therefore to be considered neutral from a patent law point of view. (Breimi and Stauder, 2016c, 2016a; Kroher, 2016; Lindner, 2016a; Teschemacher, 2016b)

8.3 VARIANT 1 OF OI

Variant 1 of OI is as follows:

One organization and at least one external inventor

The variant 1 has the characteristics, that there is only one organization, which uses at least one external inventor for creating an innovation.

With the help of the figure 18, which shows the essential characteristics of variant 1, it is determined how this variant of OI affects novelty (Lindner, 2016a) and inventive activity (Kroher, 2016) of the innovation resulting from the innovation process. The additional characteristics, namely mentioning the inventor (Bremi and Stauder, 2016c; Teschemacher, 2016b) and property in the invention (Bremi and Stauder, 2016a), which means the problems of identification of the inventor and the legal transfer of the property in the invention, are also discussed with the help of the figure 18.

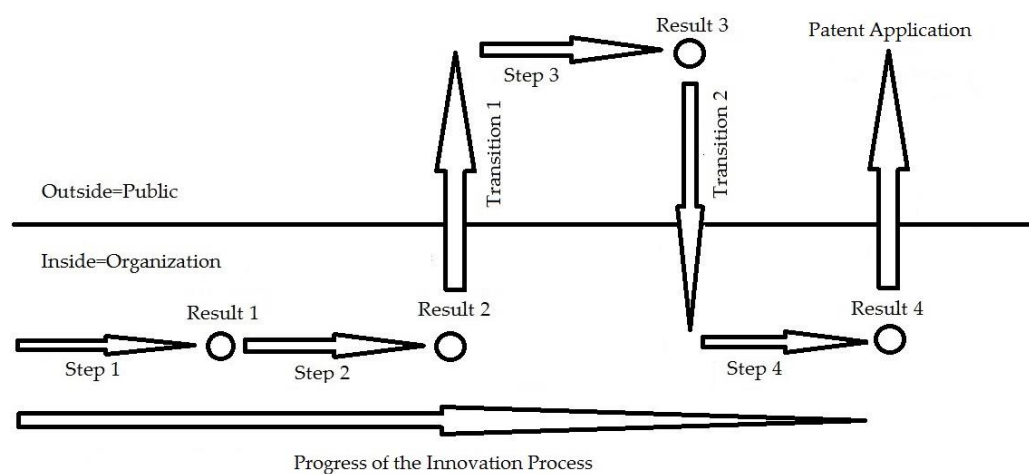


Figure 18: Variant 1 of OI

Variant 1 of OI is characterized by at least one external step of the innovation process, which is step 3. The step 3 leads to the result 3, which is created by an inventor from the outside.

Therefore, the variant 1 of OI comprises the property that the inventor of the result 3 does neither belong to the own organization nor to another organization, which forms a R&D cooperation with the own organization. This inventor acts as an external inventor in the OI innovation process.

Figure 18 shows an innovation process, characterized by:

- **Steps inside:** The innovation process comprises steps 1, 2 and 4 within the organization. From a patent law point of view, these steps can be regarded as irrelevant before the background of the considerations above.
- **Step outside:** At least one step of the innovation process is outside of the organization. This step outside the organization comes from an external

inventor. Therefore, there is at least one external inventor, who gives a contribution to the innovation created by the OI project. This inventor does not belong to the organization.

- **Transition 1:** A transition way from inside to outside
- **Transition 2:** A transition way from outside to inside

Transitions 1 and 2:

If the transitions are transfers by mail postal secrecy applies.(Schäfer, 2004 Rdn. 3) If the transitions are managed by modern means of communication, confidentiality must also be assumed. Even if the results of the steps of the innovation process are transferred by email in plain text, it can be assumed that the content has not been made available to the public. An email transmitted via the internet does not violate the novelty requirement.(EPO, 2012b; Moufang, 2017b Rdn. 15-22) This can be applied on both transitions 1 and 2. Therefore, the transitions 1 and 2 do not endanger the patentability of the resulting invention. As a conclusion the transitions 1 and 2 are not relevant from the standpoint of patent law.

Step outside:

Step 3 is outside the organization. In addition, step 3 is not within another organization. Therefore, the step 3 is not encapsulated and thus the result 3 of step 3 forms part of the state of the art. The inventor of result 3 is free and independent in his actions. He can therefore have drawn inspiration for his contribution from any source. Moreover, he is not limited in sharing his contribution with any other persons. Therefore, no express or tacit confidentiality agreement can be assumed.(Geschka and Meitinger, 2018) Therefore, it is assumed, that there is no difference between the contribution of the external inventor and the public prior art.

There can be four different assumptions, depending on the external step 3 and the internal steps 1, 2 and 4. These different assumptions are assessed according to the effects on novelty, inventive step, mentioning the inventor and property in the invention of the resulting innovation of the innovation method due to variant 1 of OI.

In a first situation, result 3 of step 3 represents the only inventive activity of the resulting invention of the OI project, wherein this inventive activity at least exists at the time point of creation of result 3 (assumption 1). Alternatively, step 3 is inventive at its creation and one or more of steps 1, 2 or 4 are also inventive (assumption 2). In another possible situation, step 3 is not inventive, but at least

one of steps 1, 2 or 4 (assumption 3). A fourth possible variant is the situation that none of the steps 1, 2, 3 and 4 of the innovation process is inventive (assumption 4).

Inventive means inventive in the sense of patent law, i.e. the result of the step concerned does not belong to the prior art and is not obvious with regard to the state of the art. An inventive contribution is therefore new and based on an inventive activity within the meaning of patent law as of the moment it is created.

Assumption 1

Only result 3 of step 3 is an inventive contribution in terms of patent law. The results 1, 2 and 4 are not inventive.

Novelty

Step 3 is outside the organization. In addition, step 3 is not embedded within another organization. The result 3 of step 3 is therefore accessible to the public and not new in terms of patent law. According to the considerations above, only if the external inventor is bound to an implied or explicit non-disclosure agreement can the result 3 fulfill the novelty criterion of patent law. (Kraßer and Ann, 2016, §16 Rdn. 32)

The question of whether the external inventor is bound to a non-disclosure agreement can only be clarified on a case-by-case basis, taking into account the particularities of the individual situation. Ultimately, such clarification can only be made by a court. The direction in which this decision is taken cannot be anticipated. Only an evaluation of the current case law can give an indication of the possible decision. However, the court in question may also make a completely different decision. (Lindner, 2016a, Rdn. 25)

For this reason, step 3 must be regarded as fundamentally critical in the sense of the novelty criterion of patent law. For this reason, it is assumed that the result 3 of step 3 is deemed to be not new in the sense of the patent law, because of the peculiarities of the innovation method due to variant 1 of OI.

Inventive activity

Step 3 is not new according to the considerations above. The result 3 of step 3 is therefore part of the state of the art. (Lindner, 2016a, Rdn. 13-20) Therefore, it is not possible to use the result 3 of step 3 to justify the inventive activity of the resulting innovation of the innovation method. Given the assumption that the

result 3 of step 3 is the only inventive step, the resulting innovation is not based on an inventive activity.

Mentioning the inventor

The result 3 of step 3 is developed by an external inventor. The external inventor has therefore not developed result 3 in the organization's premises. It is also possible that the external inventor did not use the organization's resources, especially its installations and machines. The attachment of the external inventor to the organization can be very loose. For example, it could even be that the inventor is not known to the organization at all. It is possible that the organization only knows an internet alias name of the inventor. Overall, it can therefore be assumed that the designation of the inventor may cause difficulties.(Breimi and Stauder, 2016c; Teschemacher, 2016b)

Further constellations are possible that could prevent the organization from getting the inventor's true identity. It can therefore be assumed that mentioning the inventor, i.e. assigning the inventor to the invention, can be difficult. It does not necessarily have to be problematic to mention the inventor, but it can be. At the very least, the organization cannot check whether there is a difficult situation, since the organization has no direct access to the inventor, because the inventor is not a member of the organization.

Property in the invention

Due to §6 sentence 1 PatG and article 60(1) sentence 1 EPC the inventor acquires ownership of the invention. Therefore, the organization does not initially have any ownership rights.(Moufang, 2017l; Visser, 2017, pp. 129–131) Of course, the organization strives for ownership of the invention. Why else would the organization have initiated the OI project? The organization could feel deprived of the fruits of its work if it does not acquire ownership of the invention.

The problem of ownership of the invention is well known. Especially, two possible solutions are already being used in practice. Attempts are made to transfer ownership of the invention from the inventor to the organization by means of General Trading Conditions (GTCs) or by advance transfers. Another alternative is at least discussed in the literature, namely a transfer of ownership according to the principle of "good faith" in accordance with §242 BGB.(Meitinger, 2016)

In accordance with German law, an argument based on §242 BGB (German Civil Code) "good faith" can be considered. However, in this case it must be almost

unreasonable that the organization is not taken into account. The invention must be based on considerable work carried out by the organization in order for §242 BGB to be applicable. This is usually not the case. An argumentation in “good faith” is therefore not very promising.(Meitinger, 2016, p. 535)

One further possibility is to agree upon a transfer in advance. The transfer in advance means that the transfer of rights takes place before the invention itself is created. However, a precondition for a pre-transfer is that the subject matter to be transferred in advance is described in detail at the time of transfer.(BGH, 1955, p. 289; Kraßer and Ann, 2016, §19 Rdn. 14)

The reason for this condition is that the parties should be clear as to what the prior transfer refers to.(Kraßer and Ann, 2016, §19 Rdn. 14) No ambiguity regarding the subject matter of the agreement may exist at the time of closing the agreement. Otherwise, no valid agreement would have been reached anyway.

Alternatively or in addition, an attempt can be made to reach a regulation by General Trading Conditions (GTCs). However, legal regulations for GTCs must be regarded. For Germany, the GTC regulations are included in the German Civil Code. In this context, §§ 305c(1) and 307 BGB are of particular importance.

§ 305c(1) BGB states that there must not be any surprising clauses in GTCs. It is not so long ago that it was disputed whether intellectual creations such as books or inventions were actually property at all.(Ann, 2004) In the meantime it can be assumed that this insight is common knowledge. Clauses in GTCs which therefore provide for the transfer of ownership without appropriate remuneration of the inventor are therefore invalid.

§307 BGB stipulates that clauses in the GTC which result in an unreasonable disadvantage are not effective. If the inventor's rights are taken without appropriate compensation, such an unreasonable disadvantage may exist.(Meitinger, 2016, p. 535)

However, this is a case-by-case examination. Acquiring ownership is therefore an additional difficulty for the organization.

Summary

The following table 3 summarizes the results for the assumption 1 of the variant 1 of OI.

Table 3: Evaluation of assumption 1 of variant 1

	Steps inside	Step outside	Problems
Novelty	no Problem	Problem	yes
Inventive Activity	no Problem	Problem	yes
Mentioning	no Problem	Problem	yes
Property	no Problem	Problem	yes

Assumption 2

At least one of the steps 1, 2, 4 is inventive as well as result 3 of step 3 at the time point of its creation. In this case, step 3, which is developed by the external inventor, and at least one further step 1, 2 and/or 4 created by an internal inventor are inventive. This means that at least one internal inventor of the organization together with the external inventor have made inventive contributions to the resulting innovation of the OI project.

Novelty

The step 3 is not encapsulated and therefore, the result 3 of step 3 loses novelty during the innovation process. Therefore, this step 3 does form part of the state of the art at the end of the innovation process.(Lindner, 2016a)

On the other hand, at least one inventive step of the innovation process remains new in spite of the characteristics of the innovation process. This step is kept secret, because it was done within the organization. For this reason, the entire invention is new with respect to patent law.

Inventive activity

The step 3 is not encapsulated and therefore, the step 3 loses novelty. Therefore, this step 3 forms part of the state of the art at the end of the innovation process. Since the contribution of this step 3 is not new, it cannot be taken into account when assessing the inventive activity.(Kroher, 2016) On the other hand, at least one step of the innovation process is new and inventive. This step leads to the inventive activity of the invention in question.

Mentioning the inventor

The invention has at least two inventors, with one inventor not belonging to the organization. It is not problematic to mention the internal inventor, because this inventor belongs to the organization. However, it can be problematic to mention the external inventor, as identification of an external inventor can be difficult.(Bremi and Stauder, 2016c; Teschemacher, 2016b)

The identification of the external inventor does not have to be difficult, but it can be. It depends on the specific individual case. On the other hand, it can be assumed that the designation of the internal inventor is not a problem.

Property in the invention

In this case, there is a community of inventors, whereby the ownership of the invention belongs to the external inventor and the internal inventor together. The inventorship of the internal inventor does not result to any problems because of the property in the invention. Quite differently for the external inventor, who can cause problems according to the above considerations. (Bremi and Stauder, 2016a, Rdn. 7-10) Overall, the situation arises that the characteristic of the property in the invention can lead to a problematic legal constellation.

Summary

The following table summarizes the results.

Table 4: Evaluation of assumption 2 of variant 1

	Steps inside	Step outside	Problems
Novelty	no Problem	no Problem	no
Inventive Activity	no Problem	no Problem	no
Mentioning	no Problem	Problem	yes
Property	no Problem	Problem	yes

Assumption 3

At least one of the steps 1, 2, 4 is inventive and the step 3 is not. In this situation, an external person makes a contribution to the invention, but this is not relevant from a patent law point of view.

Novelty

The important step leading to novelty is one or several of the steps 1, 2 and/or 4, which take place within the organization. The novelty of the resulting invention is therefore not adversely affected by the innovation method. (Lindner, 2016a)

Inventive activity

In this case, the inventive step is not generated by step 3, but by one or more of the steps 1, 2 and/or 4. The steps 1, 2 and 4 are located within the organization and are therefore uncritical with regard to the criterion of the inventive step of patent law. (Kroher, 2016) Therefore, the resulting invention is based on an inventive activity.

Mentioning the inventor

The originator of step 3 is not an inventor, since the result 3 of step 3 is not inventive. The inventors are the originators of steps 1, 2 and/or 4, who are members of the organization. The determination of the identity of the inventors should be no problem.(Bremi and Stauder, 2016c; Teschemacher, 2016b)

Property in the invention

The inventors are members of the organization. The acquisition of ownership of the invention should therefore not be a problem for the organization.(Bremi and Stauder, 2016a)

Summary

The following table summarizes the results.

Table 5: Evaluation of assumption 3 of variant 1

	Steps inside	Step outside	Problems
Novelty	no Problem	no Problem	no
Inventive Activity	no Problem	no Problem	no
Mentioning	no Problem	no Problem	no
Property	no Problem	no Problem	no

Assumption 4

No step is inventive. In this case, patentability is excluded from the outset, since no step in the innovation process represents an inventive contribution.

Novelty

All steps of the innovation process are state-of-the-art technology. Due to the nature of step 3 being outside the organization, the situation cannot be changed, especially it cannot be more worse. The resulting innovation cannot be new.(Lindner, 2016a)

Inventive activity

No step is inventive. The openness of the OI approach cannot cause any further deterioration. The resulting innovation cannot be based on an inventive activity.(Kroher, 2016)

Mentioning the inventor

There are no inventive contributions, therefore there are no inventors. The provisions of patent law governing the designation of inventors are not relevant.(Bremi and Stauder, 2016c; Teschemacher, 2016b)

Property in the invention

The resulting innovation is part of the state of the art. Therefore, the innovation does not generate legal rights due to patent law.(Bremi and Stauder, 2016a)

Summary

The following table 6 summarizes the results.

Table 6: Evaluation of assumption 4 of variant 1

	Steps inside	Step outside	Problems
Novelty	no Problem	no Problem	no
Inventive Activity	no Problem	no Problem	no
Mentioning	no Problem	no Problem	no
Property	no Problem	no Problem	no

8.3.1 Novelty

For the variant 1 of the OI innovation methods, the effect of the properties of the OI project on the novelty of the resulting invention was investigated in four different situations (assumptions 1 to 4). No adverse effect was determined for assumptions 2, 3 and 4, but such an adverse effect was found for assumption 1. Therefore, no novelty of the invention can be assumed for this assumption 1.

Which assumption applies in a concrete case, i.e. how the results 1, 2, 3 and 4 have to be evaluated before the background of the prior art can only be determined in an individual case evaluation. There can be no general rules for this case-by-case assessment. For this reason, the worst value is assumed to carry out a prudent evaluation. It must therefore be assumed that an OI project due to variant 1 questions the novelty of the resulting invention.(Lindner, 2016a)

8.3.2 Inventive activity

In the case of assumption 1, a possible inventive step may be destroyed by the OI project. It remains unchanged for assumptions 2, 3 and 4. It is therefore assumed that an OI project due to variant 1 can impair the inventive activity.(Kroher, 2016)

8.3.3 Mention the inventor

The identification of the inventor's identity is a prerequisite for meeting the legal requirements after mentioning the inventor. For assumptions 1 and 2, identification of the inventors can be difficult. For assumptions 3 and 4, identification can be assumed as possible or it is not necessary. All in all, it must therefore be assumed that there are difficulties in identifying the inventors. For this reason, it must be assumed that the mentioning of the inventors is difficult. (Bremi and Stauder, 2016c; Teschemacher, 2016b)

8.3.4 Property in the invention

Assignment of ownership of the invention is a problem with assumptions 1 and 2. The characteristic property of an invention should therefore be regarded as problematic for this variant of OI. (Bremi and Stauder, 2016a)

8.3.5 Result

There can be several problems with patent law. First, identification of external inventors can be difficult. Therefore, mentioning the inventors can be problematic. Another problem of an external inventor is the problem of property in the invention, because the invention belongs to the inventor and not to the organization.

Novelty as well as the inventive activity can be critical. Eventually, granting a patent is not possible because of the properties of the innovation method.

The novelty of variant 1 of OI is a summary of the values for the novelty of the four tables of assumptions 1, 2, 3 and 4, whereby the worst value prevails. The inventive activity, the mentioning of the inventor and the property in the invention of variant 1 is also a summary of the values of the four tables of assumptions 1, 2, 3 and 4, whereby the worst value prevails.

Table 7: Evaluation of variant 1

	Steps inside	Step outside	Problems
Novelty	no Problem	Problem	yes
Inventive Activity	no Problem	Problem	yes
Mentioning	no Problem	Problem	yes
Property	no Problem	Problem	yes

OI as crowdsourcing

Crowdsourcing, as far as it serves to generate inventions, can be seen particularly as belonging to the innovation method due to variant 1 of OI. Crowdsourcing as especially an important subgroup of variant 1 is examined in more detail. (Geschka and Meitinger, 2016)

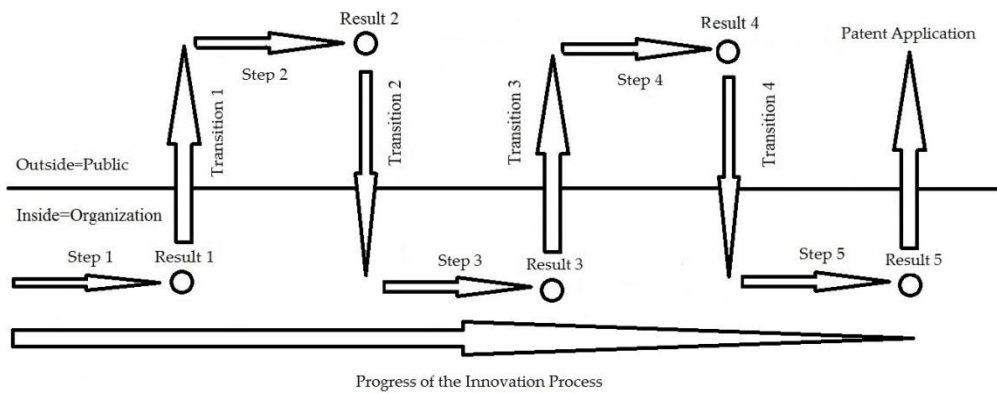


Figure 19: First variant of crowdsourcing

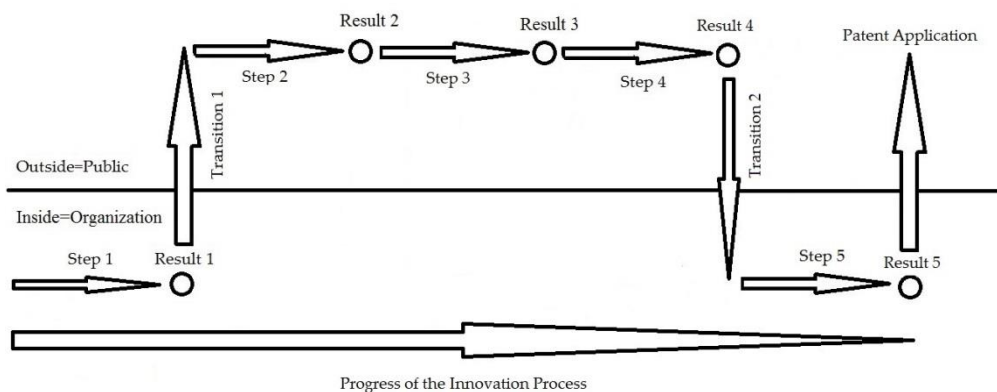


Figure 20: Second variant of crowdsourcing

The figures 19 and 20 depict different variants of crowdsourcing as OI. The figures 19 and 20 differ from the previous situation of variant 1 of OI only in that there are several external steps instead of just one. By this difference it is stated that crowdsourcing can comprise a huge amount of external inventors. This difference does not give a fundamentally different situation. The statements to the figure 18 therefore also apply to the situations of the figures 19 and 20.

Therefore, there are the same results as for the situation of figure 18:

Table 8: Evaluation of Crowdsourcing

	Steps inside	Step outside	Problems
Novelty	no Problem	Problem	yes
Inventive Activity	no Problem	Problem	yes
Mentioning	no Problem	Problem	yes
Property	no Problem	Problem	yes

8.4 VARIANT 2 OF OI

Variant 2 of OI is characterized by:

Two or more organizations and internal inventors

The variant 2 is characterized by the properties of two or more organizations, wherein the inventors belong to the organizations involved. Therefore, there is no external inventor. This variant can be called as firm-to-firm OI (Hagedoorn and Zobel, 2015, p. 1050), wherein this variant of OI also comprises OI with different organizations than firms. For example, firm-to-firm OIs can be found between two universities or between one company and one university or between any two or more other kinds of organizations. Firm-to-firm OI means that the innovation process runs exclusively within these two or more organizations. It can be said that the firm-to-firm OI innovation process is embedded in several organizations.

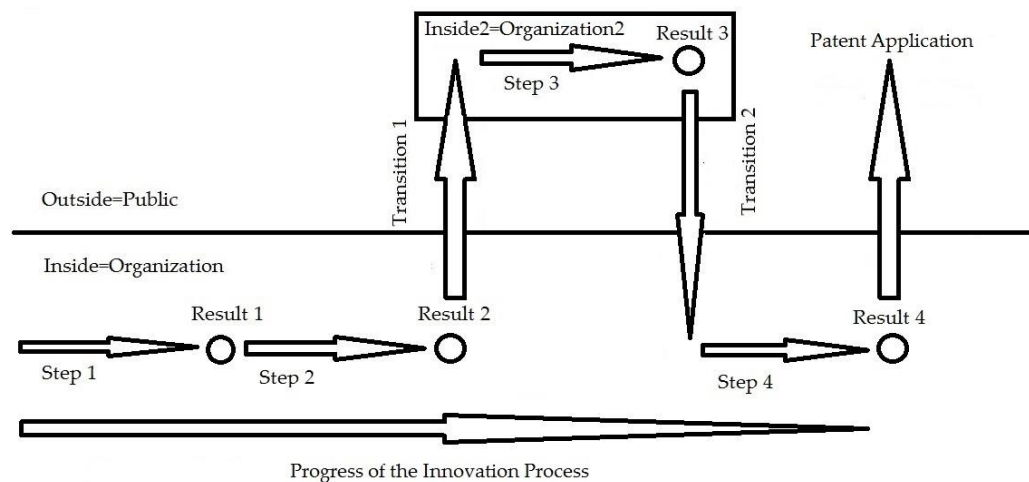


Figure 21: Variant 2 of OI

The figure 21 shows a firm-to-firm OI, which is a R&D cooperation of several organizations, for example of two firms (firm 1: inside and firm 2: inside 2).

Explanations concerning the figure 21:

- **Inside 2:** This means that there is an additional organization besides the first organization. Inside 2 means inside this further organization.

The figure 21 shows a situation where one step of the innovation process takes place outside the first organization but within a second organization. Therefore, all steps of the innovation process are embedded in organizations.

The situation due to figure 21 is characterized as follows:

- At least one step of the innovation process is outside the first organization, wherein this step is encapsulated to the outside world by an additional organization. Encapsulated means especially that the step outside is within the second organization. Therefore, the step outside is shielded to the outside world.
- A transition way from inside to outside, which means from the first organization to the second organization
- A transition way from outside to inside, which means from the second organization to the first organization.

With this innovation method, all steps are shielded from the public. Steps 1, 2 and 4 are integrated within the first organization and step 3 is integrated within

the second organization. The results obtained with CI are therefore directly transferable to this variant of OI.

8.4.1 Novelty

It is assumed that it makes no difference whether a step of an innovation process is carried out in a first or a second organization. For this reason, it can be assumed in both cases that the respective step of the innovation process is to be viewed as being isolated from the outside world. All steps of the innovation process are encapsulated. Further, the case law assumes that there is a common interest of the firms involved in the R&D cooperation to keep the invention secret.(EPO, 1995b, 1996c) For this reason, this variant of OI does not affect the novelty criterion of patent law adversely.(Lindner, 2016a, Rdn. 13-20, 25)

8.4.2 Inventive activity

Due to the encapsulation of all steps of the innovation process, it can be assumed that a possible inventive step of the invention will not be impaired.(Kroher, 2016)

8.4.3 Mention the inventor

All steps of the innovation process take place within the organizations. It should therefore not be a problem to identify the inventors and to mention the inventors, because the inventors are members of the respective organizations.(Bremi and Stauder, 2016c; Teschemacher, 2016b)

8.4.4 Property in the invention

For the reason that the inventors belong to at least one organization, the problem of the property in the invention is also solved, since the GEIA hereby assigns ownership of the invention to the corresponding employer.(Keukenschrijver, 2016k; Meitinger, 2016, p. 532)

8.4.5 Result

The following table 9 summarizes the results.

Table 9: Evaluation of variant 2

	Steps inside	Step outside	Problems
Novelty	no Problem	no Problem	no
Inventive Activity	no Problem	no Problem	no
Mentioning	no Problem	no Problem	no
Property	no Problem	no Problem	no

There are no steps of the innovation process outside the organizations. Therefore, all steps of the innovation process can be regarded as encapsulated. Encapsulated steps and transition ways do not lead to relevant differences in comparison to CI with respect to patent law. Therefore, from the standpoint of patent law a R&D collaboration of two or more organizations, named as firm-to-firm OI (Hagedoorn and Zobel, 2015, p. 1050), does not have different characteristics in comparison to a CI innovation process.

8.5 VARIANT 3 OF OI

The variant 3 of OI is as follows:

Two or more organizations and at least one external inventor

By means of the figure 22, which shows the essential characteristics of OI as variant 3, it is determined how this kind of OI affects novelty, inventive activity and inventorship as properties of an invention resulting from the innovation process.

This variant of OI has the characteristics of two or more organizations and at least one external inventor. Variant 3 can be understood as a sequential combination of variants 1 and 2.

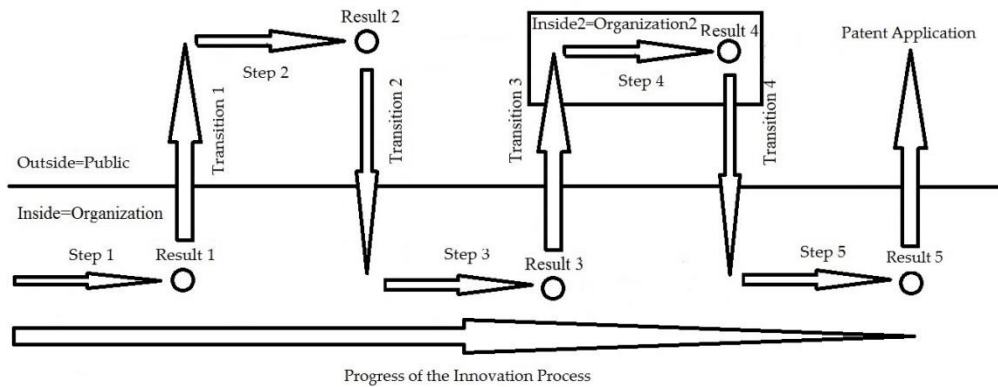


Figure 22: Variant 3 of OI

Since variant 3 can be seen as a combination of variants 1 and 2, the tables of variants 1 and 2 can also be combined to obtain the table valid for variant 3. It must be noted here that the worst results are those that prevail. This means that if a position in one table is marked "no Problem" and in the other table the same position is designated as "Problem", the "Problem" label must finally be set for this position in the merged table. Only if there is "no Problem" in both tables, "no Problem" is set at the corresponding position in the resulting table. The worst-case scenario is therefore always assumed, since the concrete situation is not known.

Table 10: Evaluation of variant 1

	Steps inside	step outside	Problems
Novelty	no Problem	Problem	yes
Inventive Activity	no Problem	Problem	yes
Mentioning	no Problem	Problem	yes
Property	no Problem	Problem	yes

Table 11: Evaluation of variant 2

	Steps inside	Step outside	Problems
Novelty	no Problem	no Problem	no
Inventive Activity	no Problem	no Problem	no
Mentioning	no Problem	no Problem	no
Property	no Problem	no Problem	no

The worst results must be taken into account. The resulting table is as follows:

Table 12: Evaluation of variant 3

	Steps inside	Step outside	Problems
Novelty	no Problem	Problem	yes
Inventive Activity	no Problem	Problem	yes
Mentioning	no Problem	Problem	yes
Property	no Problem	Problem	yes

8.6 ANSWER TO THE SEVENTH RESEARCH QUESTION

Summarizing the above it can be said if there are organizational boundaries for an innovation process there is no problem with respect to patent law. In case the innovation process is “open” there are difficulties, because of problems with identification of inventors and therefore mentioning the inventors, problems because of property in the invention, possible loss of novelty and shortcomings of inventive activity.

Therefore, in case there is an external inventor involved, there may be problems with patent law. If there is no external inventor, there are no problems with patent law. Therefore, the characteristic of having an external inventor is decisive from the standpoint of patent law.

CI is not problematic from the point of view of patent law. If, on the other hand, an external inventor is added to the innovation process, the CI process transforms to an OI with-an-external-inventor innovation process and difficulties arise from the point of view of patent law.

Secondly, a firm-to-firm OI innovation process is not a patent law problem. If, on the other hand, an external inventor is added to the firm-to-firm OI innovation process, a firm-to-firm OI with-an-external-inventor innovation process results and the patent law difficulties arise.

From the standpoint of patent law, there are two groups of innovation methods:

- **Group 1**
Closed Innovation and firm-to-firm OI
- **Group 2**
OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor

In addition, two pairs of innovation methods could be identified, which represent opposites from a patent law perspective:

- **CI versus OI with-an-external-inventor and**
- **firm-to-firm OI versus firm-to-firm OI with-an-external-inventor.**

Further, the innovation methods of group 1 are in line with the patent law, whereas the innovation methods of group 2 are not in line with the patent law.

9 OI AND PROHIBITION RIGHTS

The restrictive impact of prohibition rights of patent law on the use of innovations and on innovation processes is well-known.(Arrow, 1962) Prohibition rights of patent law can affect an innovation process in different ways. On the one hand, the own innovation process can result in third party patents, because the own innovation process initiated the development of a third party invention. This may not be intended. The resulting patent of the third party invention can lead to the situation that the own innovation cannot be used.(Luginbühl, 2016; Rinke, 2017f) Secondly, an invention protected by a third party patent can flow in the innovation process. The own innovation can result to an infringement of the third party patent. Further, the prohibition rights may prohibit the innovation process itself as an inadmissible use of a legally protected invention.(Rinke, 2017b Rdn. 12)

Infringement of a patent should be avoided, as this leads to costs and efforts. If you infringe a third party patent through your innovation, the use of the own innovation can be prohibited. If an own patent is infringed, it can be laborious to restore the state of competition that would exist without infringer.(Keukenschrijver, 2016d; Voß, 2017) An innovation method that per se does not lead to any additional problems regarding the prohibition rights of patent law is therefore advantageous.

The characteristics of an invention have led to a grouping in chapter 8. Now it is to be checked whether this grouping also makes sense from the point of view of prohibition rights of patent law.

9.1 EIGHTH RESEARCH QUESTION

The various innovation methods are examined to determine which groups result from the viewpoint of prohibition rights of the patent law.

Eighth research question

Which are the groups of innovation methods from the standpoint of the prohibition rights of patent law?

9.2 PROHIBITION RIGHTS

According to §9 sentence 2 PatG, the owner of a patent can prohibit anyone from using his invention. This paragraph defines the prohibition of direct infringement. A direct infringement exists if all the features of the patent are met by the patent-infringing use.(Scharen, 2015; Rincken, 2017f) According to §10(1) PatG, indirect infringement is also prohibited. There is an indirect patent infringement if not all, but the essential features of the patent are infringed.(Rincken, 2017a)

There are no European regulations from which prohibition rights arise. Article 64(2) EPC alone defines more precisely that the scope of protection of a process claim must be extended to products that result directly from the process. Therefore, according to article 64(1) EPC, the respective national prohibition rights must be applied.(Luginbühl, 2016 Rdn. 2-5)

If there are information channels between the own organization and the outside world parts of the invention or the entire invention can be carried outwards and possibly be patented very early by a third party. In this case, the third party has filed a patent application, whereby the own innovation becomes a patent infringement.

In case a third party patent flows in the own innovation process the own innovation infringes this third party patent. On the other hand if the own innovation will be filed earlier than the respective third party invention then the third party becomes an infringer of the own patent. In this case it is necessary to fight the third party patent or patent application in order to regain the previous competitive situation. In this thesis only the case is considered that the third party invention was filed with the patent office before the own invention is filed, since this case represents the highest legal risk. In this case, the own innovation process may have been completely in vain, since the own innovation cannot be used.

9.3 ANTITRUST LAW

Patents can lead to economic monopolies.(Posner, 1975, p. 823; Gilbert and Newbery, 1982, pp. 515–517, 524; Harris and Vickers, 1985, p. 461; Heinemann, 2002, pp. 442–444; Smith, 2002, pp. 509–510; Blind *et al.*, 2006, p. 671; Frambach, 2018, p. 170) One example is the company Xerox. Xerox Corporation had a monopoly on the production of dry copiers in the 1950s to 1970s. This economic position can be attributed in particular to patents.(Beck, 2008, p. 139, 2011, p.

177; Baumol and Blinder, 2011, pp. 220–221; Ulich and Wülser, 2012, pp. 212–213)

The monopolies resulting from patents can be regarded as barriers to market entry. (Priest, 1977; Kantzenbach and Kruse, 1989, p. 75; Langinier and Moschini, 2002, p. 31; Freiling and Reckenfelderbäumer, 2010, p. 162; Menninger and Wurzer, 2014, pp. 170–171; Offenburger, 2014, p. 6) Therefore, patents were viewed critically by economists. It is assumed that monopolies by patents damage competition. (Machlup and Penrose, 1950; Cezanne, 2005, pp. 164–165; Smith, 2016, p. 51)

Because of the prohibition rights, patents can have considerable economic power. This market power can be abused. (Burk and Lemley, 2009, p. 3; Sweeny, 2009, p. 80; Thiele, Blakeway and Hosch, 2010, p. 186; Hüttermann, 2013, p. 185; Köllner and Weber, 2014, pp. 106–114)

Further, patents are suspected of benefiting the major market players. The increased financial resources of these major market players will allow more extensive R&D activities leading to more patents. The sheer size alone therefore makes an increasing concentration of market power possible. Small businesses are in the lurch. In this sense, one could assume that patent law by its very nature is anti-competitive. (Bußmann, 1977, pp. 122–123)

However, these considerations may not correspond to reality in every situation. In fact, the criterion of inventive step under §4 PatG and article 56 EPC prevents too large scopes of protection from being claimed. It therefore follows that, with special exceptions, such as patents, which describe basic technologies or those which protect standards, there are sufficient possibilities to circumvent a patented invention. It is therefore typically not possible to force competitors out of the market for good by means of patents. (Peifer, 2001, pp. 350–351, 359–365; Neuburger, 2005, p. 15; Picht, 2014; Asendorf and Schmidt, 2015a; EuGH, 2015; Keukenschrijver, 2016j; Kraßer and Ann, 2016)

From a general point of view there is no conflict between patent law and antitrust law. Antitrust law and patent law are initially neutral. Both areas of law serve to promote a state's economic status. The possibility of patenting is intended by the lawmaker to encourage companies to invest in research in order to promote technological progress. Technological progress fosters the economic welfare of a state. Regular use of patents is not subject to regulation due to

antitrust law. But, anti-competitive behaviour must be prevented by antitrust law.(Klawitter, 2016, Rdn. 1-7)

The fact that a well-working market and patent law are not per se contradictory can be recognized by the fact that small and medium-sized enterprises can hold their own against the market power of large companies, particularly through patents. In such cases, patents and in particular the prohibition rights of patents maintain effective competition. It is therefore important to carry out an analysis of the market situation in order to ascertain that competition has been indeed damaged before applying antitrust law.(Kellermann, 1958, pp. 581–582)

There is a national German antitrust law, the GWB, and antitrust provisions for the member states of the EU, which are part of the TFEU. German and European antitrust provisions are harmonized, so that European case law can also be used to interpret the requirements of national antitrust provisions.(Diemer, 2017)

9.3.1 Relationship between patent law and antitrust law

The relationship between antitrust law and patent law is a mirror image of the development of the generally accepted economic market model. In a first phase, around the beginning up to the middle of the last century, a patent was considered to be outside competition policy. Therefore, it seems to be no need to curtail the effects of a patent through antitrust law.(Bußmann, 1977)

In a second phase the "perfect market" concept was aimed for. In this market concept no market participant should exert a noticeable influence on market activity. This is a concept in which market participants are regarded as static and weak. An economic monopoly based on a patent had to appear to be a disturbance in this concept. Accordingly, patent law was viewed critically from an economic point of view.(Axster and Osterrieth, 2018, Rdn. 141-145)

In the meantime, the economic market concept has been further developed. Today, one assumes a dynamic action of the market participants, or rather it is even desired that a dynamic market results. Given the dynamic nature of market developments, it is quite possible that individual market participants could also exert an increasing influence on the market. Such an increase can, for example, result from patents. A core element of the modern market concept is innovation. Patent law is specifically designed to stimulate innovation by rewarding through an economic monopoly. As a result, patents are no longer seen as a contradiction to antitrust law.(Axster and Osterrieth, 2018, Rdn. 146-153)

Patents are therefore not fundamentally incompatible with antitrust law. However, this finding must not lead to the assumption that patents per se are harmless. Instead, the effects of patents must also be examined under antitrust law. One cannot leave patents and their prohibition rights to oneself. Antitrust law must also be able to limit the effects of patents where there are serious market restrictions.(Kellermann, 1958, p. 582)

9.3.2 GWB

The German GWB is a ban on cartels and has been harmonised with the European ban on cartels. If the European antitrust provisions are not relevant, as there is no infringement that affects several EU member states, the GWB can take effect.(Diemer, 2017) EU antitrust provisions are especially relevant if trade between the EU member states is significantly affected or if this is to be assumed. Small cartels or cartels that only operate nationally will be covered by national antitrust law. European antitrust provisions do not exclude national antitrust law.(Osterrieth, 2015b Rdn. 702)

GWB and European antitrust law refer to "companies". However, companies are to be interpreted in such a way that economically active natural persons, partnerships or corporations, such as AGs or GmbHs, are also meant. Individual persons are also not excluded from the effects of antitrust law. Consumers are not covered by the term company due to antitrust law. However, scientists whose work serves a commercial purpose are also market participants.(Diemer, 2017)

Due to antitrust law there are agreements, resolutions and concerted practices. Agreements in accordance with antitrust law are civil law contracts that result from concurring declarations of intent. However, the focus is on the actual commitment and not only on the legal commitment will. Economic prudence and moral pressure because of a sense of solidarity can also be seen as an agreement in the sense of antitrust law. Resolutions are the decisions of the body of an organization duly taken in accordance with the relevant right of corresponding association. Resolutions differ from agreements in that resolutions must have been reached on the basis of association-based rules. Antitrust law also covers concerted practices. A concerted practice means a restrictive interaction which does not have to be based on a binding commitment.(Diemer, 2017)

Agreements, resolutions or concerted practices will be sanctioned if they have the effect or purpose of noticeable restrictions on competition. There is a competitive purpose if the restriction of competition is part of the contract, the resolution or the concerted action. A competitive effect is deemed to exist if the restriction of competition is not explicitly intended, but if the restriction does indeed have an effect on the market.(Diemer, 2017)

§1 GWB prohibits agreements between undertakings, decisions of associations of undertakings and concerted practices which have as their object or effect the prevention, restriction or distortion of competition. It is also possible that a concrete competitive situation can be described by two or all three types.(Diemer, 2017)

Antitrust law is focused on a relevant market. The relevant market is to be determined for assessing the restriction of competition. Only in relation to a defined market can it be determined whether there is a noticeable restriction of competition.(Diemer, 2017)

9.3.3 TFEU

All agreements between undertakings, decisions of associations of undertakings and concerted practices which are likely to affect the internal market between at least two members of the EU and which have as their object or effect the prevention, restriction or distortion of competition of this internal market are prohibited by the article 101(1) TFEU. There is a restriction of competition due to article 101(1) TFEU if a significant limitation of freedom of decision of a competitor or the firms themselves can be identified. Article 102 sentence 1 TFEU prohibits abuse of a dominant position. Therefore, there is an infringement of the antitrust law of TFEU if there is a dominant position and an abuse of that position.(Conrad, 2016 Rdn. 306-307)

A precondition for the relevance of article 101(1) TFEU is that competition between EU member states is significantly impaired. Several EU member states must therefore be affected by the injury to competition. The impact of market influence is significant in the case of corresponding amounts of sales of the companies that are damaging the competition in relation to the relevant market.(Diemer, 2017 Rdn. 47-50)

A patent grants the exclusive right to use an invention. This may create a dominant position. However, it should be noted that a patent does not necessarily imply a dominant position. There may be alternative solutions to the

patent-protected invention, which is why market dominance would have to be denied. An important exception to this statement are patents on standards, which can lead to dominant economic positions.(Picht, 2014; EuGH, 2015)

On the other hand a company's dominant position can be assumed by the fact that it is able to act to a large extent independently of other market players. A complete elimination of market mechanisms is not necessary to specify a dominant position.(Weiß, 2016b Rdn. 7-9)

Block exemption regulations (BERs)

Block exemption regulations are derived of article 288 TFEU, which describe different categories of anticompetitive activities like agreements between companies and concerted practices of companies, which will be excluded from the prohibition of anticompetitive conduct under article 101(1) TFEU. Block exemption regulations specify conditions due to article 101(3) TFEU. In this case, these agreements are no longer considered anti-competitive measures.(Ullmann and Deichfuß, 2015 Rdn. 257-258)

European antitrust law includes two block exemption regulations on research and development. It is particularly important for the thesis that TT-BER stipulates that licensees may not be restricted in their inventive activity.(Ullmann and Deichfuß, 2015 Rdn. 264) Further, R&D-BER determines that cooperation partners in a R&D cooperation must not be hindered in their development activities.(Smielick, 2017) Due to §2(2) sentence 1 GWB, TT-BER and R&D-BER are also relevant for the application of national antitrust law.(Nordemann, 2016 Rdn. 4)

TT-BER

Licenses can be used to transfer technology. A license can be derived from a patent. Licensing can be such that it violates antitrust law. A license can be used to establish a prohibition right against the licensee. Under antitrust law, this prohibition right may not exceed that of the patent itself. Otherwise, the situation is contrary to antitrust law.(Ullmann and Deichfuß, 2015 Rdn. 253, 262)

For example, a license agreement could prohibit a licensee from using replacement materials for the patented product not from the patent owner, even though these replacement materials are not covered by the patent. In this way, the prohibition rights of the patent would be extended beyond the legal provisions. This constitutes an abusive license agreement. Therefore, a patent can establish an economic monopoly in which there is a risk that the monopoly

will be extended beyond the legal provisions. The task of antitrust law is to counteract this risk.(Körber, 2013b, 2013a; von Falck and Apetz, 2017 Rdn. 118)

However, article 2 TT-BER states that, pursuant to article 101(3) TFEU, article 101(1) TFEU is not applicable if the agreement in question concerns technology transfer.

In principle, the subject matter of a patent application instead of a patent can also be licensed. However, the subject matter of a patent application can be used by anyone according to §33(1) PatG. No compensation for damages has to be paid, but only a lower plain compensation.(Schäfers, 2015c) As a rule, a licence is therefore not requested on the basis of a patent application, but rather because the licensee expects the patent application to become a patent or because the proprietor of the patent application can branch off an utility model due to §5 GebrMG, which comprises a right to prohibit.(Goebel and Engel, 2015b)

TT-BER only applies if certain market share thresholds are not exceeded. The block exemption regulation distinguishes between competing and non-competing companies. For competing companies, a market share threshold of 20% due to article 3(1) TT-BER applies and for non-competing companies, a market share threshold of 30% due to article 3(2) TT-BER applies from which exemption under the TT-BER is no longer possible.(Ullmann and Deichfuß, 2015 Rdn. 271)

According to article 4(1) TT-BER, there are further strict restrictions which lead to the effect that a licence agreement is no longer covered by the exemption of TT-BER. These strict restrictions include fixed prices (lit. a), restrictions on the licensee in production or sales (lit. b), the allocation of markets or customers (lit. c), but concerning this item the article contains numerous exceptions, and the restriction of the licensee in research and development (lit. d).(Ullmann and Deichfuß, 2015 Rdn. 274)

Further, article 5(1) lit. a TT-BER prohibit an obligation to transfer or exclusively license a further development of the licensed object to the licensor.(Ullmann and Deichfuß, 2015 Rdn. 276)

R&D-BER

The R&D-BER deals with agreements on joint R&D efforts between two or more companies. Joint development or research can be beneficial for the companies involved, as the bundling of innovation capabilities can lead to faster and better results.(Smielick, 2017) Therefore, the article 2 R&D-BER determines, pursuant

to article 101(3) TFEU, article 101(1) TFEU is not applicable if the agreement in question concerns research and development.

The exploitation or use of knowledge is not a problem under antitrust law. Rather, it is a problem if the use of the knowledge is not made possible because of an agreement. The use of knowledge may not be restricted for the participants of a R&D cooperation, even if prohibition rights are derived from patents.(Schroeder, 2017; Smielick, 2017)

The R&D-BER has also to be applied on the joint exploitation of resulting technologies, which are the subject of an agreement of the parties, whereby joint R&D means that a joint team, joint organization or joint enterprise is responsible for the R&D or the exploitation of its results.(Besen and Slobodenjuk, 2011, pp. 300–301; Fuchs, 2012, Rdn. 2-9) Therefore, the R&D-BER can be relevant to an innovation method due to firm-to-firm OI.

Even if the relevant market share thresholds are exceeded, a joint R&D project may still be permitted under antitrust law by means of an individual exemption pursuant to article 101(3) TFEU and §2 GWB.(Nordemann, 2016 Rdn. 3-4; Weiß, 2016a Rdn. 156; Paal, 2018 Rdn. 1)

9.3.4 SEPs

It is controversial whether patents lead to effective economic monopolies. Due to the requirement of inventive step, typically only those inventions can be protected by a patent which are characterized by unusual forms.(Neuburger, 2005, p. 15) It is easy to find substitutes to such special forms of an invention. If there are substitutes, there is no monopoly.(Stavenhagen, 1969, p. 341; Peifer, 2001, pp. 350–351, 359–365; Pretnar, 2004, p. 779; Hades and Uhly, 2007, p. 208) It behaves differently if a patent monopolizes an industry-essential standard or norm, abbreviated SEP as standard essential patent.(Boldrin, Levine and Nuvolari, 2005; Neef, 2008, p. 83; Timmann, 2008, p. 143; Münch, 2010, p. 152; Blind and Pohlmann, 2014; Picht, 2014; Weisse, 2014, p. 8; Hauck, 2015)

Patents and standards or normations can have a contradictory intention. A patent is an exclusive right. A patent can prevent competitors from applying the protected invention. In contrast to this, setting standards is a request to use the contents of standards concerned. A technical standardization is the unification of a technical solution for general application. It is the core idea of standardization that market participants act in accordance with these standards.

Therefore, there is no workaround for the technical teaching of a SEP possible. If a market participant wishes to continue to participate in the market, he must use the patent-protected technology. Therefore, market dominance can be assumed if the company concerned owns a SEP. In this case the firm must grant a licence to a licence seeker under FRAND (fair, reasonable and non-discriminatory) conditions in order not to violate antitrust law, in particular article 101(1) TFEU. The non-granting of a license for the technology of a SEP can be used to derive an objection of compulsory licensing under antitrust law.(Ullrich, 2007; Buntscheck, 2015; Fuchs, 2015; Conrad, 2016 Rdn. 319-321; Eckel, 2017; Sonntag and Kalbfus, 2018)

However, it can also be noted that efforts to achieve norms always go hand in hand with the filing of patents. At least in practice, there is therefore no contradiction between the creation of standards and norms and the protection of the contents of these norms by patents.(Ullrich, 2007, pp. 817–818)

Therefore, if the innovation process of OI results in a third party patent whose scope of protection includes the innovation of OI and if this patent is a SEP, the use of the innovation cannot be prevented by the SEP. If an invention that is protected by an SEP flows into the own innovation, the use of the innovation cannot be prohibited either. However, these exceptions to the validity of the prohibition rights only apply in the case of an SEP. These are therefore special exceptional cases which will not be dealt with in this thesis.

9.3.5 Result

The current state of application of antitrust law is therefore that the effect of patents per se is not affected by antitrust law. Only if effects of the patent can be determined that go beyond the prohibition rights of patent law, for example through licensing, antitrust law is applicable. For this reason, the relationship between patent law and OI can be examined without consideration of antitrust law.

Under patent law, a R&D project gives rise to prohibition rights which may give one or more companies a dominant position in the market that can be viewed as abuse. Therefore, a jointly developed know-how can trigger such a situation. In particular, a R&D project involving several companies may be critical under antitrust law. Firm-to-firm OIs and firm-to-firm OIs with-an-external-inventor may therefore be less attractive for companies due to antitrust law, as companies are not free to dispose the results of development activities.

9.4 COMPULSORY LICENSES UNDER PATENT LAW

Besides the compulsory licenses under antitrust law, there are also compulsory licenses under patent law.(Weisser, 2017) The compulsory licences due to patent law are described in §24(1) PatG.(Rinken, 2017e) The compulsory licenses under patent law have so far led a shadowy existence.(Rinken, 2017e Rdn. 5) However, compulsory licenses under patent law are increasingly being used as an economic corrective.(Tandon, 1982, p. 470; Böttger, 2008) In addition, the Federal Government can issue a "right to use in the public interest" according to §13 PatG.(Rinken, 2017c)

9.5 EXPERIMENTAL PRIVILEGE

The patent rewards an inventor for expanding the technological knowledge. However, a patent gives the inventor the right to prevent the use of the invention. But, the state concerned would like to make the further development of technology possible. For this reason, experimentation with the invention is allowed in spite of the prohibition rights due to the experimental privilege of the §11 No. 2 PatG.(BGH, 1996, 1997; BVerfG, 2001; Hufnagel, 2010 Rdn. 138; Pitz, 2010 Rdn. 66)

However, experiments which do not serve to gain knowledge and which, for example, are only suitable to achieve competitive goals, are not covered by the experimental privilege. But, it is permitted to take actions during the patent term to bring a product onto the market which conforms to the subject matter of the patent immediately after expiry of the patent. Therefore, the experimental privilege of §11 No. 2 PatG applies to all types of research and development. It is not limited to scientific experiments.(BGH, 1996, 1997; BVerfG, 2001; Holzapfel, 2006; Pitz, 2010 Rdn. 66; Osterrieth, 2015a Rdn. 626-631)

But, the subject matter of the patent may not be used as a pure aid to carry out an experiment. Therefore, if the subject matter of the patent is a means for research and development, the use of this means is not covered by the experimental privilege of §11 No. 2 PatG.(Hufnagel, 2006, 2010 Rdn. 139)

In summary, it can be said that, as a rule, an innovation process cannot be hindered by the prohibition rights of the patent law. An influence of the prohibition rights on the innovation process itself therefore does not have to be examined in this thesis.

9.6 CLOSED INNOVATION

The figure 23 is used to evaluate the legal situation regarding prohibition rights of patent law.(Luginbühl, 2016; Rincken, 2017f)

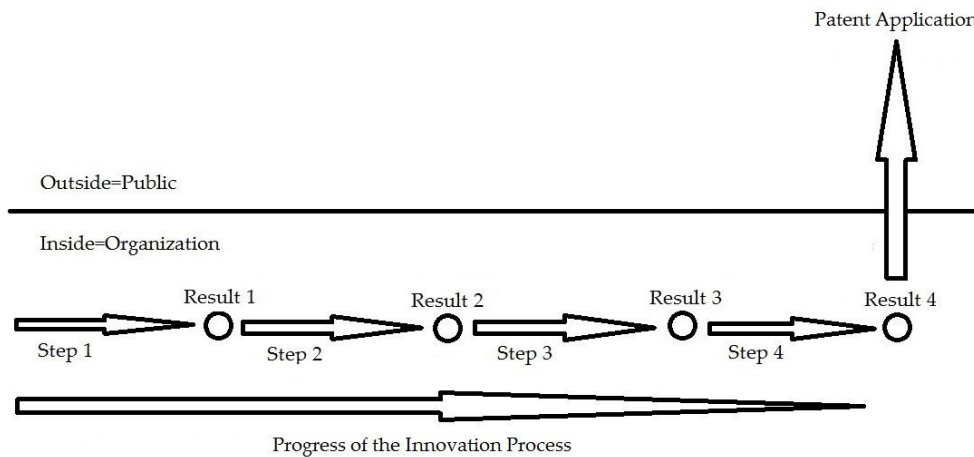


Figure 23: Closed Innovation

The figure 23 shows that no inventions that are already protected by a third party patent can be taken from the outside.(Rincken, 2017f, 2017a) The innovation method CI therefore does not increase the risk of infringing third party patents (risk of first kind of infringement).

In addition, there is no possibility for the public to obtain knowledge of the own invention. It is therefore not possible for an external person to file a patent application based on the invention of the organization with the patent office (risk of second kind of infringement).

The following table summarizes the results.

Table 13: Evaluation of CI

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	no step outside	no
Risk of second kind of Infringement	no Problem	no step outside	no

9.7 VARIANT 1 OF OI

There are three different variants of OI. There is OI as variant 1 with one organization and at least one external inventor. Another variant comprises two

or more organizations and internal inventors and the third variant has two or more organizations and at least one external inventor. These three variants of OI are examined in terms of how they can be categorized with respect to the prohibition rights of the patent law. Based on figures the impact of prohibition rights of patent law on innovations created by these variants of OI will be examined.(Luginbühl, 2016; Rincken, 2017f)

In all following cases, it is assumed that an outside-in flow does not result in the complete innovation of the own innovation process, but at most to a part of it. Further, an inside-out flow does not result in a third party invention, but at most to a part of it. If it is nevertheless the case, i.e. the absorbed or the left invention corresponds to the own innovation, the following statements can be applied analogical.

There will be again transitions from the organization to the outside area and vice versa. These transitions can be regarded as not relevant with respect to the above considerations, because the transition ways can be seen as shielded information channels.(EPO, 2012b; Moufang, 2017b, Rdn. 15-22)

The OI as variant 1 has the properties, that there is only one organization, which uses at least one external inventor for creating an innovation.

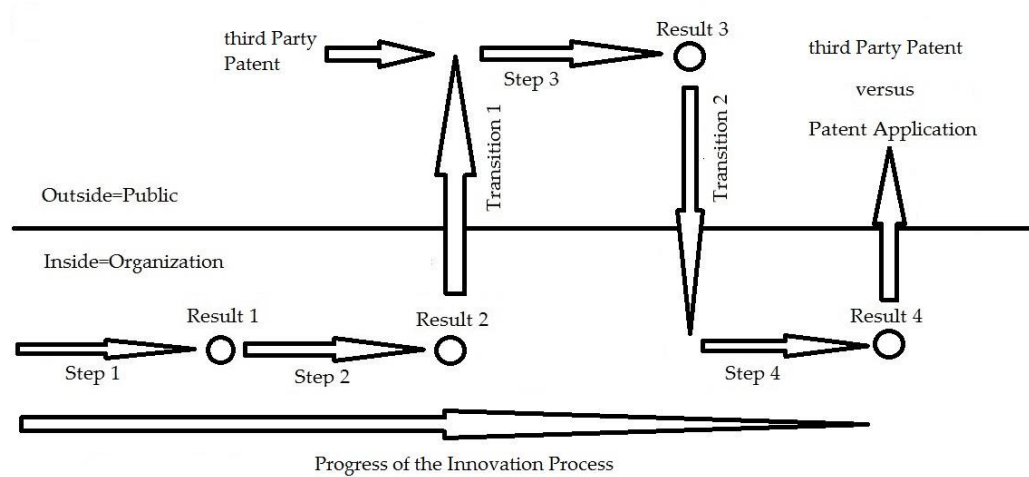


Figure 24: Problem because of prohibition rights first variant

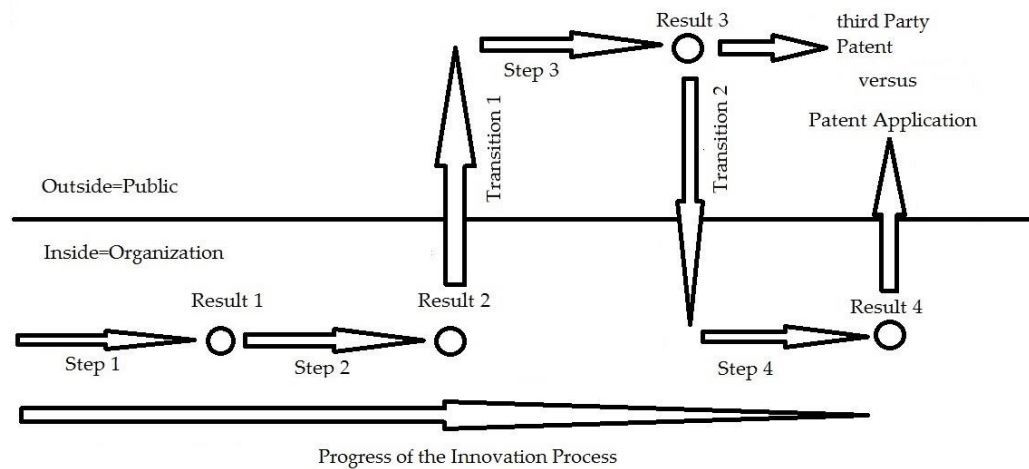


Figure 25: Problem because of prohibition rights second variant

The figures 24 and 25 show two possibilities of influencing an own innovation by the prohibition rights. In the first case, an invention of a third party patent flows into the own innovation process and results in the step 3. Therefore, the third party invention and the own innovation can have similarities. As a result, it is possible that the own innovation infringes the third party patent. (Luginbühl, 2016; Rinken, 2017f) This situation is called in this thesis “risk of first kind of infringement”.

In the second case, the own idea initiates a third party patent. Because of similarities of the own innovation with the third party patent, it is possible, that the use of the own innovation infringes the third party patent. (Kraßer and Ann, 2016, §31 Rdn 1-20) This situation is called in this thesis “risk of second kind of infringement”. These two variants of infringements because of prohibition rights are analyzed.

There can be four different assumptions, depending on the external step 3 and the internal steps 1, 2 and 4. These different assumptions are assessed according to the prohibition rights.

In a first situation, step 3 represents the only inventive part of the resulting innovation of the OI project (assumption 1). Alternatively, step 3 is inventive and one or more of steps 1, 2 or 4 are also inventive (assumption 2). In another possible situation, step 3 is not inventive, but at least one of steps 1, 2 or 4 (assumption 3). A fourth possible variant is the situation that none of the steps 1, 2, 3 and 4 of the innovation process is inventive (assumption 4). Inventive means inventive in the sense of patent law, i.e. the result of the step concerned

does not belong to the prior art and is not obvious with regard to the state of the art. An inventive contribution is therefore new and based on an inventive activity within the meaning of patent law from the moment it is created.

Assumption 1

Only step 3 is an inventive contribution. Only step 3 leads to the patentability of the corresponding invention of the innovation process. (Kroher, 2016; Moufang, 2017g)

Risk of first kind of infringement

The figure 24 shows that an invention from the outside is included as step 3 in the own innovation process. This invention results in the result 3 of step 3, wherein this result 3 is the decisive inventive part of the own innovation. Therefore, the own innovation infringes the third party patent, which comprises the invention from the outside. The own innovation is a direct infringement of the third party patent due to §9 PatG. (Keukenschrijver, 2016o; Rincken, 2017f)

Risk of second kind of infringement

The figure 25 illustrates the situation of an external inventor of result 3 who is not directly involved in the organization's development team. Instead, the external inventor may be involved in other networks that may include development teams for other projects. It may also be the case that the external inventor interacts with people working on similar projects to the organization's OI project. Therefore, the result 3 of step 3 can become known in a way that a third party patent arises from it. Steps 1, 2 and 4 are included in the organization and therefore cannot lead to a third party patent. On contrary, the decisive inventive result 3 of step 3 can lead to a third party patent that can prohibit the use of the own innovation. (Kraßer and Ann, 2016, §19 Rdn. 17-19) Therefore, this third party patent can lead to patent infringement of the own innovation. (Luginbühl, 2016; Rincken, 2017f) In this case, the own innovation is a direct infringement of the third party patent due to §9 PatG. (Keukenschrijver, 2016o; Rincken, 2017f)

Table 14: Evaluation of assumption 1 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	Problem	yes
Risk of second kind of Infringement	no Problem	Problem	yes

Assumption 2

At least one of steps 1, 2, 4 is inventive as well as step 3. There are therefore at least two steps in the innovation process, each of which leads to an inventive contribution to the resulting innovation of the innovation process.(Kroher, 2016; Moufang, 2017g)

Risk of first kind of infringement

Step 3 comprises an inventive step. It is possible that an direct infringement occurs due to §9 PatG.(Keukenschrijver, 2016o; Rincken, 2017f). Further, one's own innovation could lead to a dependent patent, the use of which can be prevented by the third party patent.(Rincken, 2017d Rdn. 103, 2017f Rdn. 8) Therefore, a third party patent may result which prevents the use of one's own innovation.

Risk of second kind of infringement

The inventive step 3 can already be protected by a third party patent when the own patent application is finished and filed with the patent office. The use of the own innovation of the OI project can therefore constitute a direct patent infringement.(Keukenschrijver, 2016o; Rincken, 2017f) Further, one's own innovation could lead to a dependent patent, the use of which can be prevented by the patent of the third party.(Rincken, 2017d Rdn. 103, 2017f Rdn. 8)

Table 15: Evaluation of assumption 2 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	Problem	yes
Risk of second kind of Infringement	no Problem	Problem	yes

Assumption 3

At least one step 1, 2, 4 is inventive and step 3 is not. In this case, the essential steps of the innovation process are those that take place within the organization. External step 3 is not significant, since it does not make an inventive contribution to the resulting innovation of the innovation process.

Risk of first kind of infringement

Step 3 is not patentable. The result 3 of step 3 forms part of the state of the art. The state of the art is public domain. State-of-the-art technology can be used by anyone without restrictions. State-of-the-art-technology cannot justify any inventive activity. Therefore, no relevant similarity can be derived from the result 3 of step 3 that could lead to the own innovation being patent infringing a third party patent, which incorporates the result 3 of step 3.(Kraßer and Ann, 2016, §16 Rdn. 1-7)

Risk of second kind of infringement

Step 3 is not patentable. Therefore, there can be no patent infringement due to a leak, which leads to a patent, that comprises the result 3 of step 3.(Kraßer and Ann, 2016, §16 Rdn. 1-7)

Table 16: Evaluation of assumption 3 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	no Problem	no
Risk of second kind of Infringement	no Problem	no Problem	no

Assumption 4

No step is inventive. Neither the external step 3 nor one or more of the internal steps of the innovation process constitute an inventive activity.(Kroher, 2016; Moufang, 2017g)

Risk of first kind of infringement

Prior art can be used freely by everyone. A patent infringement because of the result 3 of step 3 is therefore excluded.(Moufang, 2017g)

Risk of second kind of infringement

There can be no patent infringement as step 3 is not relevant from the standpoint of patent law.(Voß, 2017)

Table 17: Evaluation of assumption 4 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	no Problem	no
Risk of second kind of Infringement	no Problem	no Problem	no

Summary

The value table for variant 1 is the sum of the value tables of the four assumptions 1 to 4. In each case, the value that is most unfavourable from the point of view of patent law must be taken into account.

Table 18: Evaluation of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	Problem	yes
Risk of second kind of Infringement	no Problem	Problem	yes

9.8 VARIANT 2 OF OI

The variant 2 is characterized by the properties of two or more organizations, wherein the inventors belong to the organizations involved. Therefore, there is no external inventor. This variant can be called as firm-to-firm OI (Hagedoorn and Zobel, 2015, p. 1050), wherein the participating organizations may also be universities or other kinds of organizations instead of firms.

For variant 2 it is assumed that step 3 of the innovation process, which takes place in the second organization, is embedded within this further organization and is therefore not accessible to the public. (Keukenschrijver, 2016g Rdn. 23-24)

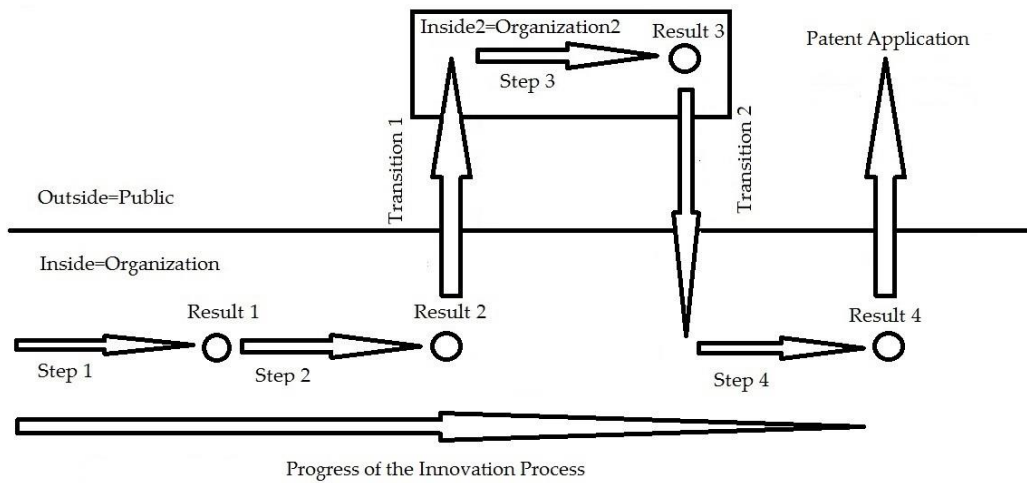


Figure 26: Variant 2 of OI

Due to the shielded nature of the second organization, it is therefore impossible for a third party invention to be included in one's own innovation process. It is also impossible for the result 3 of step 3 to get out and lead to a third party patent.(Moufang, 2017b Rdn. 32-63)

In the case of shielding by the second organization, there is only the possibility that an idea flows into the innovation process which comes from within the second organization or that the result of step 3 flows out of the innovation process and arrives in the second organization.

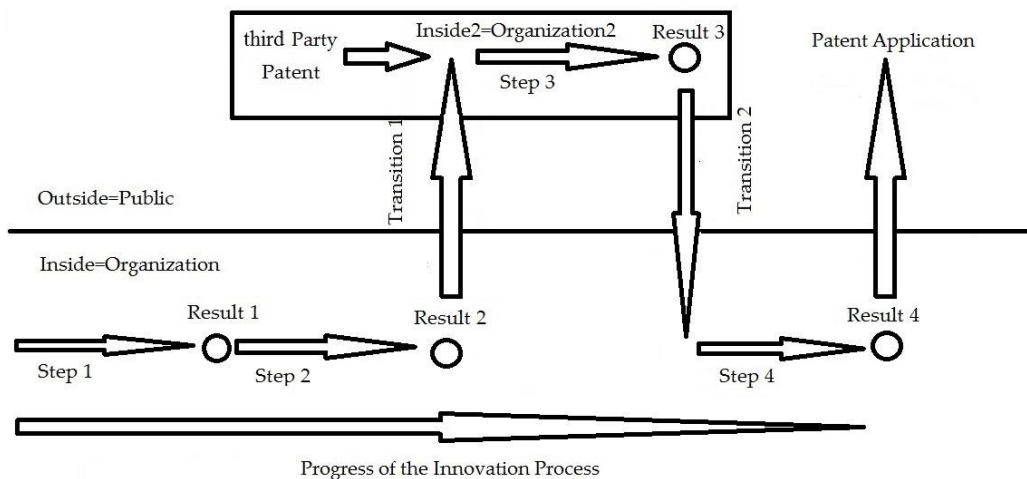


Figure 27: Problem because of prohibition rights first variant

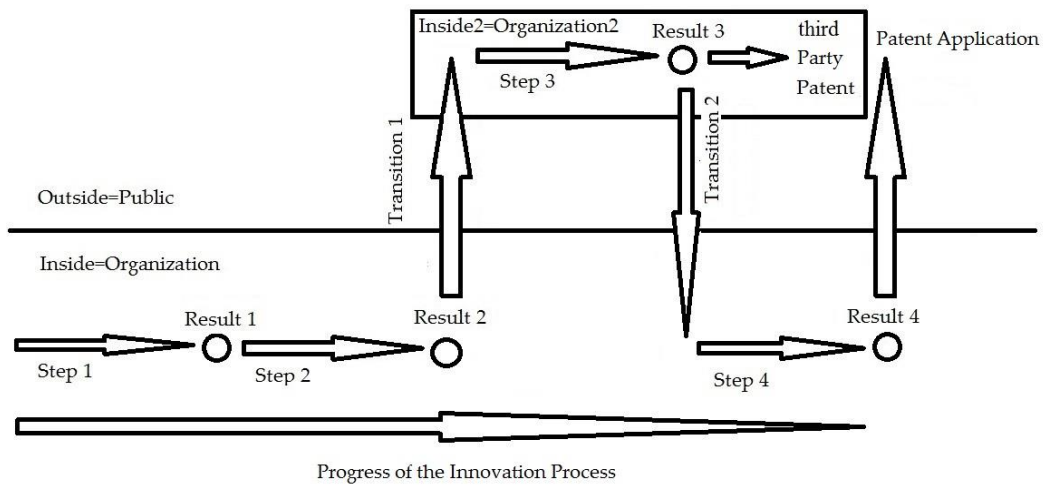


Figure 28: Problem because of prohibition rights second variant

The first and the second organizations are R&D cooperation partners within the firm-to-firm OI project and will coordinate their contributions to the innovation process. If the second organization incorporates ideas that are already protected as patents by itself or if the second organization protects ideas of the joint innovation process as patents, it can be assumed that this will be done in coordination with the first organization. It can therefore be assumed that the second organization will not enforce any prohibition rights under patent law against the first organization.

Further the R&D-BER can be relevant. In this case, the own innovation process cannot be adversely affected by the patents of the R&D collaboration partner.

Table 19: Evaluation of variant 2

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	no Problem	no
Risk of second kind of Infringement	no Problem	no Problem	no

9.9 VARIANT 3 OF OI

Variant 3 represents the negation of both features of CI. OI as variant 3 is therefore fulfilled if two or more organizations are involved in the innovation process and if at least one external inventor has been employed to generate the innovation, wherein the external inventor is of no organization an employee.

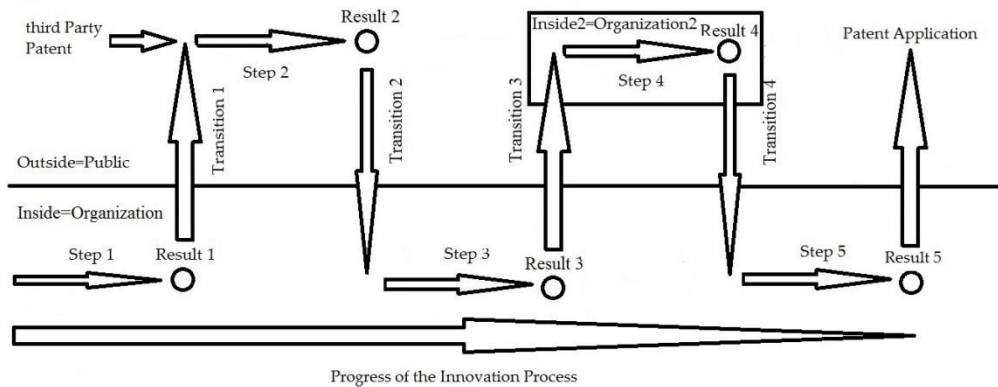


Figure 29: Problem because of prohibition rights first variant

Figure 29 shows the variant of a patent infringement in which a third party invention that is protected by a patent is incorporated into the own innovation process. The third party patent is then infringed by the use of one's own innovation.

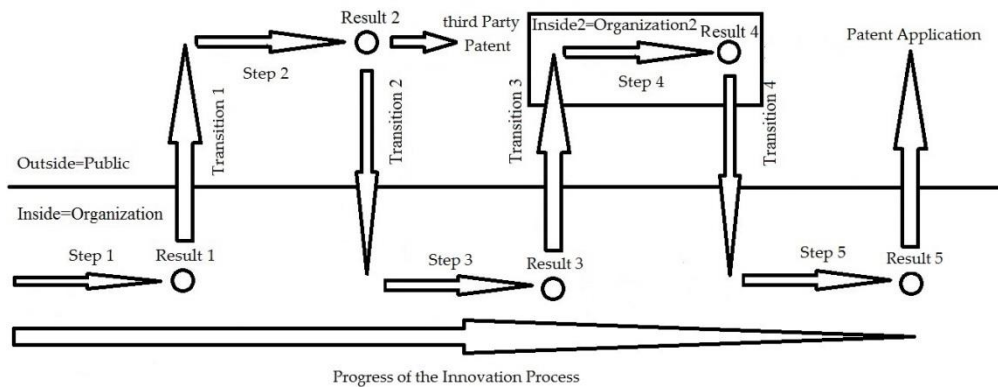


Figure 30: Problem because of prohibition rights second variant

Figure 30 shows a leakage which can result from step 2. This makes the result 2 of step 2 known and may possibly give way to a third party intellectual property right such as a patent. This third party patent can be infringed by the own innovation.(Moufang, 2017b Rdn. 32-63)

The effects of patent law on variant 3 can be determined from figures 29 and 30. Variant 3 is a sequence of two innovation methods, whereby variant 1 and variant 2 are included. The value tables of variant 1 and variant 2 are therefore summarized.

Table 20: Evaluation of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	Problem	yes
Risk of second kind of Infringement	no Problem	Problem	yes

Table 21: Evaluation of variant 2

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	no Problem	no
Risk of second kind of Infringement	no Problem	no Problem	no

The results of the tables 20 and 21 of variants 1 and 2 are combined in a single table 22. The worst results are those that prevail. This means that if a position in one table is marked "no Problem" and in the other table the same position is designated as a "Problem", the "Problem" label must finally be set for this position in the merged table. Only, if there is a "no Problem" in both tables, a "no Problem" is set at the corresponding position in the resulting table. The worst-case scenario is therefore always assumed, since the concrete situation is not known. The resulting table 22 is as follows:

Table 22: Evaluation of variant 3

	Steps inside	Step outside	Problems
Risk of first kind of Infringement	no Problem	Problem	yes
Risk of second kind of Infringement	no Problem	Problem	yes

9.10 ANSWER TO THE EIGHTH RESEARCH QUESTION

Firm-to-firm OI, OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor processes have more links to the outside world of an organization than a CI innovation process. Firm-to-firm OI has links between the organizations involved in the innovation process. These links between the organizations are shielded. Therefore, it can be assumed, that a diffusion of knowledge from inside the organizations involved to outside or vice versa cannot happen. In this sense, firm-to-firm OI and CI can be regarded as similar from a patent law standpoint.

The external steps of the innovation methods according to OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor are not shielded. Therefore, a diffusion of information from outside to inside and vice versa is possible. This open nature of OI with-an-external-inventor and firm-to-firm OI

with-an-external-inventor can lead to legal difficulties regarding the prohibition rights of patent law.(Keukenschrijver, 2016d; Voß, 2017)

Comparison with the evaluation tables shows that from the viewpoint of the prohibition rights of patent law CI and variant 2 of OI form a first group and variants 1 and 3 of OI are to be assigned to a second group.

The same grouping of innovation methods as mentioned above can be used. From the standpoint of the prohibition rights of patent law firm-to-firm OI and CI are similar and form a first group of innovation methods, whereas OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor form a second group.

10 OI AND UNLAWFUL REMOVAL

The evaluation of the innovation methods resulted in the same grouping in the foregoing chapters 8 and 9. Now, it is to be checked whether this grouping also makes sense with respect to the legal instrument of unlawful removal according to patent law.

An unlawful removal is examined in two cases. Firstly, a third party invention can be taken in from the outside, which flows into the own innovation process. This case can result in an unlawful removal if the own invention is filed with the patent office. In this case one has violated the patent law and can be sued.(Moufang, 2017n)

Secondly, the own innovation can be subject of an unlawful removal. In this case, a third party has violated the own rights and this third party can be prosecuted.(Melullis, 2015c Rdn. 6-10)

10.1 NINTH RESEARCH QUESTION

The various innovation methods are examined to determine which groups result from the viewpoint of unlawful removal of the patent law.

Ninth research question

Which are the groups of innovation methods from the standpoint of the legal instrument of unlawful removal of patent law?

10.2 UNLAWFUL REMOVAL

If a patent application is filed for an invention by a non-entitled applicant, an unlawful withdrawal within the meaning of patent law due to §8 PatG and article 61 EPC is constituted.(Keukenschrijver, 2016n; Moufang, 2017n)

There is no difference whether the own innovation is identical to the removed invention or whether the unlawfully removed invention is only a part of the invention filed.(Moufang, 2017n Rdn. 19-20)

10.3 CLOSED INNOVATION

The figure 31 is used to evaluate the legal situation for CI regarding unlawful removal.(Bremi and Stauder, 2016b; Moufang, 2017n)

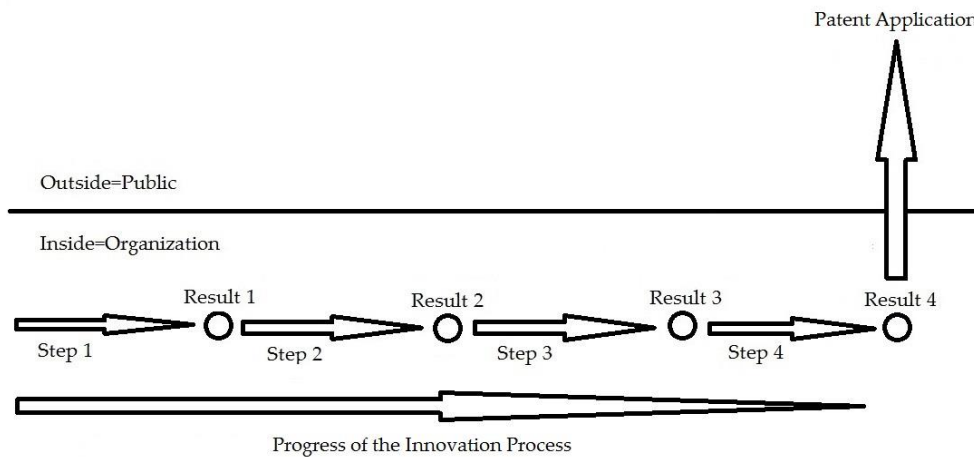


Figure 31: Closed Innovation

The figure 31 shows that there is no possibility for an inflow of a third party invention (first kind of unlawful removal). Further, it is also not possible that a part of the own innovation leaves the own innovation process (second kind of unlawful removal). An unlawful removal is excluded.(Moufang, 2017n) The innovation method CI therefore does not increase the risk of unlawful removal.

The following table summarizes the results.

Table 23: Evaluation of CI

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	no Step outside	no
Risk of second kind of unlawful Removal	no Problem	no Step outside	no

10.4 VARIANT 1 OF OI

Based on figures of the variants of OI, the impact of the legal instrument of unlawful removal will be examined.(Bremi and Stauder, 2016b; Moufang, 2017n)

There will be transitions from the organization to the outside world and vice versa. These transitions can be regarded as not relevant with respect to the

above considerations, because the transition ways can be seen as shielded information channels.(EPO, 2012b; Moufang, 2017b, Rdn. 15-22)

The OI as variant 1 has the properties, that there is only one organization, which uses at least one external inventor for creating an innovation.

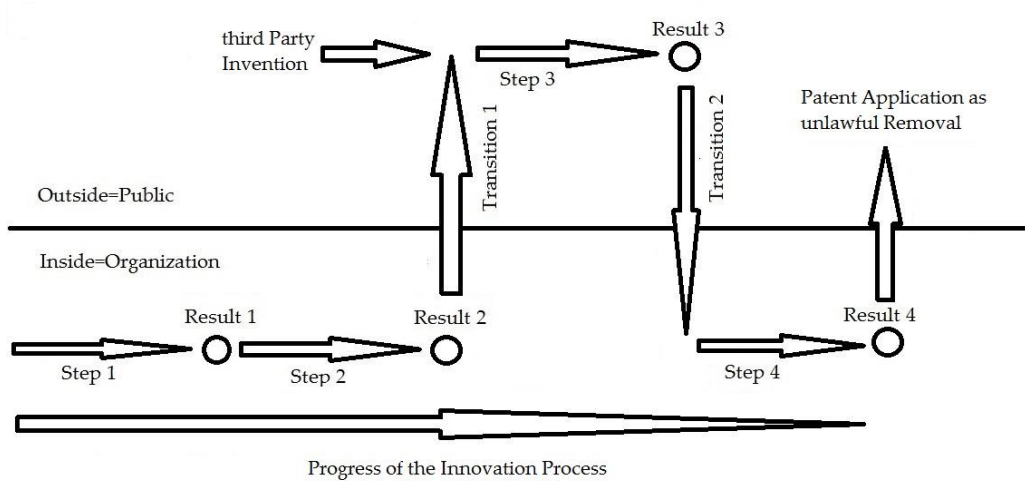


Figure 32: Problem because of unlawful removal first variant

The figure 32 is to be understood in such a way that the third party invention leads to result 3 of step 3. The result 3 of step 3 of the innovation process therefore corresponds to the third party invention.

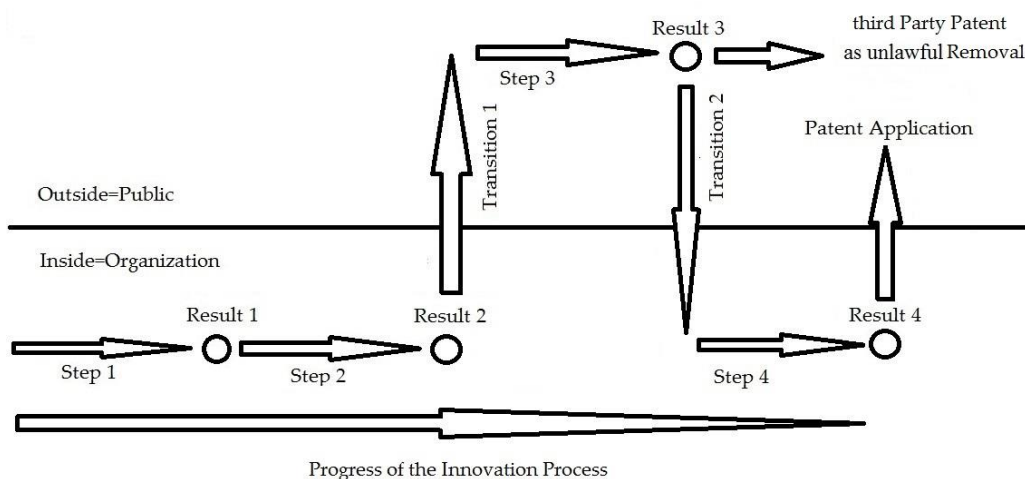


Figure 33: Problem because of unlawful removal second variant

The figure 33 is to be understood in such a way that the complete result 3 of step 3 flows outwards as an unlawful withdrawal. The results of the other steps 1, 2 and 4 are not comprised by the unlawful removal.

Figures 32 and 33 show the two possibilities that can lead to an unlawful withdrawal. In the first figure 32 an invention comes from the outside, which is incorporated into one's own innovation process. In this case, the own organization may be not entitled within the meaning of patent law. In figure 33 the own organization is the one infringed by an unlawful removal, since the result 3 is filed with the patent office by a non-entitled party.(Breimi and Stauder, 2016b; Moufang, 2017n) These two variants of problems because of unlawful removal are analyzed.

There can be four different assumptions, depending on the external step 3 and the internal steps 1, 2 and 4. These different assumptions are assessed according to the legal instrument of unlawful removal.

In a first situation, step 3 represents the only inventive part of the resulting innovation of the OI project (assumption 1). Alternatively, step 3 is inventive and one or more of steps 1, 2 or 4 are also inventive (assumption 2). In another possible situation, step 3 is not inventive, but at least one of steps 1, 2 or 4 (assumption 3). A fourth possible variant is the situation that none of the steps 1, 2, 3 and 4 of the innovation process is inventive (assumption 4). Inventive means inventive in the sense of patent law, i.e. the result of the step concerned does not belong to the prior art and is not obvious with regard to the state of the art. An inventive contribution is therefore new and based on an inventive activity within the meaning of patent law from the moment it is created.

Assumption 1

Only Step 3 is an inventive contribution. Only step 3 leads to the patentability of the corresponding innovation of the innovation process. The result 3 of step 3 is new and inventive in its creation.

Risk of first kind of unlawful removal

By including an inventive contribution in one's own innovation and the fact that the contributions of the remaining steps 1, 2 and 4 of the innovation process do not constitute an inventive contribution, the third party invention is essentially identical to one's own innovation. This results in an unlawful withdrawal if the own innovation is filed with the patent office.(Moufang, 2017n Rdn. 19-20)

Risk of second kind of unlawful removal

The only inventive step 3 is unlawful removed by a third party. It is possible to sue the third party for unlawful removal.

Table 24: Evaluation of assumption 1 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	Problem	yes
Risk of second kind of unlawful Removal	no Problem	Problem	yes

Assumption 2

At least one of steps 1, 2, 4 is inventive as well as step 3. There are therefore at least two steps in the innovation process, each of which leads to an inventive contribution to the resulting innovation of the innovation process.

Risk of first kind of unlawful removal

In this case, there is an unlawful withdrawal that entitles the third party at least to a right of co-use (BGH, 2009; Kraßer and Ann, 2016, §20 Rdn. 17) or the splitting out of the unlawfully removed part.(BGH, 1979) Therefore, the inventive step 3 constitutes an unlawful withdrawal.

Risk of second kind of unlawful removal

Leaving of an inventive part of one's own innovation to the outside can lead to an unlawful removal in which one's own organization is the infringed party within the meaning of patent law.(Kraßer and Ann, 2016, §20 Rdn. 1)

Table 25: Evaluation of assumption 2 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	Problem	yes
Risk of second kind of unlawful Removal	no Problem	Problem	yes

Assumption 3

At least one of the steps 1, 2, 4 is inventive and step 3 is not. In this case, the essential steps of the innovation process are those that take place within the organization. External step 3 is not significant, since it does not make an inventive contribution to the resulting innovation of the innovation process. Result 3 of step 3 forms part of the state of the art.

Risk of first kind of unlawful removal

The third party invention represents a part of the state of the art and may therefore be used by anyone without restrictions. There is no unlawful removal.(Moufang, 2017n Rdn. 19-20)

Risk of second kind of unlawful removal

Step 3 is not patentable. The result of step 3 forms part of the state of the art. For this reason, no unlawful withdrawal is possible.(Kraßer and Ann, 2016, §20 Rdn. 13; Moufang, 2017n Rdn. 19-20)

Table 26: Evaluation of assumption 3 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	no Problem	no
Risk of second kind of unlawful Removal	no Problem	no Problem	no

Assumption 4

No step is inventive. Neither the external step 3 nor one of the internal steps of the innovation process constitute an inventive activity.

Risk of first kind of unlawful removal

The use of a feature of the state of the art cannot lead to an unlawful removal.(Moufang, 2017n Rdn. 19-20)

Risk of second kind of unlawful removal

Step 3 is not patentable and therefore unlawful removal is excluded.(Keukenschrijver, 2016n Rdn. 15-16; Moufang, 2017n Rdn. 19-20)

Table 27: Evaluation of assumption 4 of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	no Problem	no
Risk of second kind of unlawful Removal	no Problem	no Problem	no

Summary

The value table for variant 1 of OI is the sum of the value tables of the four assumptions. In each case, the value that is most unfavourable from the point of view of patent law must be taken into account.

Table 28: Evaluation of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	Problem	yes
Risk of second kind of unlawful Removal	no Problem	Problem	yes

10.5 VARIANT 2 OF OI

The variant 2 is characterized by the properties of two or more organizations, wherein the inventors belong to the organizations involved. Therefore, there is no external inventor. This variant can be called as firm-to-firm OI.(Hagedoorn and Zobel, 2015, p. 1050)

By shielding step 3 by the company boundaries of the second organization, no third party invention can enter the innovation process from outside. Furthermore, it is impossible for the result of step 3 to reach the outside world, as the company boundaries of the second organization prevent this.

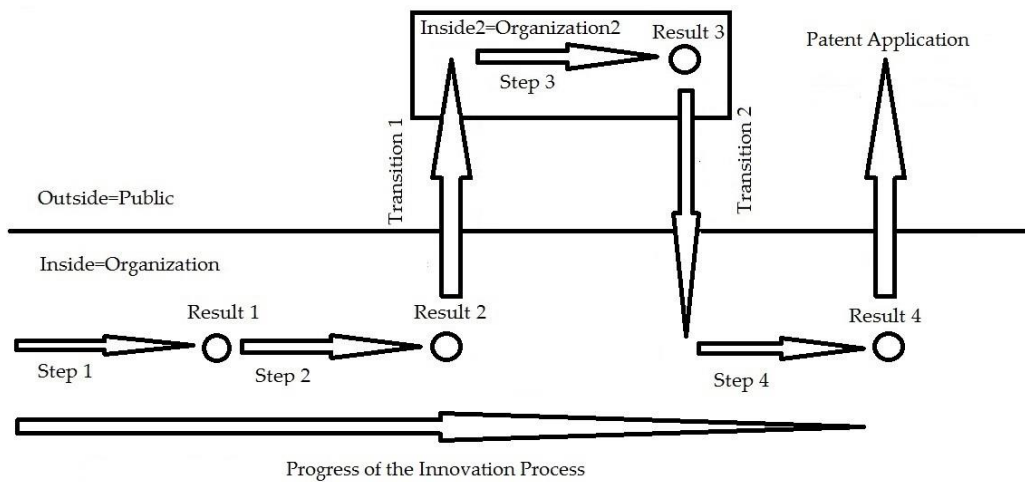


Figure 34: Variant 2 of OI

However, it is possible that an invention may flow into the innovation process which comes from the second organization (figure 35). There is also the possibility that the result 3 of step 3 will spread within the second organization (figure 36).

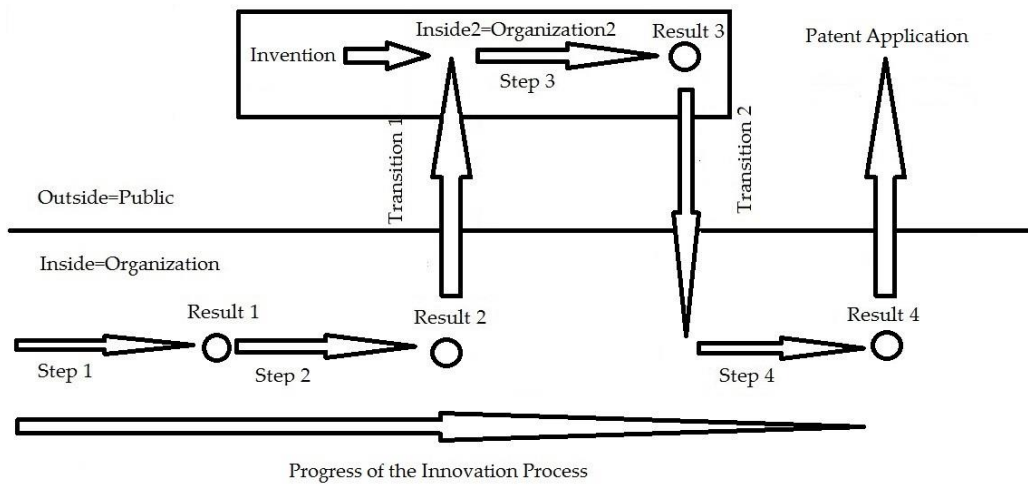


Figure 35: Problem because of unlawful removal first variant

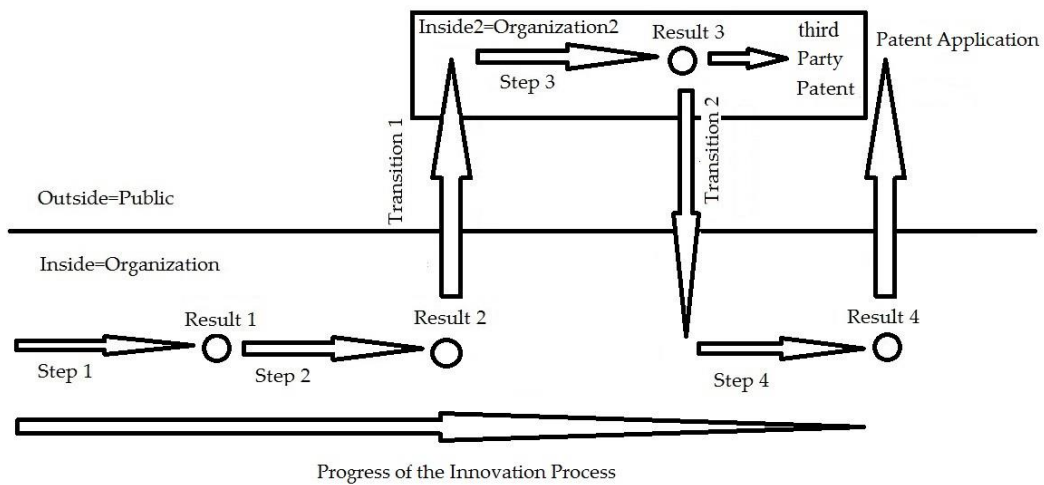


Figure 36: Problem because of unlawful removal second variant

It is assumed that the partners of a firm-to-firm OI project will coordinate their efforts for innovating. Legal problems because of an unlawful removal due to figures 35 and 36 can therefore be ruled out.

The following table summarizes the results.

Table 29: Evaluation of variant 2

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	no Problem	no
Risk of second kind of unlawful Removal	no Problem	no Problem	no

10.6 VARIANT 3 OF OI

Variant 3 represents the negation of both features of CI. OI as variant 3 is therefore fulfilled if two or more organizations are involved in the innovation process and if at least one external inventor has been employed to generate the invention, wherein the external inventor is of no organization an employee.

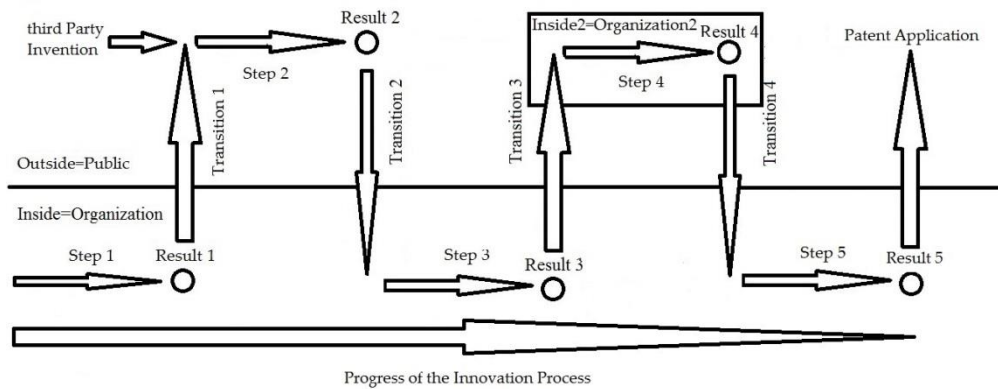


Figure 37: Problem because of unlawful removal first variant

Figure 37 shows the inflowing of a third party invention. The third party can be infringed by an unlawful removal.

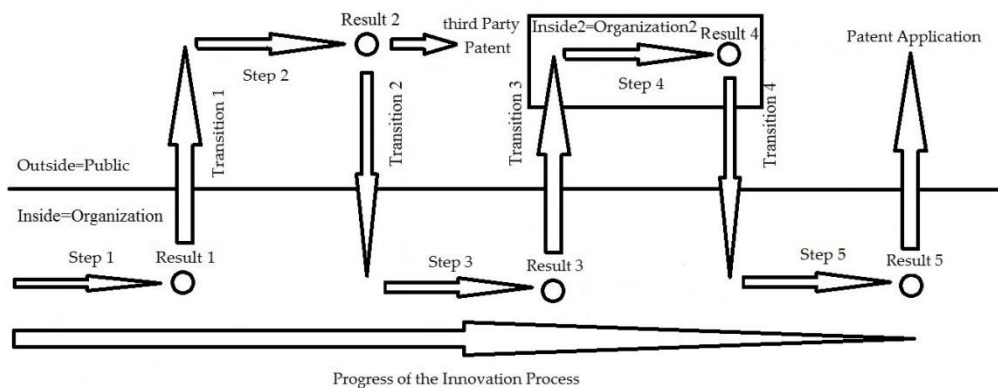


Figure 38: Problem because of unlawful removal second variant

Figure 38 shows a leakage which can result from step 2. This makes the result 2 of step 2 known and may possibly give way to an unlawful removal by a third party patent.

The effects of patent law on variant 3 of OI can be determined from figures 37 and 38. Variant 3 of OI is a sequence of two innovation methods, whereby variant 1 of OI and variant 2 of OI are included. The value tables of variant 1 of OI and variant 2 of OI are therefore summarized.

Table 30: Evaluation of variant 1

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	Problem	yes
Risk of second kind of unlawful Removal	no Problem	Problem	yes

Table 31: Evaluation of variant 2

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	no Problem	no
Risk of second kind of unlawful Removal	no Problem	no Problem	no

The results of the tables of variants 1 and 2 are combined in a single table. The worst results are those that prevail. This means that if a position in one table is marked "no Problem" and in the other table the same position is designated as a "Problem", the "Problem" label must finally be set for this position in the merged table. Only if there is a "no Problem" in both tables, a "no Problem" is set at the corresponding position in the resulting table. The worst-case scenario is therefore always assumed, since the concrete situation is not known. The resulting table 32 is as follows:

Table 32: Evaluation of variant 3

	Steps inside	Step outside	Problems
Risk of first kind of unlawful Removal	no Problem	Problem	yes
Risk of second kind of unlawful Removal	no Problem	Problem	yes

10.7 ANSWER TO THE NINTH RESEARCH QUESTION

Firm-to-firm OI, OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor innovation processes have more links to the outside world of an organization than a CI innovation process. Firm-to-firm OI has links between the organizations involved. These links of firm-to-firm OI are shielded. Therefore, it can be assumed, that a diffusion of knowledge from inside to outside or vice versa cannot happen. In this sense, firm-to-firm OI and CI can be regarded as similar.

The external steps of the innovation methods according to OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor are not shielded. Therefore, a diffusion of information from outside to inside and vice versa is possible. This open nature of OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor can lead to legal difficulties regarding the legal instrument of unlawful removal of patent law.

The comparison with the evaluation tables shows that from the viewpoint of the legal instrument of unlawful removal of patent law CI and variant 2 of OI form a first group and variants 1 and 3 of OI are to be assigned to a second group.

The same grouping of innovation methods as in the chapters 8 and 9 can be used. From the standpoint of the legal instrument of unlawful removal of patent law firm-to-firm OI and CI are similar and form a first group of innovation methods, whereas OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor form a second group.

11 EMPIRICAL STUDIES

One finding of the preceding parts of the thesis is that there are four innovation methods, namely CI, firm-to-firm OI, OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor.

An additional finding is that from the standpoint of patent law it is decisive, whether there is an external inventor or not. Therefore, these innovation methods can be grouped as follows:

- Group 1
Closed Innovation and firm-to-firm OI
- Group 2
OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor

It has been found that inventions by CI or firm-to-firm OI are not affected adversely from the standpoint of patent law, whereas inventions by OI with-an-external-inventor or firm-to-firm OI with-an-external-inventor can result in problems due to patent law.

Empirical studies are conducted to validate these theoretical results. If it turns out that there are more OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor patent applications than CI and firm-to-firm OI patent applications, this would argue against the theoretical results of the thesis. However, if more patent applications were due to the first group of innovation methods than to the second group of innovation methods, this would support the results of the thesis so far. In the latter case, the findings of the thesis will not be falsified.

11.1 TENTH RESEARCH QUESTION

The theoretical part of the thesis has shown that the innovation methods due to group 1 are in line with patent law, whereas the innovation methods of group 2 are not in line with patent law.

Secondly, two pairs of innovation methods could be identified, which represent opposites from a patent law perspective:

- CI versus OI with-an-external-inventor and
- firm-to-firm OI versus firm-to-firm OI with-an-external-inventor.

These findings can be empirically falsified if:

- there are more OI with-an-external-inventor patent applications than CI patent applications,
- there are more firm-to-firm OI with-an-external-inventor patent applications than firm-to-firm OI patent applications and
- there are more group 2 patent applications than group 1 patent applications.

Therefore, the research question arises as:

Tenth research question

Can the theoretical results be falsified by empirical studies? Particularly, how are the following questions answered by empirical studies?

- **Are there more OI with-an-external-inventor patent applications than CI patent applications or vice versa?**
- **Are there more firm-to-firm OI with-an-external-inventor patent applications than firm-to-firm OI patent applications or vice versa?**
- **Are there more group 2 patent applications than group 1 patent applications or vice versa?**

The initial tenth research question of chapter 1 is now formulated in more detail due to the findings of the thesis, which shall be checked.

11.2 STATE OF THE SCIENTIFIC RESEARCH

If an invention is created by an employee and filed by his employer, there is no external inventor. Instead, the employee belongs to the employer's company. In this case there is either a CI or a firm-to-firm OI patent application.

The scientific community assumes that currently more than 80% of patent applications are filed by employers.(Bartenbach and Volz, 2012, Einleitung Rdn. 2; Keukenschrijver, 2016p Rdn. 1; Kraßer and Ann, 2016, §21 Rdn. 1)

However, in the realm of labor a steady erosion of the previous rigid employer-employee relationships can be observed. Increasingly, variants of working have been developed, which have to be settled between dependent labor and self-

employment.(Deinert, 2014; Uffmann, 2016) For example, the number of people working for a company as a member of a crowd has grown significantly. Both, simple work and complex mental projects can be handled by a crowd.(Redaktion FD-ArbR, 2016) On the basis of these social developments it can be assumed an increase of OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor and a decline of CI and firm-to-firm OI.

Digital communication enables the increasing of the flexibility of working conditions. Therefore, the "digitization" of the working world seems to foster this development.(Bauschke, 2016) On the other hand, these new technological possibilities, such as the internet and digital communication, result in problems for patent law, which can lead to undesirable legal results.(Meitinger, 2017e) This legal uncertainty contradicts the expected increase of innovation methods with external inventors, namely OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor.

11.3 LEGAL ASPECT

Due to §6 sentence 1 PatG and article 60(1) sentence 1 EPC the origin of an invention must be an inventor.(Melullis, 2015b; Keukenschrijver, 2016l; Moufang, 2017l; Visser, 2017, pp. 129–131) There are no inventions without human origin.(Deutsches Patentamt, 1951; Meitinger, 2017d, p. 149) The applicant can be different to the inventor. But, according to §37(1) sentence 2 PatG and article 81 sentence 2 EPC the applicant has to declare how he received the property in the invention if he is not the inventor.(Moufang, 2017f)

In Germany there is the GEIA, which determines that an employer receives the property of an invention, if he wants to. According to §6 GEIA, an employer has the right to claim an employee's invention. This transfer must be declared to the patent office due to §37(1) sentence 2 PatG and article 81 sentence 2 EPC by the form for designation of the inventor due to §37(1) sentence 1 PatG and article 81 sentence 1 EPC. On the basis of this declaration, it can be determined whether the inventor is an employee.(Keukenschrijver, 2016k; Kraßer and Ann, 2016, §20 Rdn. 122; Visser, 2017, p. 174; DPMA, 2018d; EPO, 2018b) If the inventor is an employee the invention concerned is one of CI or firm-to-firm OI. The innovation methods OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor are excluded. Further, the distinction between CI and OI with-an-external-inventor versus firm-to-firm OI and firm-to-firm OI with-an-external-inventor can be found by looking up in the patent registers the applicants. If there is only one applicant, there is CI or OI with-an-external-

inventor. If there are several applicants one has a firm-to-firm OI or a firm-to-firm OI with-an-external-inventor.

A managing director is no employee in the terms of GEIA.(Keukenschrijver, 2016a Rdn. 3) But from the point of view of an innovation method, a CEO belongs to his company. Therefore, if a CEO creates an invention, he is considered as internal inventor and not as external inventor. But, in this case, the declaration of the legal transfer of the invention due to §37(1) sentence 2 PatG and due to article 81 sentence 2 EPC, which is comprised by the form for the designation of the inventor due to §37(1) sentence 1 PatG and due to article 81 sentence 1 EPC of the GPTO and the EPO, would make a misleading statement.(DPMA, 2018d; EPO, 2018b) The managing directors of each company involved in the empirical studies are therefore identified in the commercial registers in order to correct any misleading statements.

11.4 DATABASES AND PATENT REGISTERS

The GPTO's DEPATISnet.de database is used to find the relevant patent applications for the thesis.(DPMA, 2018c) DEPATISnet.de provides the possibility to search the document archive of the GPTO. This database contains over 80 million patent publications.(DPMA, 2018b)

In a second step, the patent applications identified must be inspected in order to determine which innovation method was used. But, the patent register of the GPTO does not enable online file inspection of all patent applications filed with the patent office. Only files that have led to a patent after January 21, 2013 can be viewed online. The files of the other patent applications can only partially be inspected online.(Keukenschrijver, 2016h Rdn. 84; DPMA, 2018g) It is therefore necessary to use the EPO's patent register which enables the online file inspection of all patent applications from the year 2000.(EPO, 2018c) By this way the designation of the inventor and the request for grant of a patent can be found.(EPO, 2018b, 2018a)

The declarations of the legal transfers of the inventions due to §37(1) sentence 2 PatG and due to article 81 sentence 2 EPC are comprised by the forms for the designations of the inventors due to §37(1) sentence 1 PatG and due to article 81 sentence 1 EPC of the GPTO and the EPO.(DPMA, 2018d; EPO, 2018b) Therefore, the designations of the inventors can be used to determine the legal situation of the inventors, whether the inventors are employees or not.(Moufang, 2017f)

If at least one inventor without an employment relationship can be derived from the designation of the inventor it can be assumed that at least one inventor is external. In this case, there is a patent application due to OI with-an-external-inventor or due to firm-to-firm OI with-an-external-inventor. The request for grant of a patent can be used to determine whether one or more applicants were involved in the patent application in question.(DPMA, 2018a; EPO, 2018a)

The different cases described above can be summarized as rules. These rules serve to illustrate how the data of the databases and patent registers are used.

Rule 1

If there is an external inventor, the invention was created by OI with-an-external-inventor or firm-to-firm OI with-an-external-inventor.

Rule 2

If there is no external inventor, the invention was created by CI or firm-to-firm OI.

Rule 3

If there is only one applicant, the invention was created by CI or OI with-an-external-inventor.

Rule 4

If there are two or more applicants, the invention was created by firm-to-firm OI or firm-to-firm OI with-an-external-inventor.

First, the innovation methods CI, OI with-an-external-inventor, firm-to-firm OI and firm-to-firm OI with-an-external-inventor will be described individually and how the above explained rules work. This makes it clear how the rules can be applied to distinguish the innovation methods. In a next step, critical situations are analyzed to see how the rules work in these situations.

11.5 CLOSED INNOVATION

In case of CI there are only internal inventors. According to the patent law, inventors acquire all rights to their inventions.(Moufang, 2017l) But the company is entitled to take over the invention by virtue of its position as an employer according to the GEIA.(Keukenschrijver, 2016k) The company is therefore authorized to file the invention as applicant with the patent office.

According to §37(1) sentence 2 PatG and article 81 sentence 2 EPC the applicant must declare how the right of the invention was transferred to him, if the applicant is not the inventor. (Teschemacher, 2016b Rdn. 5; Moufang, 2017f Rdn. 13; Visser, 2017, p. 174)

Figure 39 illustrates the situation of CI. The organization is the employer of the inventors. The company will state by the designation of the inventor that it has obtained the right of the invention as an employer from the inventors of steps 1, 2, 3 and 4. (Keukenschrijver, 2016k; DPMA, 2018d; EPO, 2018b) The results of the steps 1, 2, 3 and 4 can be created by one or two or three or any number of inventors.

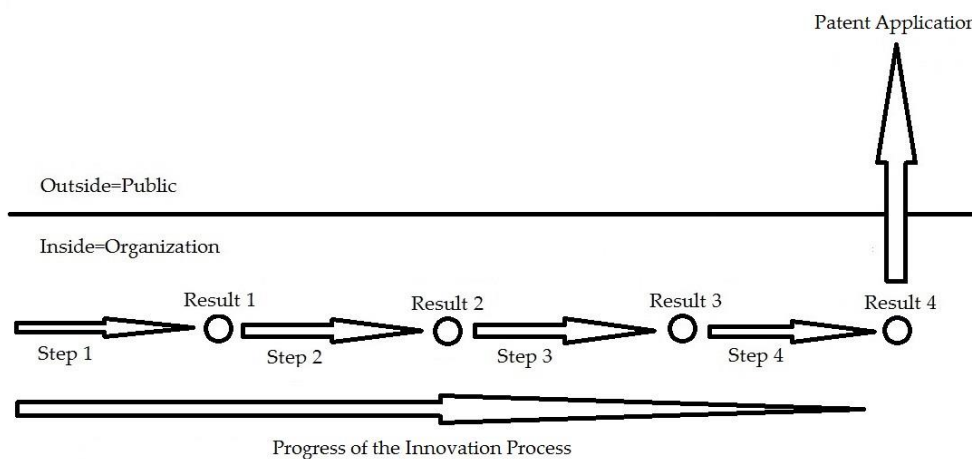


Figure 39: Closed Innovation

11.6 VARIANT 1 OF OI

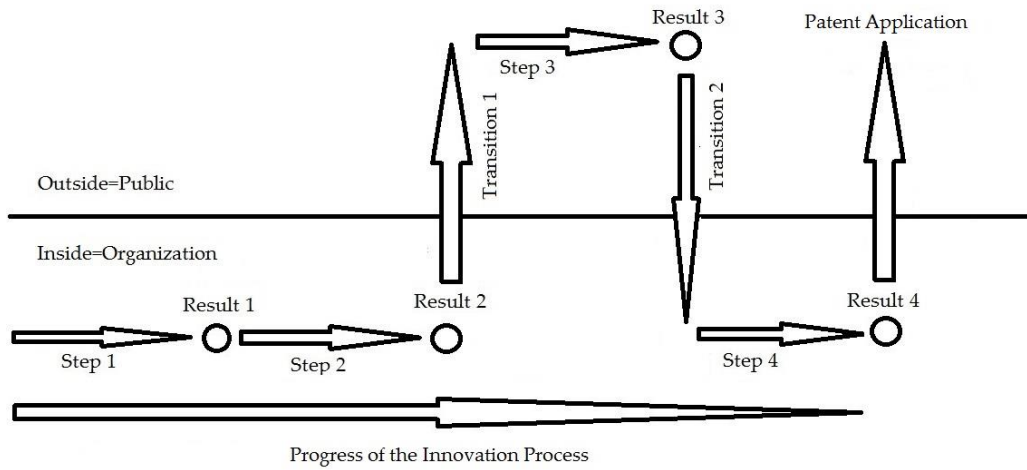


Figure 40: Variant 1 of OI

In this case, there is at least one external inventor, who developed the result 3 of the invention. Therefore, the invention in question is not developed totally within the organization. Rather, there is an external inventor who has conferred the right to the invention to the organization not as an employee, but as a free inventor. This can be seen from the designation of the inventor. (Keukenschrijver, 2016k; DPMA, 2018d; EPO, 2018b)

11.7 VARIANT 2 OF OI

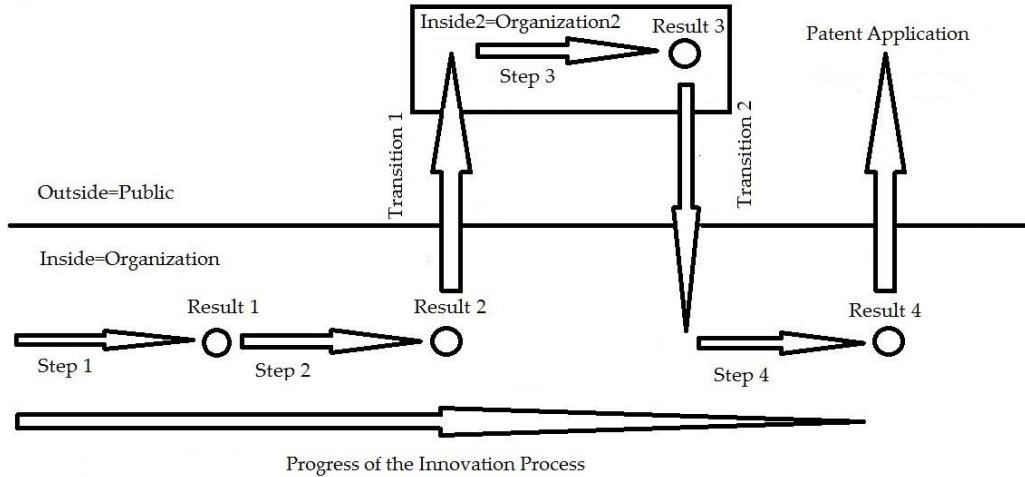


Figure 41: Variant 2 of OI

A variant 2 of OI is characterized by two or more applicants, who can be identified by the patent register with the help of the request for grant of a patent.(DPMA, 2018a; EPO, 2018a) In this case the creation of the invention was conducted by several firms. It is an additional requirement for a firm-to-firm OI, that the inventors are members of the respective organizations. This requirement can be verified by the designations of the inventors. In this case the designations of the inventors describe that the legal transfer of the invention was taken place on the basis of the GEIA.(Kraßer and Ann, 2016, §21 Rdn. 66-81; DPMA, 2018d; EPO, 2018b)

11.8 VARIANT 3 OF OI

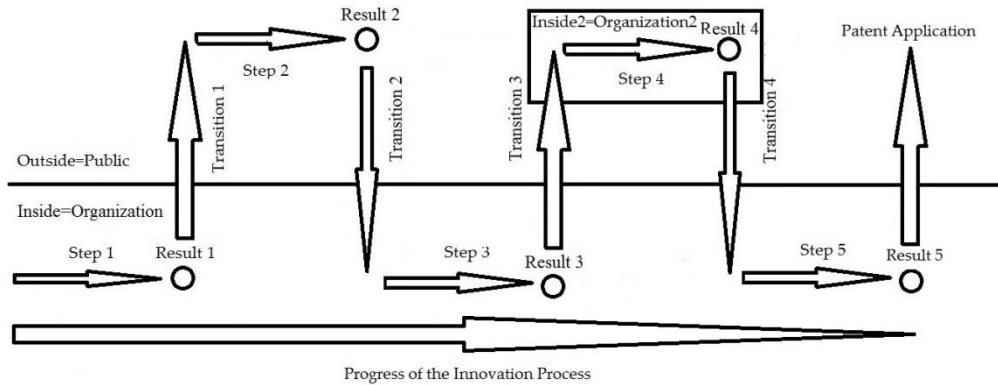


Figure 42: Variant 3 of OI

The variant 3 of OI is a sequence of variant 1 and variant 2 of OI. Therefore, it must be found the properties of a variant 1 of OI and additionally the characteristics of a variant 2 of OI. Only, if both different characteristics can be found there is a variant 3 of OI. Therefore, there must be:

- at least one external inventor due to the designation of the inventor,
- at least one internal inventor due to the designation of the inventor and
- at least two organizations due to the request for grant of a patent.

11.9 CRITICISM

Special situations are considered which may lead to a difficult or incorrect determination of the innovation method used. Conclusions are drawn from this in order to avoid incorrect determination of the innovation method applied.

Transfer of the patent application by treaty after filing

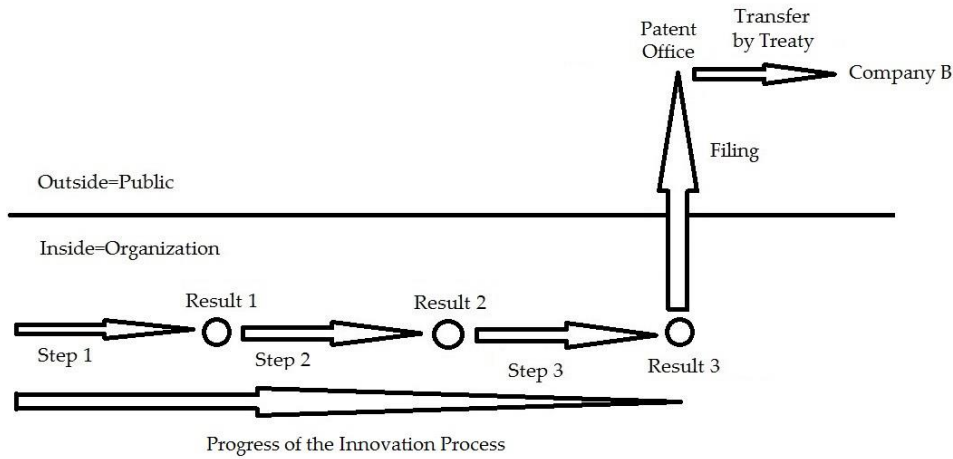


Figure 43: Transfer after filing: CI

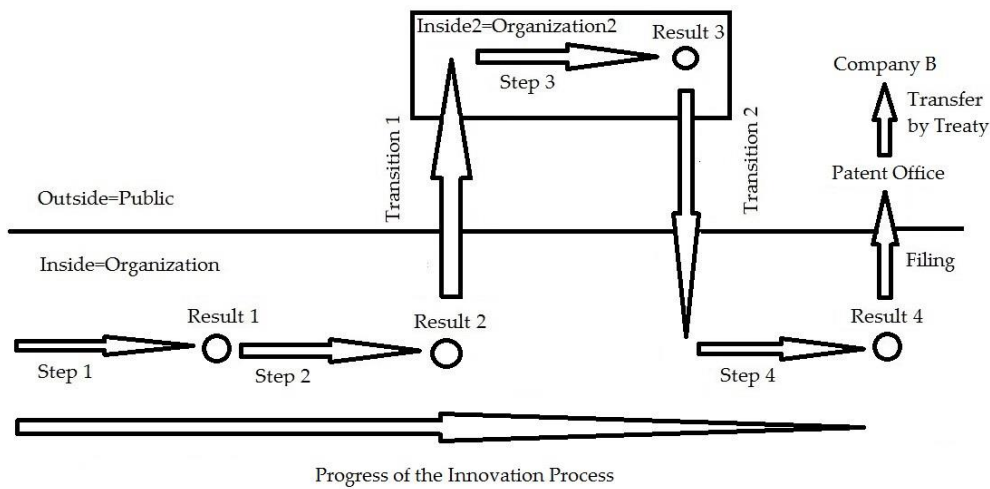


Figure 44: Transfer after filing: firm-to-firm OI

Problem

The figures 43 and 44 show a legal transfer of the patent application after filing. The current owner can be found in the patent registers.(DPMA, 2018b; EPO, 2018c) But, the current owner has nothing to do with the innovation process. It is therefore wrong to assume that there are external inventors because the inventors are no employees of the current owner. The situations illustrated in

the figures 43 and 44 are therefore not correctly evaluated if the current owner of the patent application is used to determine the innovation method applied.

The situations of transfers after filing do not lead to problems with the innovation methods OI with-an-external-inventor or firm-to-firm OI with-an-external-inventor innovation, since in these cases external inventors are actually involved in the innovation process. In these cases, the correct result is therefore obtained even if the wrong prerequisites are assumed.

Solution

In these cases the current owner of the patent application is not the organization which carried out the innovation process. Only with respect to the organization which carried out the innovation process it is possible to distinguish internal and external inventors correctly. Therefore, it is necessary to look up the organization which filed the patent application as first applicant.

The cases in which a transfer of ownership occurs after the filing of the patent application are not critical. It is very easy to clarify these cases by looking up who actually filed the application.(EPO, 2018c) In these cases it is not sufficient to determine the current holder of the patent application.

Transfer of the invention by treaty before filing

Case 1 (OI with-an-external-inventor):

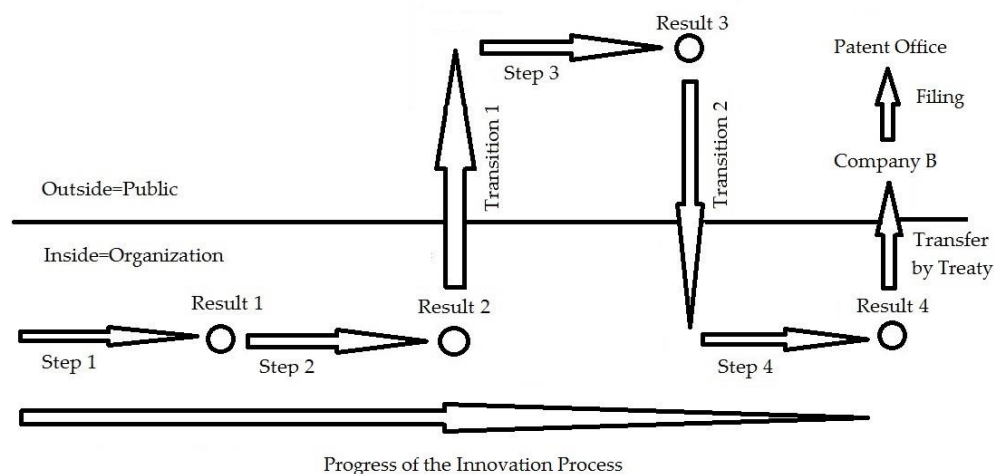


Figure 45: Filing after transfer: OI with-an-external-inventor

Problem

The applicant is not the organization that carried out the innovation process. For this reason, the information in the patent registers leads to a misinterpretation. It is assumed on these wrong assumptions, that the invention is based on external inventors.

Solution

The basis of the conclusion is wrong. However, the conclusion itself is correct, since the organization that carried out the innovation process actually engaged at least one external inventor.

Case 2 (firm-to-firm OI with-an-external-inventor):

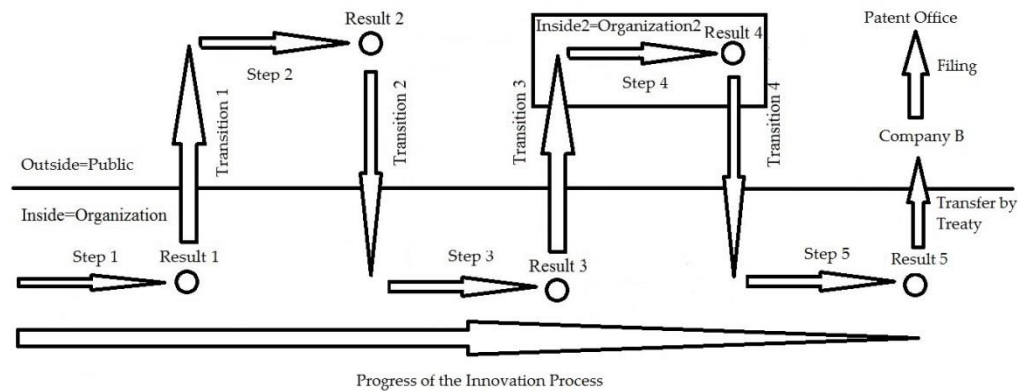


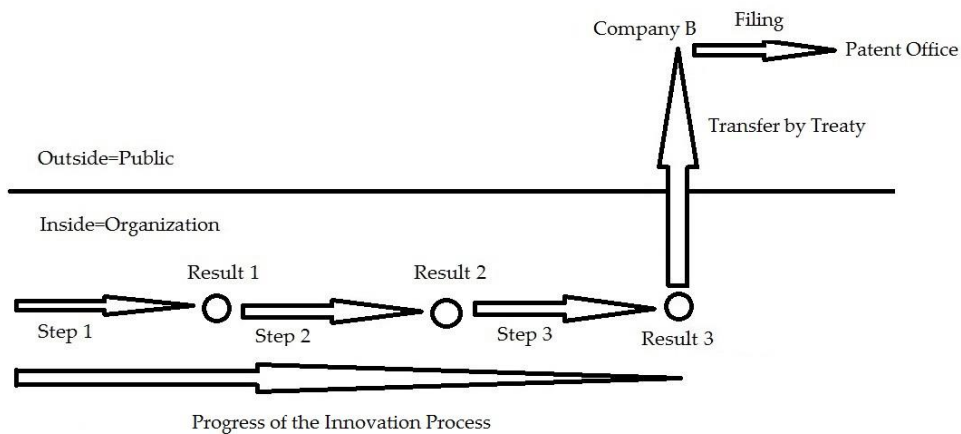
Figure 46: Filing after transfer: firm-to-firm OI with-an-external-inventor

Problem

The applicant is not the organization that carried out the innovation process. For this reason, the information in the patent registers leads to a misinterpretation. It is assumed on these wrong assumptions, that the invention is based on external inventors.

Solution

The basis of the conclusion is wrong. However, the conclusion itself is correct, since the organizations that carried out the innovation process actually employed at least one external inventor.

Case 3 (Closed Innovation):**Figure 47: Filing after transfer: CI****Problem**

In the situation depicted by the figure 47 the organization conferred the invention to a company B. This company B files the patent application with the patent office. The company B will declare that it has obtained the right of the invention by contract and not as an employer. Therefore, it is assumed that there is an OI with-an-external-inventor (if only one company acquires the invention or a firm-to-firm OI with-an-external-inventor if two or more companies acquire the invention together) and not a CI invention, because the inventors of the steps 1, 2 and 3 are not employees of company B. This is, however, a misapprehension, because the creation of the invention took within an organization as CI place. In this case, the information in the patent register leads to a fallacy. An OI with-an-external-inventor or a firm-to-firm OI with-an-external-inventor is assumed erroneously instead of a CI invention.

Solution

Therefore, it can be trusted if there is a CI because of an employer-employee-relationship.(Keukenschrijver, 2016k) It must be doubted that there is an OI with-an-external-inventor invention or a firm-to-firm OI with-an-external-inventor invention, because it is possible that there is a transfer by agreement before filing.

Case 4 (firm-to-firm OI):

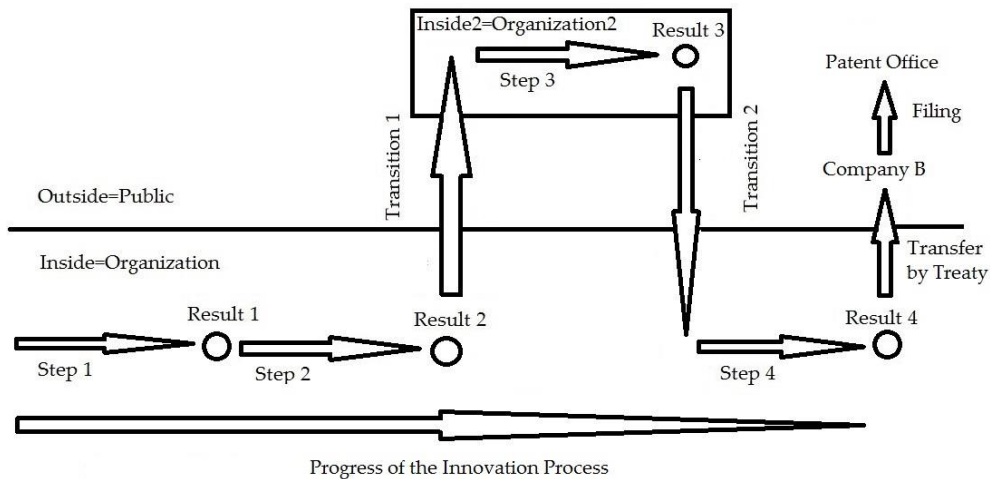


Figure 48: Filing after transfer: firm-to-firm OI

Problem

Figure 48 shows a situation of a firm-to-firm OI, whereby the invention is transferred by a contract after its creation and before filing with the patent office. Here, the patent registers give the erroneous impression of an OI with-an-external-inventor OI (or a firm-to-firm OI with-an-external-inventor if two or more firms have acquired the invention together) instead of a firm-to-firm OI.(DPMA, 2018b; EPO, 2018c)

Solution

It can summarized, that if there is a CI or firm-to-firm OI innovation process identified by the information of the patent registers, this can be taken for sure.(DPMA, 2018b; EPO, 2018c) If an OI with-an-external-inventor or a firm-to-firm OI with-an-external-inventor innovation process is assumed, it could be also one of CI or firm-to-firm OI.

A change of ownership of the invention before the filing of a patent application can lead to a misapprehension. In this case, the information of the patent registers may indicate that it is an OI invention with an external inventor, although a CI or a firm-to-firm OI invention is actually present.

11.10 COMPARISON OF THE YEARS 2000 AND 2015

Data of two years were examined in order to analyze the developments of the innovation methods.

11.10.1 Sampling

The GPTO's DEPATIS.net database is used to identify the patent applications of the years 2000 and 2015. The data in this database can be searched through using search formulas.(DPMA, 2018c) The identified patent applications have to be inspected for the innovation method used.

The patent register of the GPTO cannot be used to examine the patent applications found, because it does not reveal for every patent application the designation of the inventor and the request for grant of a patent. Online file inspection of the German patent register is not available for all files.(Keukenschrijver, 2016h Rdn. 84) Therefore, the patent register of the EPO is used to see the documents needed.(EPO, 2018c, 2018a, 2018b)

Therefore, only those patent applications can be used which have been filed both in Germany, whereby the GEIA is valid, and as a European patent application, whereby it can be inspected online in the European patent register. For this reason, only those applications can be included in the empirical studies which were first filed with the GPTO as a German initial patent application and then filed with the EPO as a subsequent patent application claiming the priority of the German initial patent application.

11.10.2 Search Formulas

Search formulas are developed to find the relevant patent applications in the database DEPATISnet.de.

There are several restrictions to the sampling:

- There is an eighteen months period of secrecy.(Keukenschrijver, 2016h Rdn. 53; Rudloff-Schäffer, 2017a Rdn. 33) Therefore, it was not possible to proceed the sampling with current patent applications.
- Only German organizations were examined, because in Germany there is the GEIA, which enables the employer to acquire an invention of an employee.(Keukenschrijver, 2016k Rdn. 4-13; Kraßer and Ann, 2016, §21 Rdn. 66-81) This legal transfer has to be declared before the patent office

concerned. If the inventors are employees of the organization then there is CI or firm-to-firm OI. If at least one inventor is not an employee, there is OI with-an-external inventor or firm-to-firm OI with-an-external-inventor.

- On the other hand not all files of the GPTO can be searched actually via online file inspection. Indeed, online file inspection is only possible for the files of the DPMA of those patent applications which have been granted or filed and already disclosed from 21.01.2013.(Keukenschrijver, 2016h Rdn. 84; DPMA, 2018g)
- The EPO's patent register enables file inspection of all files from the year 2000 onwards.(EPO, 2018c)

Priority country

It is important that the patent application is registered in Germany as the first country, since the GEIA is valid in Germany. The GEIA enables an employer to take over an employee's invention.(Keukenschrijver, 2016k Rdn. 4-13; Kraßer and Ann, 2016, §21 Rdn. 66-81) Further, the employer must declare that he got the property of an invention of his employee because of the employer-employee-relationship.(Moufang, 2017f) Fortunately for the purposes of the thesis, this declaration reveals whether there is an external inventor or not and therefore the distinction between the group 1 of innovation methods and the group 2 of innovation methods is possible.

Germany must therefore be the country, where the patent application is filed first. Due to patent law a succeeding European patent application claiming the priority of the German patent application is filed. By claiming the priority of the first patent application according to article 87 EPC the seniority of the first patent application can be retained for the European patent application.(Bremi, 2016; Moufang, 2017i; Visser, 2017, pp. 192–200)

Therefore, the search formulas to search in the database DEPATISnet.de comprise (DPMA, 2018f):

- PRC=DE: Priority country is Germany

Application country

In Germany there is meanwhile an online file inspection, which enables the inspection of the designation of the inventor and the request for grant of a patent. However, only few files of the GPTO are available online actually. In contrast, as of 2000, all the files of the EPO are available online. It is therefore

necessary to choose the European region according to the EPC as application country.

Therefore, the search formulas comprise additionally (DPMA, 2018f):

- AC=EP: Application country is the European region

Organization

CI and OI are processes for the creation of innovations, whereby an organization initiates and maintains the innovation process. For this reason, only the patent applications of organizations are analyzed.

Important variants of organizations are the following (Theis, 1994, p. 3; Lober and Just, 2010; Loose *et al.*, 2011, p. 163; Hahn, 2017; Borkenhagen, 2018; Für-Gründer.de, 2018):

- GmbH
- UG (haftungsbeschränkt)
- KG
- Aktiengesellschaft (AG)
- PartG
- OHG

Universities can also file patent applications as organizations:

- Hochschule
- Universität (university)
- Fachhochschule

This results in the proportion of the search formulas that looks for the organizations (DPMA, 2018f):

- (PA=?GmbH ODER PA=?Universität ODER PA=?Aktiengesellschaft ODER PA=?Hochschule ODER PA=?KG ODER PA=?AG ODER PA=?UG ODER PA=?OHG ODER PA=?University ODER PA=?Fachhochschule ODER PA=?PartG).

Application day

The filing date is also indicated:

- AD=30.09.2000: Application date for example September 30, 2000

Resulting search formulas

The resulting search formula for the year 2000 is:

AD=30.09.2000 UND (PA=?GmbH ODER PA=?Universität ODER PA=?Aktiengesellschaft ODER PA=?Hochschule ODER PA=?KG ODER PA=?AG ODER PA=?UG ODER PA=?OHG ODER PA=?University ODER PA=?Fachhochschule ODER PA=?PartG) UND PRC=DE UND AC=EP.

The resulting search formula for the year 2015 is:

AD=30.09.2015 UND (PA=?GmbH ODER PA=?Universität ODER PA=?Aktiengesellschaft ODER PA=?Hochschule ODER PA=?KG ODER PA=?AG ODER PA=?UG ODER PA=?OHG ODER PA=?University ODER PA=?Fachhochschule ODER PA=?PartG) UND PRC=DE UND AC=EP.

It has been found that international patent applications, which were filed on the basis of the Patent Cooperation Treaty (PCT), are not filtered out. These patent applications must be excluded by hand for the results of both research formulas, because the files of these patent applications do not disclose if there is an employer-employee-relationship between the organization concerned and the inventors.

The search formulas were used for several days (AD: application date). The results represent the respective samples.

11.10.3 Representativity

It is assumed that individual days of the years 2000 and 2015 are homogeneous with respect to the kinds of innovation methods, which resulted in the patent applications. It is therefore assumed that a particular day will not show any other results than another day due to its particular date. It is not reasonable that the choice of days has an influence on the innovation behavior of the organizations. On the other hand, it is assumed that the results of one day are heterogeneous, as it is not reasonable to assume that the particular date of the day will have any influence on innovation activity. For this reason, a cluster sample plan can be carried out in which the patent applications are examined for individual days in 2000 and 2015. A full survey is conducted for these randomly selected days, so that a one-stage cluster sample plan is carried out. (Bortz, 1984, p. 300; Götze, Deutschmann and Link, 2002, p. 248; Bortz and Döring, 2006, p. 436)

A cluster sample plan represents a form of restricted random selection, since the population, in this case all patent applications of one year, is divided into subpopulations, i.e. the patent applications of certain days of the year. The subpopulations represent the clusters.(Weigand, 2006, p. 247; Deinzer, 2007, p. 66; Griffiths, 2009, p. 433)

It must be clarified whether the results can be considered as representative. Firstly, the results were randomly selected. For this purpose, days of the corresponding year were randomly selected and the patent applications of these days were examined.

The total number of relevant patent applications for the year 2000 is determined using the following search formula:

```
(AD>31.12.1999 UND AD<01.01.2001) UND (PA=?GmbH ODER
PA=?Universität ODER PA=?Aktiengesellschaft ODER PA=?Hochschule ODER
PA=?KG ODER PA=?AG ODER PA=?UG ODER PA=?OHG ODER
PA=?University ODER PA=?Fachhochschule ODER PA=?PartG) UND PRC=DE
UND AC=EP
```

In 2000, a total of 34752 relevant patent applications were filed.(DPMA, 2018c)(see annex "Representativity")

With a population size of 34752 applications, 380 samples would be required to achieve a confidence level of 95% and an error span of 5%. The population is the entire group about which you want to gain knowledge. The confidence level indicates the reliability of a measure. A confidence level of 95% means that if the same survey is repeated 100 times, the measure would be 95 times within the error span. The error span is also called confidence interval and represents the permissible deviation from the correct value.

A total of 775 samples were taken in this empirical study. For this reason, a confidence level of 95% and an error span of 5% are ensured.(von der Lippe, 2011, pp. 3–6)

The total number of relevant patent applications for the year 2015 is determined using the following search formula:

```
(AD>31.12.2014 UND AD<01.01.2016) UND (PA=?GmbH ODER
PA=?Universität ODER PA=?Aktiengesellschaft ODER PA=?Hochschule ODER
PA=?KG ODER PA=?AG ODER PA=?UG ODER PA=?OHG ODER
```

PA=?University ODER PA=?Fachhochschule ODER PA=?PartG) UND PRC=DE
UND AC=EP

In 2015, a total of 26168 relevant patent applications were filed.(DPMA, 2018c)(see annex "Representativity")

With a population size of 26168 applications, 379 samples would be required to achieve a confidence level of 95% and an error span of 5%. A total of 496 samples were taken in this empirical study. For this reason, a confidence level of 95% and an error span of 5% are ensured.(von der Lippe, 2011, pp. 3–6)

Only those samples could be taken which were submitted to the GPTO as initial priority patent application and to the EPO as subsequent application. Only with such a combination an assessment and an inspection of files is possible.

11.10.4 Data

First, it can be noted that the number of patent applications has been reduced from 775 in the year 2000 to 496 in the year 2015. Same applies for the patent applications of firm-to-firm OI (11 to 6) and with respect to the patent applications of OI with-an-external-inventor (109 to 57). The number of patent applications of CI was also reduced from 649 to 433. In 2000 there were 6 firm-to-firm OI with-an-external-inventor patent applications. In 2015, there was not a single patent application due to firm-to-firm OI with-an-external-inventor.

A finding of the absolute numbers is that there is a "ranking". Most patent applications are CI innovations, wherein the gap between the numbers of CI innovations and the OI innovations is great. The second-largest group are OIs with-an-external-inventor and the next group with a lower number of patent applications is firm-to-firm OIs. The firm-to-firm OI with-an-external-inventor can be described as irrelevant. This ranking is valid for both years 2000 and 2015.(See annexes "Data 2000" and "Data 2015")

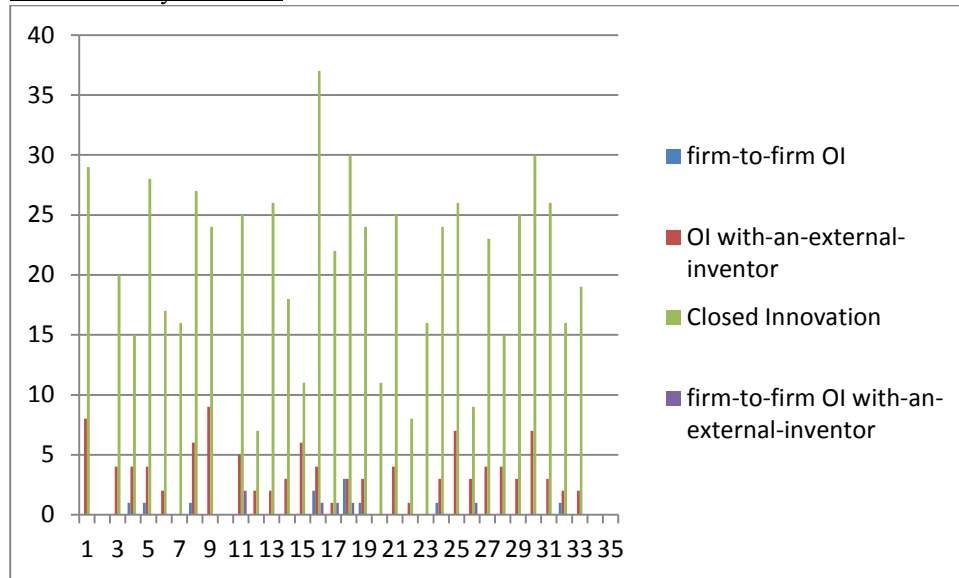
Data of the year 2000

Figure 49: Applications per day of innovation methods for 2000

The x-axis of the figure 49 shows the days that have been examined and the y-axis shows the number of applications for the respective type of innovation method. Figure 49 shows that during the course of the year 2000 the daily number of patent applications of the different types of innovation methods varies, but nevertheless reveals a clear ranking. Patent applications under a CI procedure dominate and patent applications under OI with-an-external-inventor are more frequent than those under firm-to-firm OI. Patent applications according to firm-to-firm OI with-an-external-inventor can be neglected.

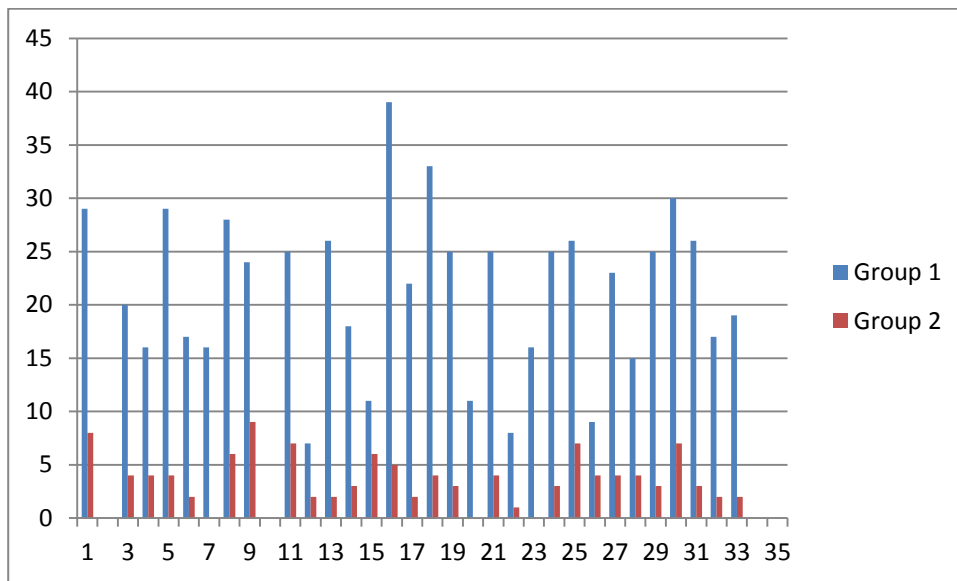


Figure 50: Applications per day of groups 1 and 2 for 2000

Figure 50 shows the patent applications belonging to group 1 and group 2. The patent applications of group 1 outweigh the patent applications of group 2.

With regard to the absolute figures, it should be noted that only those patent applications can be considered which are initially filed as a German first patent application and then as a European subsequent patent application. Of course, there are additionally European patent applications filed as patent applications without claiming a priority of a patent application or as patent applications claiming a priority of a non-German patent application.

Data of the year 2015

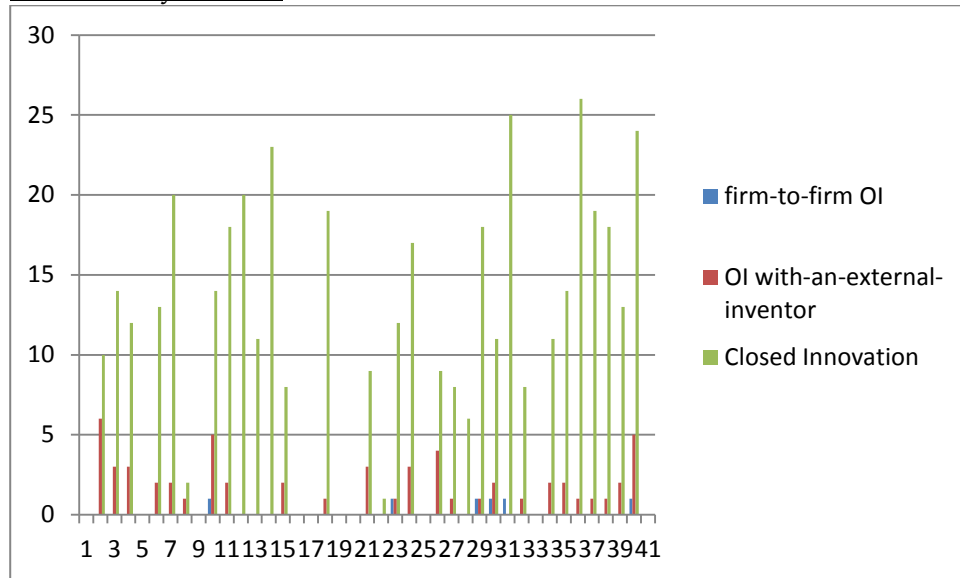


Figure 51: Applications per day of innovation methods for 2015

The x-axis of the figure 51 shows the days that have been examined and the y-axis shows the number of applications for the respective type of innovation method. Figure 51 illustrates the predominance of patent applications according to the CI innovation method compared to other innovation methods. The figure 51 shows that patent applications according to OI with-an-external-inventor are more frequent than firm-to-firm OI patent applications, but are rare compared to CI patent applications. There are no firm-to-firm OI with-an-external-inventor patent applications.

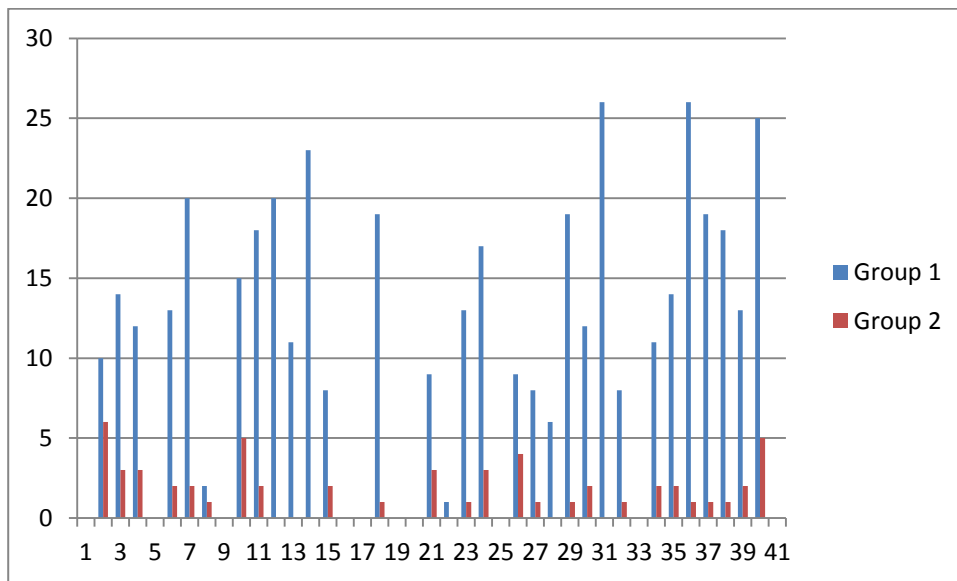


Figure 52: Applications per day of groups 1 and 2 for 2015

Figure 52 shows the patent applications belonging to group 1 or group 2. The patent applications of group 1 outweigh the patent applications of group 2.

11.10.5 T-Test

The t-test is applied to evaluate the data. For the proper functioning of the t-test the presence of a normal distribution is less relevant for large sample sizes. However, if there are unequal variances, a Welch two sample t-test must be used. (Rudolf and Kuhlisch, 2008, p. 163) Therefore, a comparison of the variances was made, wherein the Levene-test was used. (Wollschläger, 2017, p. 233) If necessary, the Welch two-sample t-test was used, otherwise the t-test for equal variances was applied.

The following statements were found to be significant by the t-test:

- average value (CI: 2000) > average value (CI: 2015)
- average value (OI with-an-external-inventor: 2000) > average value (OI with-an-external-inventor: 2015)
- average value (firm-to-firm OI with-an-external-inventor: 2000) > average value (firm-to-firm OI with-an-external-inventor: 2015)

Therefore, these average values have decreased significantly in 2015 compared to 2000. It could not be determined that the average value (firm-to-firm OI: 2000) is significantly higher than the average value (firm-to-firm OI: 2015).

- average value (CI: 2000) > average value (OI with-an-external-inventor: 2000)
- average value (CI: 2000) > average value (firm-to-firm OI: 2000)
- average value (CI: 2000) > average value (firm-to-firm OI with-an-external-inventor: 2000)

In 2000, the significant most frequent patent applications were those of the CI.

- average value (CI: 2015) > average value (OI with-an-external-inventor: 2015)
- average value (CI: 2015) > average value (firm-to-firm OI: 2015)
- average value (CI: 2015) > average value (firm-to-firm OI with-an-external-inventor: 2015)

In 2015, the significant most frequent patent applications were those of the CI.

- average value (OI with-an-external-inventor: 2000) > average value (firm-to-firm OI: 2000)
- average value (OI with-an-external-inventor: 2000) > average value (firm-to-firm OI with-an-external-inventor: 2000)

In 2000, the significant second most frequent patent applications were those of the OI with-an-external-inventor.

- average value (OI with-an-external-inventor: 2015) > average value (firm-to-firm OI: 2015)
- average value (OI with-an-external-inventor: 2015) > average value (firm-to-firm OI with-an-external-inventor: 2015)

In 2015, the significant second most frequent patent applications were those of the OI with-an-external-inventor.

- average value (firm-to-firm OI: 2015) > average value (firm-to-firm OI with-an-external-inventor: 2015)

In 2015, the significant third most frequent patent applications were those of firm-to-firm OI. Therefore, the least frequent patent applications were those of firm-to-firm OI with-an-external-inventor for 2015. It could not be determined

that the average value (firm-to-firm OI: 2000) is significantly higher than the average value (firm-to-firm OI with-an-external-inventor: 2000).

Concerning the patent applications due to group 1 and group 2:

- average value (group 1 of innovation methods: 2000) > average value (group 2 of innovation methods: 2000)
- average value (group 1 of innovation methods: 2015) > average value (group 2 of innovation methods: 2015)

Both in 2000 and 2015 there were significantly more patent applications due to CI and firm-to-firm OI (group 1) than those due to OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor (group 2).

Summary

Significantly fewer CI, OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor patent applications were filed in 2015 compared to 2000.

The figures show that CI is dominant compared to any other type of innovation method. With regard to the three OI types of innovation methods, firm-to-firm OI, OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor, the t-test has shown that there are significantly more patent applications due to OI with-an-external-inventor than due to firm-to-firm OI and firm-to-firm OI with-an-external-inventor. This result applies to both years 2000 and 2015. Patent applications for firm-to-firm OI with-an-external-inventor can be neglected. Therefore, the t-test has shown that there is a ranking of the types of innovation methods that has not changed in the years 2000 and 2015.

The subquestions of the tenth research question can be answered as follows using the t-test:

- **Are there more OI with-an-external-inventor patent applications than CI patent applications or vice versa?** There are significant more patent applications for both years 2000 and 2015 due to CI than due to OI with-an-external-inventor.
- **Are there more firm-to-firm OI with-an-external-inventor patent applications than firm-to-firm OI patent applications or vice versa?** For the year 2015 there are significant more patent applications due to firm-to-firm OI than due to firm-to-firm OI with-an-external-inventor. The t-test of the average values of patent applications of firm-to-firm OI

and firm-to-firm OI with-an-external-inventor for the year 2000 is not significant.

- **Are there more group 2 patent applications than group 1 patent applications or vice versa?** There are significant more patent applications for both years 2000 and 2015 due to group 1 than due to group 2.

Therefore, the findings of the thesis cannot be falsified by the results of the t-test.

Criticism

In this thesis only a comparison of the years 2000 and 2015 was made. It would be possible to carry out a corresponding statistical survey for the years in between, i.e. from 2001 to 2014. However, such an evaluation requires enormous effort. It is also very questionable that this would lead to new findings.

The online file inspection of the GPTO is limited.(Keukenschrijver, 2016h Rdn. 84; DPMA, 2018g) However, the EPO online file inspection was possible for both years 2000 and 2015.(EPO, 2018c) It was therefore necessary that the patent application in question was also available as a European patent application. Only thereby it could be ensured that the type of transfer of the invention from the inventor to the organization could be determined by looking up the designation of the inventor.(DPMA, 2018d; EPO, 2018b) Therefore, only those patent applications which were filed as a German patent application and subsequently as a European patent application by claiming the priority of the first patent application could be examined.(Breimi, 2016; Moufang, 2017i)

11.10.6 Mean values of the years 2000 and 2015

The number of applications per day (mean value) for each of the four types of innovation methods is calculated.(See annexes "Mean Values of the Year 2000" and "Mean Values of the Year 2015")

Table 33: Mean values of CI and variant 1

	Closed Innovation	OI with-an-external-inventor
2000	18,54	3,11
2015	10,56	1,39

Table 34: Mean values of variants 2 and 3

	firm-to-firm OI	firm-to-firm OI with-an-external-inventor
2000	0,31	0,17
2015	0,15	0

Table 35: Mean values of groups 1 and 2

	Group 1	Group 2
	CI + firm-to-firm OI	OI with-an-external-inventor + firm-to-firm OI with-an-external-inventor
2000	18,86	3,29
2015	10,71	1,39

Table 36: Mean values of all patent applications

	all patent applications
2000	22,14
2015	12,1

The number of patent applications has approximately halved (from 22.14 to 12.1). Therefore, in 2015, more or less only half as many patent applications were filed per day as in 2000.

The number of patent applications of CI has declined, but it has developed slightly better than the trend of the average numbers of all patent applications.

The number of patent applications of OI with-an-external-inventor has more than halved from 2000 to 2015.

The number of firm-to-firm OI patent applications has from the year 2000 to the year 2015 slightly more than halved.

The innovation type firm-to-firm OI with-an-external-inventor can be ignored due to the rare occurrence in 2015 and the fact that it will not occur at all in 2015.

Although firm-to-firm OI is compatible with patent law, firm-to-firm OI results in significantly fewer patent applications in 2015 than in 2000. In contrast to this, the importance of CI is increasing. CI is responsible for significantly more patent applications in 2015 than in 2000 compared to the other innovation methods.

Summarizing the above mentioned it is not possible to falsify the findings of the theoretical part of the thesis. Indeed, there are more patent applications according to the group 1 innovation methods than to the group 2 innovation methods. Further, the innovation methods with an external inventor always result in less patent applications than the corresponding innovation methods without external inventors (CI versus OI with-an-external-inventor and firm-to-firm OI versus firm-to-firm OI with-an-external-inventor).

11.10.7 Probabilities of the years 2000 and 2015

The probability for each innovation method is calculated on the basis of the samples of the years 2000 and 2015.

Table 37: Probabilities of CI and variant 1

	Closed Innovation	OI with-an-external-inventor
2000	83,74%	14,06%
2015	87,3%	11,49%

Table 38: Probabilities of variants 2 and 3

	firm-to-firm OI	firm-to-firm OI with-an-external-inventor
2000	1,42%	0,008%
2015	1,21%	0%

Table 39: Probabilities of groups 1 and 2

	Group 1	Group 2
	CI + firm-to-firm OI	OI with-an-external-inventor + firm-to-firm OI with-an-external-inventor
2000	85,16%	14,84%
2015	88,51%	11,49%

The evaluation of the probabilities shows that there has been a decrease in the probability of OI innovation methods from the year 2000 to the year 2015. The probability for a firm-to-firm OI decreased slightly from 1,42% to 1,21%. The probability of OI with-an-external-inventor decreased from 14,06% to 11,49%. In 2000, the probability for a firm-to-firm OI with-to-external-inventor was 0.008%.

In 2015 it was zero. By contrast, the probability of a patent application resulting from a CI innovation method increased from 83,74% to 87,3%.

There are more patent applications according to the group 1 innovation methods than to the group 2 innovation methods. Further, the innovation methods with an external inventor always result in less patent applications than the corresponding innovation methods without external inventors (CI versus OI with-an-external-inventor and firm-to-firm OI versus firm-to-firm OI with-an-external-inventor). These results are valid for both years 2000 and 2015. Therefore, it is not possible to falsify the findings of the theoretical part of the thesis.

11.10.8 Shares in the groups

The shares of the individual innovation method in the respective groups are calculated.

Table 40: Shares of group 1

	Group 1	
	CI	firm-to-firm OI
2000	98,33%	1,67%
2015	98,63%	1,37%

Table 41: Shares of group 2

	Group 2	
	OI with-an-external-inventor	firm-to-firm OI with-an-external-inventor
2000	94,78%	5,22%
2015	100%	0%

It turns out that CI absolutely dominates in group 1 and that the same applies to OI with-an-external-inventor in group 2.

As shown above, CI is significantly more common than OI with-an-external-inventor so that it can be concluded that CI dominates the inventions for which patents are filed.

11.11 TREND DEVELOPMENTS OF A SEGMENT OF INDUSTRY

Trend developments of CI, firm-to-firm OI, OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor are presented on the basis of a segment of the industry. The industrial segment randomly chosen is defined by the IPC class H03. IPC stands for International Patent Classification, with which the patent office classifies technical areas.(DPMA, 2018e) The Advanced Search of the EPO's patent register is used.(EPO, 2018d) The same methodology was used as for the surveys in 2000 and 2015.(See annex "Trend Developments")

The IPC class H03 represents those patent applications dealing with basic electronic circuits. Basic electronic circuits are those used to generate oscillations, modulation, demodulation or transmission of a modulation from one carrier to another. Further, basic electronic circuits comprise amplifiers, gain control circuits, impedance networks, for example resonant circuits; resonators, tuning of resonant circuits, selection of resonant circuits, pulse technology, automatic control or regulation, synchronization or stabilization of electronic vibration or pulse generators and encoding, decoding or code conversion.(DPMA, 2018e)

Table 42: Trend developments 2001-2007

	2001	2002	2003	2004	2005	2006	2007
CI	71	53	61	40	70	75	71
OI with-an-external-inventor	13	14	9	10	8	13	2
firm-to-firm OI	1	1	1	1	0	0	0
firm-to-firm OI with-an-external-inventor	0	0	0	0	0	0	0
Group 1	72	54	62	41	70	75	71
Group 2	13	14	9	10	8	13	2

Table 43: Trend developments 2008-2014

	2008	2009	2010	2011	2012	2013	2014
CI	37	41	42	47	32	34	39
OI with-an-external-inventor	6	5	2	5	2	2	6
firm-to-firm OI	0	0	1	1	1	0	1
firm-to-firm OI with-an-external-inventor	0	0	0	0	0	1	0
Group 1	37	41	43	48	33	34	40
Group 2	6	5	2	5	2	3	6

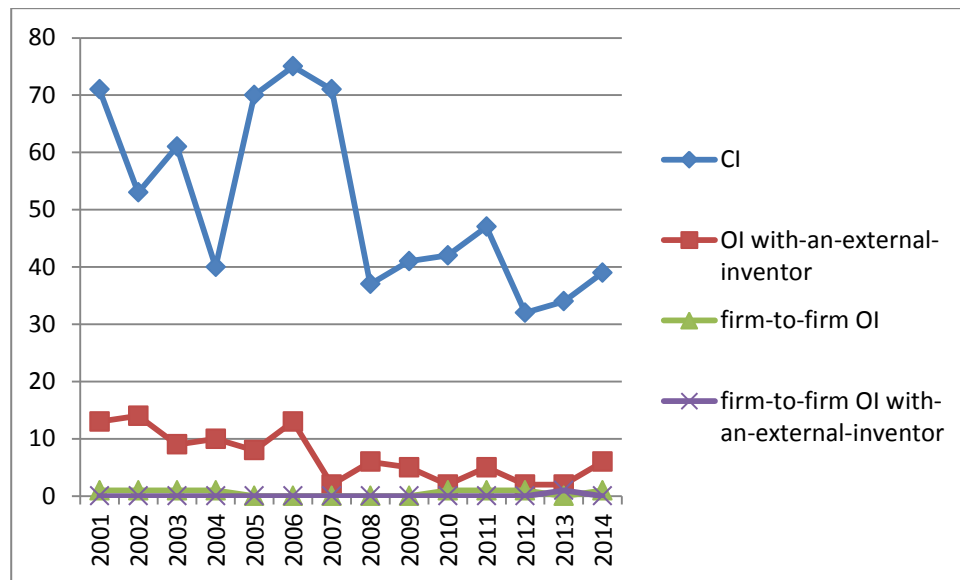


Figure 53: Trend developments of the innovation methods

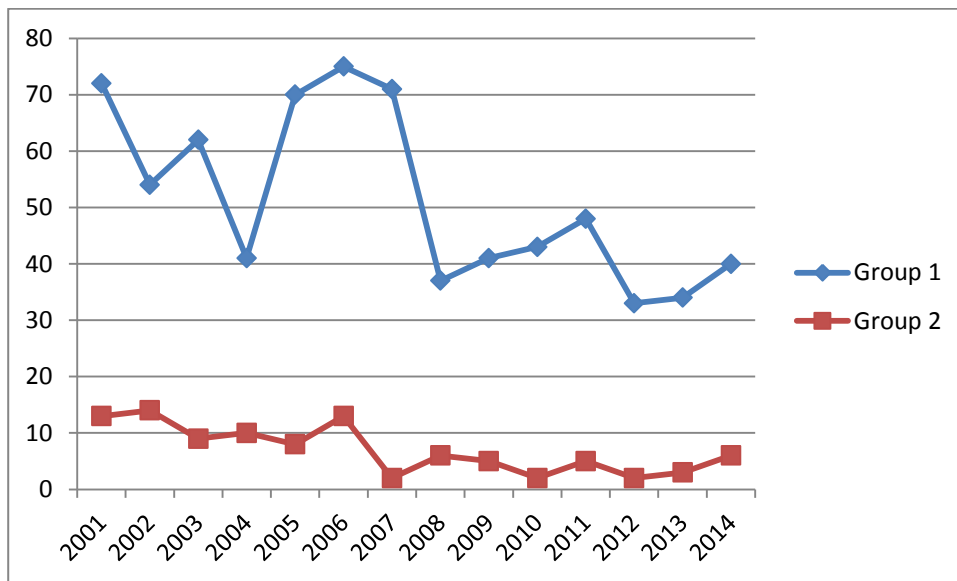


Figure 54: Trend developments of groups 1 and 2

The trend development confirms the statements above. The majority of patent applications are those of CI projects. There is a decline of the CI patent applications from 2001 to 2014. Further, there are always more patent applications because of OI with-an-external-inventor than because of firm-to-firm OI. The innovation type firm-to-firm OI with-an-external-inventor can be ignored.

A comparison of the figures 53 and 54 shows that group 1 is dominated by CI patent applications and that group 2 is dominated by OI with-an-external-inventor patent applications. In addition, the figures 53 and 54 illustrate that CI is the absolutely dominant type of innovation method.

Therefore, the analysis of a branch of industry over the years 2001 to 2014 shows that group 1 innovation methods led to more patent applications than group 2 innovation methods. Moreover, innovation methods with external inventors led to fewer patent applications than the corresponding innovation methods without external inventors. The findings of the thesis cannot be falsified by the trend development of this branch of industry.

11.12 ANSWER TO THE TENTH RESEARCH QUESTION

It was empirically found that the overwhelming majority of inventions filed as patent applications in Germany resulted from CI innovation projects. (Meitinger,

2017b) In another empirical study in 2015, 364 patent applications were analyzed. Only three patent applications resulting from a R&D cooperation were found. Therefore, only three inventions emerged from a firm-to-firm OI. In addition, 39 patent applications arising from an OI with-an-external-inventor were identified. The remaining patent applications were identified as CI innovations. There was therefore a ratio for 2015 of 88.5% CI inventions to 11.5% OI inventions filed as patent applications.(Meitinger, 2017c)

The examination of this thesis was carried out with a total of 496 patent applications in 2015 and 775 patent applications in 2000. The ratio of CI to OI patent applications is 87% to 13% in 2015 and 84% to 16% in 2000. Therefore, CI is dominant with patent applications compared to OI.

The question is: why dominates CI the number of patent applications? There may be different answers to this question. Patent law may prevent the successful application of OI. This argument is supported by the fact that patent law and OI with-an-external-inventor are not completely compatible and that only a few patent applications result from OI with-an-external-inventor. On the other hand, firm-to-firm OI and patent law are fully compatible and yet there are only a few patent applications due to firm-to-firm OI. In fact, there are even less patent applications based on firm-to-firm OI than due to OI with-an-external-inventor.(Meitinger, 2017c) This "ranking" of innovation methods and the dominance of CI over OI has not changed from 2000 to 2015, although one could have assumed that OI would have continued to establish itself.

The empirical studies have shown that innovation methods with an external inventor led to fewer patent applications than the corresponding innovation methods without external inventors. This was attributed to the fact that the corresponding innovation methods are not compatible with patent law. Therefore, the theoretical results could not be falsified. In principle, it would be conceivable that it is not the existence of the external inventor that is responsible for the filing or waiving of a patent application, but in particular the specificity of the organization concerned. For this reason, the organizations carrying out innovation methods with external inventors were roughly compared with those organizations carrying out innovation methods without external inventors. No obvious differences in criteria such as company size, industrial sector, etc. were found.

It can be stated that CI dominates in group 1 and OI with-an-external-inventor dominates in group 2. Further, there are significantly more CI patent applications than OI with-an-external-inventor patent applications. This

means that CI results to the most of inventions for which patent applications are filed.

Further, innovation methods with an external inventor result in less patent applications than the corresponding innovation methods without external inventors. There are more patent applications due to CI than due to OI with-an-external-inventor. There are more patent applications due to firm-to-firm OI than due to firm-to-firm OI with-an-external-inventor. Finally, there are more patent applications because of group 1 innovation methods than because of group 2 innovation methods. Therefore, the empirical studies cannot falsify the findings of the theoretical part of the thesis.

12 PROPOSALS TO AMEND PATENT LAW

The first chapters of the thesis were concerned about the impact of the existing patent law on OI. Considerations are also to be made beyond this. Proposals how to make things better are a logical succeeding step. In particular, such proposals are to be drawn up which support an OI project that is dealt with an OI with-an-external-inventor innovation method or a firm-to-firm OI with-an-external-inventor innovation method.

12.1 ELEVENTH RESEARCH QUESTION

Proposals are being prepared which lead to a better harmonization of OI and patent law.

Eleventh research question

Which amendments of patent law make sense from the standpoint of OI?

12.2 OI AND PATENTABILITY

The proposals should enhance the patentability of innovations by OI through limiting or healing the disadvantages of OI from the standpoint of patent law.

Patentability due to patent law particularly includes the two essential criteria of novelty and inventive activity. Both requirements of patentability have as their prerequisite secrecy. If there is a possibility of public access to the invention to be protected by a patent, both requirements are violated and patentability is deleted.

If there are all steps of the innovation process within an organization it can be supposed that secrecy was preserved. OI is characterized by at least one external step of the innovation process. An innovation process with external process steps can be more of a problem with the secrecy.

In order to get this problem under control, it should be possible, on the one hand, to search whether the invention has already been made public. This means determining whether damages have already occurred. On the other hand, it would be helpful if there was a "cure", if the invention reached the public.

12.2.1 Novelty

The openness of OI can lead to an innovation not fulfilling the novelty criterion of patent law. In order to solve this problem, a grace period may be suitable. A grace period is a time period, during which publications of the own invention, which originates from the applicant, will not be regarded with respect to patentability. (Goebel and Engel, 2015a Rdn. 14; Kraßer and Ann, 2016, §16 Rdn. 11; Lindner, 2016b; Moufang, 2017b Rdn. 182-192; Visser, 2017, pp. 102–105)

This time period ends with the filing date or priority date, if a priority is claimed, and starts for example six months earlier, depending on the duration of the time period which the law provides as grace period. (Goebel and Engel, 2015a Rdn. 15; Keukenschrijver, 2016f Rdn. 11)

The point of a grace period is that an applicant should not be punished by publishing his invention. In particular, applicants inexperienced in patent law should be born in mind. These applicants can be protected by a grace period. (Kraßer and Ann, 2016, §6 Rdn. 8)

Due to the openness of the OI approach, a large number of people can be involved in an innovation process. These people may not feel committed to secrecy about the invention. For example, in a crowdsourcing project, many people can be involved in the innovation process. (Geschka and Meitinger, 2016) For this reason, a grace period would be particularly helpful for OI as crowdsourcing.

In Germany, there is a grace period for utility models due to §3(1) sentence 3 GebrMG. The term of the grace period of the GebrMG is six months. (Keukenschrijver, 2016f Rdn. 16) But there is no general grace period for inventions to be protected by patent law. Only in few exceptional cases if the applicant is subject to abuse or if the invention was shown at a special exhibition, the lawmaker grants a grace period due to §3(5) PatG and article 55 EPC. (Keukenschrijver, 2016g Rdn. 175-199; Moufang, 2017b Rdn. 189-192; Visser, 2017, pp. 102–105)

Patent law aims to promote new technologies. (Moufang, 2017a Rdn. 17) A publication of an invention can achieve the same effect. This is a way to introduce a new technology, which fosters the technical development. For this reason, it would be recommendable not to penalize the applicant's publication of his invention. It would therefore be worthy of advice for the lawmaker to introduce a general grace period for patent applications.

Several attempts have already been made to introduce a general grace period for patent law. The last attempt was made in the 17th parliamentary term on March 16, 2010. A request was submitted to the German Bundestag to work on a grace period for European patents. The reason given came from the scientific community, for which early publication is essential. Early publication should not be prevented by the need for novelty in patent law. Reference was made to the example of the USA, which allegedly achieved good results through a grace period. The request was not successful. (Deutscher Bundestag, 2010)

A counter-argument to the introduction of a grace period could be that the applicant should not be double-rewarded. He has opted for the publication. Therefore, it should not be possible for him to get a patent also. Another argument against a grace period is the fear that legal uncertainty could arise. The argument was put forward with the example of a promising technological idea. In this case a grace period leads to uncertainty because after the publication of the technological idea patent applications can be filed, which result in a patent race. (EPO, 1999, pp. 160–161) However, for OI, because of its open nature, the introduction of a grace period would probably be beneficial.

12.2.2 Inventive activity

The introduction of a general grace period in patent law would not only improve the situation for OI innovation projects with regard to the novelty criterion. A grace period would also be advantageous with regard to the criterion of inventive step. (Keukenschrijver, 2016j; Moufang, 2017g)

By a general grace period for patent applications analogous to §3(1) sentence 3 GebrMG, a publication which originates from the applicant would not belong to the prior art. Publications that result from the open nature of OI would therefore be harmless to the patentability of the resulting innovation of the OI innovation project. (Kraßer and Ann, 2016, §6 Rdn. 8)

12.3 OI AND INVENTORSHIP

Inventorship due to patent law comprises several aspects. One aspect is the requirement to identify the inventors to be able to mention them. A further aspect is the property in the invention. These aspects can be difficult with OI with external inventors, since the organization does not have direct access to the external inventors to clarify the identification of the inventors and to acquire the

property of the invention concerned. To solve these problems, the inventorship due to patent law could be amended or even abolished.

12.3.1 Abolition of inventorship

According to the above, inventorship is a problematic aspect of patent law from the point of view of OI. It therefore may make sense to abolish inventorship. Indeed, before 1936 inventions without inventors were accepted by German patent office.(Deutsches Patentamt, 1951) However, it should be borne in mind that actually the inventor's principle is an essential pillar of the current patent law.(Schmidt, 2012; Meitinger, 2017d, p. 149)

The patent law defines an invention as property. The patent law assigns the right to the invention to the inventor in accordance with §6 sentence 1 PatG and article 60(1) sentence 1 EPC.(Keukenschrijver, 2016l; Moufang, 2017l; Visser, 2017, pp. 129–131) Therefore, the abolition of inventorship would solve problems of identification and mention of inventors. On the other hand, there would emit the problem of ownership of the invention.

12.3.2 Amendment of inventor's principle

Actually, the inventor's principle is a column of patent law. There is no way to get rid of the inventor's principle without destroying actual patent law.(Keukenschrijver, 2016l; Moufang, 2017l) On the other hand, the inventor's principle, that means the assumption that inventions can only originate from human beings, could be interpreted in a new way. This could lead to a better harmonization between patent law and OI.

It can be assumed that there is a general know-how of a company. This know-how is the result of some or all employees of the company. Presuming there is an invention because of this know-how and it is not possible to identify the inventive employees, in this case the firm could act as representative of the inventors. The firm would be regarded not as inventor but as the inventor's representative. However, the company may only take in this representative role if the true inventor cannot be found at reasonable effort.(Meitinger, 2017d, p. 149)

If the lawmaker were to allow a company to be mentioned as an inventor, or as a representative of the inventor, instead of a human being, another problem could arise. In the past, there was already the possibility to mention companies as inventors. This led to cases, where the real inventors were not mentioned.

The aim of this was to save time and money for the company concerned.(Mediger, 1952, p. 67)

This possibility of abuse must be ruled out. This danger can be avoided by an additional rule, which interdicts that solely an organization is mentioned as an inventor. The proposal is to allow only the firm as an additional inventor besides a person as inventor. At least the biggest abuse cases should be excluded by such a provision.(Meitinger, 2017d, p. 149) Such an opening of the inventor's principle would be more appropriate, since the general know-how could actually be taken into account when assigning the inventorship.

From the viewpoint of OI, additional advantageous results are obtained. It could be prevented that a company, which initiated a crowdsourcing project, loses the right to the invention resulting from for example a crowdsourcing project. The company can become an inventor in addition to the inventive crowd members.(Meitinger, 2017d)

However, this regulation, which is advantageous for OI, would lead to another problem. The problem is to make sure that all inventors, who become co-applicants and who can be economically differently strong, will profit from the exploitation of the invention. If one co-inventor is a private person and another co-inventor is a firm, the firm is preferred in the possibility of exploitation of the invention. Possibly, the company's market power even prevents the private person from harvesting profits from the invention.(Fischer, 1977; BGH, 2005; Henke, 2007)

It would be recommendable if the private person as co-inventor would receive compensation payments by the co-inventor company, which indeed exploits the invention. The case law provides a different procedure. No member of the inventor's community is obliged to financial compensations to other members, which are not able to use the invention. The inventive crowd member is therefore disadvantaged in comparison with the company in the exploitation of the invention.(BGH, 2005) This problem of the missing financial compensation of an economically considerably weaker co-inventor should be solved by the lawmaker.

12.3.3 Law for crowdsourcing analogue to GEIA

A special law is recommended to solve the problems of crowdsourcing with the patent law. This is only about crowdsourcing as OI, which can lead to an

invention. The use of a crowd for processing of homogeneous and repeating activities, is not meant by crowdsourcing as OI.(Meitinger, 2016, pp. 532–533)

An employer-employee-relationship can result in a legally controversial situation if the employee is an inventor. In this case the employee is the owner of the invention according to §6 sentence 1 PatG and article 60(1) sentence 1 EPC.(Melullis, 2015b; Visser, 2017, pp. 129–131) However, the employer is entitled to claim the employee's work due to labor law, which may comprise the invention of the employee. Thus, there may be a contradiction between labor law and patent law. In Germany this collision of two laws is resolved by the GEIA.(Keukenschrijver, 2016k; Kraßer and Ann, 2016, §21)

Due to the GEIA the employer is entitled to acquire the invention. The inventor, the employee, gets a right to financial compensation. According to §6(1) GEIA, the employer can claim an invention of his employee. Due to §7(1) GEIA, all asset rights of the invention are conferred to the employer by the claim according §6(1) GEIA. These regulations often appear to be appropriate since the inventor is typically not in such a condition to exploit the invention economically. The inventor is mostly interested in financial compensation. On the other hand, the employer wants typically to obtain the invention. GEIA therefore resolves the conflict between labor law and patent law in such a way that the participating parties, namely employer and employee, are satisfied as a general rule.(Keukenschrijver, 2016k; Kraßer and Ann, 2016, §21 Rdn. 52)

Crowdsourcing can cause a considerable effort and high costs for the organization, which initiated the crowdsourcing project. The organization maintains the facilities to manage the crowd. In particular, an internet platform is used for this purpose. In addition, the crowd is given the other requirements for the inventive activity, such as background knowledge.(Geschka and Meitinger, 2016)

It can be understood that the organization wants to obtain the resultant invention. However, according to §6 sentence 1 PatG, the patent law defines something different. Therefore, several attempts are being made to transfer the ownership of the invention to the organization despite the patent law. Often, the attempt is made to ensure a transfer of ownership from the inventor to the company by means of General Terms and Conditions (GTC). GTCs are regulations that apply to the same or similar agreements in the same way.(Geschka and Meitinger, 2016, pp. 30–31)

For the application of GTCs, §305c(1) BGB (surprising clause) is particularly relevant. Nowadays, it is self-evident that an intellectual creation induces ownership of this creation. The patent law is based on this finding. GTCs, which contradict this finding because the inventor loses ownership of the invention without adequate compensation, are due to §305c(1) BGB legally not valid. Further, pursuant to §307 BGB the basic principles of a law must not be hurt by GTCs. The inventor's principle is an essential part of the patent law, wherein it means, that an invention is the property of the inventor. Ownership of a thing means that the thing has a value, which can be particularly financially quantified. If, therefore, the property is transferred without adequate compensation, a violation of §305c(1) BGB and §307 BGB has occurred. Therefore, GTCs providing for a transfer of an invention without appropriate compensation may not be legally in force. The §§305c(1) and 307 BGB are often violated in GTCs of crowdsourcing projects.(Meitinger, 2016, pp. 534–535)

Another possibility of transfer of property is the transfer in advance. Such an agreement is subject to strict conditions. In particular, the object to be transferred must be precisely defined in its properties in advance. This is intended to ensure that the agreement will be applied to the right subject matter.(BGH, 1955, p. 289; Kraßer and Ann, 2016, §19 Rdn. 14) However, for the same reason, a transfer in advance is not suitable for the inventive result of a crowdsourcing project. It is just something not yet known at the beginning. The characteristics of this result can therefore not be determined in advance.

A third possibility would be that the organization enforces at least a joint use in accordance with §242 BGB. However, the legal hurdles are high for this approach. It would have to be an unfair disadvantage to exclude the organization from the use, for example because the organization contributed an overwhelming part for the creation of the invention. For this reason, the principle of "good faith" according to §242 BGB will typically not be relevant.(Bartenbach and Volz, 2012, §1 Rdn. 26; Meitinger, 2016, p. 535)

Otherwise, there is only the possibility to acquire the invention by agreement according to civil code. However, in this case, the inventor is not forced to transfer the invention to the organization. There is therefore a risk that the organization will not receive the invention.

It is therefore not ensured that the organization will get the crowdsourcing's result. Therefore, it was proposed to set up a law analogous to the GEIA which assigns the right to the invention, which results from the crowdsourcing, to the

organization. The inventive member of the OI innovation project should get a financial compensation.(Meitinger, 2016, pp. 539–540)

The GEIA will be regarded majorly as positive for the development of technology and therefore for the welfare of the German economy. It is also seen positive that the risks and the costs of the granting procedure are borne by the employer, who can afford it much easier than a single inventor.(Harhoff and Hoisl, 2007) On the other hand, there is criticism to GEIA. It is perceived as disadvantageous that GEIA causes an administrative burden.(Meier, 1998, pp. 779–780; Bartenbach and Volz, 2008, p. 18)

The introduction of the amendment to the GEIA on 31 July 2009 led to a reduction in administrative workload. For example, the legal fiction of claiming the employee's invention under §6(2) GEIA led to a substantial decrease of the administrative burden.(Bartenbach and Volz, 2009; Bundesanzeiger, 2009, pp. 2526–2528)

12.4 OI AND PROHIBITION RIGHTS

The publication of patent applications was determined by the Act amending the Patent Law of September 4, 1967.(Häußer and Goebel, 1990, p. 723) Due to §32(2) sentence 1 PatG in conjunction with §31(2) No. 2 PatG a patent application is published, which serves to inform the public early about emerging patents in order to avoid uneconomical double developments.(Schäfers, 2015a Rdn. 23)

However, it is also determined that a patent application will not be published immediately after filing with the patent office. There is a period of 18 months between the filing of a patent application and the first publication of the patent application.(Keukenschrijver, 2016h Rdn. 53; Rudloff-Schäffer, 2017a Rdn. 31)

The 18 months period due to §31(2) No. 2 PatG has already been heavily attacked in the scientific literature because of its unjustified preference for the “same” applicant. In this case, an applicant of a first patent application who files a similar patent application within the 18 months period is given preference over the public or other applicants on the basis of §4 sentence 2 PatG.(Meitinger, 2017a, p. 304)

That a patent application is only published after 18 months is justified by the fact that a patent application is an incomplete intellectual property right. With a patent application, there is no exclusion right. The use of a patent application by

a third party results in a compensation claim only. The lawmaker therefore wanted to shorten the period of free access to the patent application between its filing and the granting by inserting the 18 months period of secrecy.(Kraßer and Ann, 2016, §23 Rdn. 216-220)

The argument of the unsheltered patent application cannot convince as a utility model can be branched off from a patent application pursuant to §5(1) sentence 1 GebrMG at any time. An utility model is an intellectual property right that constitutes a right of prohibition of any use, except as methods, of the respective invention.(Meitinger, 2017a, p. 304)

Another argument is that the applicant should have a possibility to withdraw his application without leaving a legal right which might prevent him from submitting a similar patent application.(Rudloff-Schäffer, 2017a Rdn. 6)

However, the problem that current patent applications cannot be searched because of the blind spot of 18 months should be considered. This is particularly problematic for OI as crowdsourcing, since a test for novelty is not possible for this time period. Therefore, the abolition of the 18 months period due to §31(2) No. 2 PatG would be beneficial in order to clarify whether a third party prohibition right is relevant.(Meitinger, 2017a, p. 305)

12.5 OI AND UNLAWFUL REMOVAL

The first-to-invent concept states that the owner of an invention is the person who invented it as the first. In contrast to this, the first-to-file concept means that the invention belongs to the first to submit it to a patent office.(Nicolai, 1972) In Germany and Europe the first-to-file principle is valid.(Keukenschrijver, 2016l Rdn. 55) Only on September 16, 2012 after the Leahy-Smith America Invents Act came into effect the US patent system changed from the first-to-invent to the first-to-file concept.(AIPPLA, 2018)

A first-to-invent concept would have principally the advantage that no one can steal the idea. Filing of an invention before the inventor submits his patent application would be without effect. Especially if a large number of people are involved in an innovation process, there is a risk that the invention will be filed by a third party before it has been protected by a patent or patent application. This risk would not exist with a first-to-invent concept. For this reason, this concept would be advantageous for OI. The problem with the first-to-invent

approach is to prove the right origin. There can be legal uncertainty.(Nicolai, 1972)

12.6 ANSWER TO THE ELEVENTH RESEARCH QUESTION

In particular, the following improvements have been proposed:

- **A grace period would at least alleviate the problem of novelty and inventive activity due to patent law.**
- **A possibility to accept an organization at least as co-inventor of a patent would alleviate the problem with ownership of an invention.**
- **A further legal improvement would be a special law for OI, especially for crowdsourcing. Such a law would solve the problem of ownership of the invention for the organization.**
- **In order to improve the possibilities to search for patent applications the 18 months period of secrecy due to §32(1) sentence 1 in conjunction with §33 PatG should be abolished.**

13 MISCELLANEOUS APPROACHES

Further proposals will be discussed to improve the effectiveness of OI. The proposal to abolish patent law is mentioned. Further, it will be discussed whether a change of the case law is desirable. It will be also described how smart contracts can be used to establish an alternative legal system that could be used instead of patent law.

13.1 TWELFTH RESEARCH QUESTION

Various possibilities are discussed which are not aimed at improving patent law, but rather go alternative ways.

Twelfth research question

What other possibilities exist to amend the situation for OI with regard to patent law?

13.2 ABOLITION OF PATENT LAW

With regard to the incentive theory of patent law, a positive influence of patent law on the innovation activity is assumed. For this reason, patent law is supposed to promote the economy of a country. The incentive theory states that inventors are incited to innovation by the prospect of a patent.(Keukenschrijver, 2016q Rdn. 68)

The statement that patent law has a positive effect on a country's economy is controversial.(Encaoua and Hollander, 2002, p. 63; Shapiro, 2002, p. 70) Patent law is criticized fundamentally by several scholars.(Burk and Lemley, 2009, p. 3; Hrdy, 2012, pp. 80–81) But, there is rather a kind of fatalism towards the status quo, which consists in the argument that if there were no patent law, no patent law should be introduced and since a patent law already exists, this patent law should not be abolished.(Machlup, 1958, p. 80)

On the other hand, it is recommended to weaken or even abolish patent law. Studies have shown that strengthening patent law weakens innovation activity. Therefore, it is assumed, that there is no positive influence of patent law on the economy of a state.(Mansfield, 1986, p. 180; Chu, 2009, p. 75; Lerner, 2009, p. 347)

It was attempted to demonstrate that the patent system is detrimental because patents were not needed for using the technology described in the patents but as a „legal assurance“. Therefore, patent portfolios are bought, which drains out the budget for real investments in senseless and useless patents. The result is an economic malfunction.(Boyle, 2006, p. 64)

There is even a movement to erase the property based on patents.(Boldrin and Levine, 2002) These people are searching for ways to replace the property, which is guaranteed by patent law.(Maggiolino and LillaMontagnani, 2011)

It can be more advantageous for the participants of a market to allow free access to the invention in order to cover a whole market.(West and Gallagher, 2006, p. 325) Encaoua et al. explain, that a market could flourish, if there are no patents. In this case, market participants can develop products, based on innovations from other competitors. This would result in attractive products for customers. The attractive products would attract a huge amount of additional customers, which would lead to profits for all the firms in this industrial sector. On the other hand, patents can block the development of markets, because there is no possibility for attractive follow-on products.(Encaoua *et al.*, 2006) It is therefore assumed that the abolition of patents would be beneficial.

On the other hand, there are industries which would suffer substantially by an abolition of patent law. Pharmaceutical firms develop medicines, the costs of which can be immense. It is assumed that there would be no firm developing drugs without the possibility of getting patent protection.(Oehlrich, 2006, p. 18) At least, with reference to the pharmaceutical industry, the abolition of patent law does not appear to be useful.

13.3 CHANGE OF JURISPRUDENCE

To heal the controversy of OI and patent law it was recommended to the courts to be reluctant concerning the enforcement of legal rights such as patents. This reluctance should shelter OI and Open Source movements. A new jurisprudence should take increased appreciation for OI networks.(Boyle, 2006, p. 64)

This recommendation is based on the assumption that an OI network is fundamentally positive and therefore has to be treated with care. Indeed, there are open innovation communities with an altruistic orientation.(Schultz and Urban, 2012, pp. 21–26, 37) However, the assumption can be wrong. OI can be used to establish an economic monopoly.(West and Gallagher, 2006, p. 325) By giving away tools or products, a market can be "prepared", wherein in a second

step complements to the tools will be sold. This can lead to predominance in the respective market. The complements may be protected by patents. In this case, there is no altruistic OI network.

13.4 PATENT LAW AND SMART CONTRACTS

Smart contracts are self-executing contracts based on the blockchain technology. Therefore, smart contracts can execute agreements between several parties autonomously. (Laurence, 2017, p. 30; Morabito, 2017, p. 45; Chahbaz, 2018, p. 19)

Alternatively, smart contracts could also implement legal regulations. This would result in smart contracts, which would ensure that a law will be executed accurately. In particular, it can be ensured that deadlines of the law concerned are respected. The user can, for example, do without a lawyer. It has been described that patent law can be implemented as a smart contract. Further, the corresponding patent office can be restricted to the substantial examination of the invention to be protected. The smart contract itself checks the formal requirements of the patent law. (Meitinger, 2017f)

There is a possibility, that smart contracts can solve the conflict between OI and patent law. The main problems arising from the relationship between OI and patent law are as follows:

- mention of the inventor because of problems with the identification of the inventors,
- property in the invention, because the organization needs to possess the invention instead of the inventors,
- novelty and inventiveness must be doubted, if the invention comes from outside because of the external step of the OI innovation process,
- prohibition rights and
- rights because of unlawful removal.

The novelty and the inventive activity of an invention could be checked by means of a software routine as part of a corresponding smart contract. Every new contribution during the OI innovation project from outside the organization should be checked, whether it is indeed new and inventive from the viewpoint of patent law. This could be done by a search for prior art.

In addition, the smart contract could be dedicated to the identification of the inventors. The smart contract concerned could automatically determine which innovative contribution originates from which inventor. Further, the smart contract could compare the individual contributions in order to separate the inventive contributions from the non-inventive contributions. Furthermore, the smart contract could determine whether the inventor is an employee to carry out appropriate regulations of GEIA. The problems according to prohibition rights and the legal instrument of unlawful removal could be solved in a similar way.

It was shown that the definition of property due to patent law is not always suitable for OI. Smart contracts can provide the possibility to create a legal system, which can be defined by the parties involved. Therefore, smart contracts could provide to create an own legal system, which is more appropriate to foster an OI project. Especially the assignment of the property in the invention, which may deviate from patent law, could be made by a regulation of the smart contract.

13.5 ANSWER TO THE TWELFTH RESEARCH QUESTION

The following options have been discussed to facilitate the legal situation for OI:

- **abolition of patent law,**
- **change of jurisprudence and**
- **smart contracts to manage OI innovation processes.**

14 RECOMMENDATIONS FOR USERS OF OI

The thesis is concerned about the relationship between patent law and OI and how to change the patent law to fit better to OI. It is also useful to get recommendations for users of OI to adapt in a better way to the currently valid patent law. As a result, there are recommendations for users of OI in the light of the patent law.

The results up to now have shown that the innovation methods of CI and firm-to-firm OI have no adverse consequences from the point of view of patent law. It is therefore not necessary to make recommendations for these innovation methods.

It looks different with the OI with-an-external-inventor and the firm-to-firm OI with-an-external-inventor innovation methods. These methods can pose difficulties from the point of view of patent law. The recommendations presented here are therefore directed especially at users of these innovation methods.

14.1 THIRTEENTH RESEARCH QUESTION

The thirteenth research question asks what recommendations result from the findings of the thesis for users of OI.

Thirteenth research question

Which recommendations for users of OI make sense from the standpoint of the patent law?

14.2 OI AND PATENTABILITY

It was worked out that the two criteria of patentability of an invention, novelty (Keukenschrijver, 2016g; Moufang, 2017b) and inventive activity (Keukenschrijver, 2016j; Moufang, 2017g), can be infringed by an OI innovation process. For this reason, recommendations are provided which can preserve these criteria of patent law.

14.2.1 Novelty

The novelty criterion must be respected if a patentable invention is to be obtained from an OI innovation process. Novelty is infringed if the invention becomes publicly available. (Kraßer and Ann, 2016, §16 Rdn. 8)

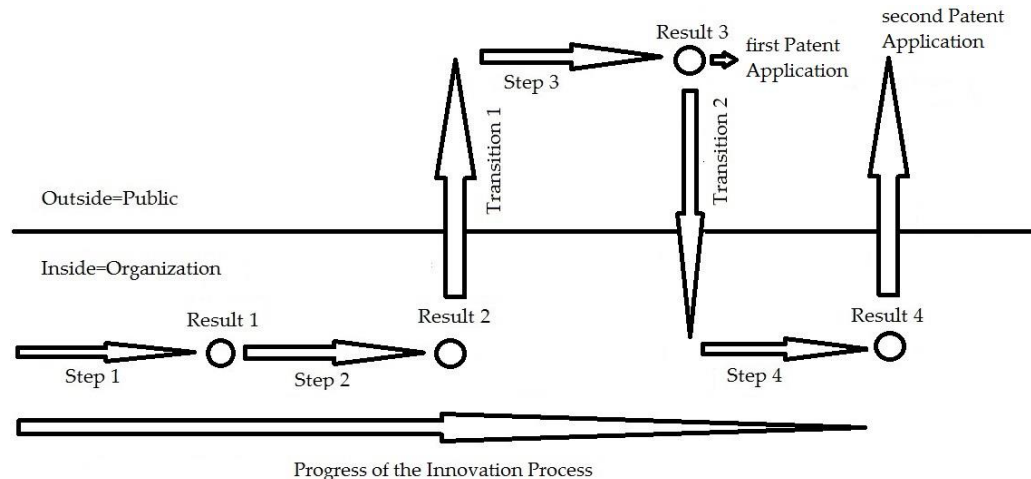


Figure 55: Early filing of result 3

Early filing of the result 3 of step 3

The filing date under §35(1) PatG and article 80 EPC of the filed invention is decisive for the assessment of novelty. (Keukenschrijver, 2016i Rdn. 3; Kraßer and Ann, 2016, §25 Rdn. 1-14; Teschemacher, 2016a; Moufang, 2017d Rdn. 10-15) Documents that only become available to the public on or after this date are not relevant for the evaluation of the novelty.

A recommendation would therefore be to file the result 3 of step 3 as a first patent application immediately after completion of step 3. After the end of step 4, a second patent application could be filed which could claim the priority of the first patent application. However, because of §40(1) PatG only a time period of 12 months may lie between the first and the second patent application. (Kraßer and Ann, 2016, §22 Rdn. 58; Tochtermann, 2016; Moufang, 2017h) With this proceeding, the critical step 3 would be protected by an early patent application, whereby the novelty of the entire patent application could be preserved.

Information for those involved in the innovation process

It can be assumed that not everyone involved in an innovation process is aware of the criteria of patentability under patent law. It may therefore make sense to

train the participants of the OI innovation project in such a way that unnecessary publications of the invention will be prevented.(Geschka and Meitinger, 2016)

Non-disclosure agreement

If a technical product or method is developed by several R&D cooperation partners, it can be assumed that it is in their common interest to keep the invention secret.(EPO, 1994b, 1996c) Therefore, the invention of a firm-to-firm OI is novel due to a non-disclosure agreement. The same is proposed for OI innovation methods with external inventors. It is therefore advisable to ensure that a non-disclosure agreement is in force between the parties involved in an innovation process, because a non-disclosure agreement preserves the novelty of an invention.(EPO, 1994c)

14.2.2 Inventive activity

The suggestions for fulfilling the novelty criterion can also be used with respect to the criterion of inventive step.

14.3 OI AND INVENTORSHIP

Inventorship due to patent law results in the problems of mentioning the inventor and property in the invention.

14.3.1 Mention the inventor

According to the patent law it is necessary that the inventors will be mentioned.(Teschmacher, 2016b; Moufang, 2017f) It is proposed to record all contributions of the members of the innovation process. This would make mentioning the inventors possible. Besides, it would be possible to collect evidence for possible trials. There could be legal proceedings because members of the innovation process are not content with the evaluation of their contribution to the invention.(Geschka and Meitinger, 2016, pp. 31–32)

14.3.2 Property in the invention

The property in the invention is an essential problem which arises because of the patent law. It has been described that there are presumably no ways to transfer ownership of an invention in advance. Also, one should not rely on the fact that General Terms and Conditions (GTCs) ensure a desired regulation of

the legal situation.(Meitinger, 2016) Employees as inventors are an exception to this rule, whose inventions can be transferred to the employers due to GEIA.(Keukenschrijver, 2016k; Kraßer and Ann, 2016, §21 Rdn. 66-81)

It should therefore be ensured that, if there is no employment relationship between inventor and initiator of the OI innovation project, a legal transfer of the rights to the invention takes place after the creation of the invention.(Geschka and Meitinger, 2016, p. 33)

14.4 OI AND PROHIBITION RIGHTS

It may happen that the openness of the OI innovation process gives an impulse to a third party to develop an invention similar to the own innovation. In this case it is important to file a patent application for the own invention as early as possible. In this case §6 sentence 3 PatG and article 60(2) EPC are relevant, which state that the first applicant has the right to the invention.(Bremi and Stauder, 2016a Rdn. 16-18; Keukenschrijver, 2016l Rdn. 54-58; Moufang, 2017l Rdn. 25-27) It is therefore advisable to aim for the earliest possible filing date.(Keukenschrijver, 2016i Rdn. 3-4; Kraßer and Ann, 2016, §25 Rdn. 8; Moufang, 2017d Rdn. 11-12)

14.5 OI AND UNLAWFUL REMOVAL

If one is disadvantaged due to an unlawful withdrawal, an entitlement to transfer arises under §8 PatG and article 61 EPC with regard to the patent application or patent in question.(Bremi and Stauder, 2016b Rdn. 19; Keukenschrijver, 2016n Rdn. 10-11; Kraßer and Ann, 2016, §20 Rdn. 7; Moufang, 2017n Rdn. 15-17)

14.6 ANSWER TO THE THIRTEENTH RESEARCH QUESTION

Depending on the characteristics of an invention, several recommendations were developed for the users of OI.

With respect to the novelty and inventive activity:

- **early filing of the invention,**
- **training of the participants of the innovation process and**
- **using a non-disclosure agreement.**

With respect to inventorship:

- **mention of the inventors: recording of the origin of every single contribution of the participants of the innovation project and**
- **property in the invention: agreement with the inventors for legal transfer of the invention.**

15 SUMMARY

The results of the individual chapters are summarized below, starting with chapter 2. The first chapter is the introduction. Finally, the main research question is answered.

Chapter 2: Limitations and Definitions

Definitions for CI and OI were developed from which the variants of the innovation methods were derived.

Definitions of CI and OI:

Closed Innovation (CI)

CI is an innovation method for creating an innovation for an organization, wherein only internal inventors and only this organization is involved in the innovation method.

Open Innovation (OI)

OI is an innovation method for creating an innovation for an organization, wherein at least one step of the innovation method is outside this organization.

Four variants of innovation methods were derived from the definitions of OI and CI, that have the following characteristics:

Closed Innovation (CI)

One organization and internal inventors

Variant 1 of Open Innovation (OI with-an-external-inventor)

One organization and at least one external inventor

Variant 2 of Open Innovation (firm-to-firm OI (Hagedoorn and Zobel, 2015, p. 1050))

Two or more organizations and internal inventors

Variant 3 of Open Innovation (firm-to-firm OI with-an-external-inventor)

Two or more organizations and at least one external inventor

Inventors are those participants in an innovation process who make a creative contribution in terms of patent law to the resulting innovation.

Chapter 3: State of the Scientific Research

Evaluation of the state of scientific research has shown that there are very few studies on the interaction between patent law and OI on the low-level of concrete provisions of the patent law.

Chapter 4: Coexistence of OI and Patent Law

In the scientific community, it has been argued that patent law and OI are contradictory concepts. It was stated that patent law would hinder or even prevent OI. Therefore, it was concluded that patent law should be abolished in order to fully exploit the benefits of the OI concept.(von Hippel and von Krogh, 2006; Wilson, 2009; Baldwin and von Hippel, 2011)

Many interfaces between patent law and OI have been found to refute these conclusions. Instead, in some areas patent law even helps to implement the OI concept.(Murray and Stern, 2007; de Jong *et al.*, 2008, pp. 39–40; Hagedoorn and Zobel, 2015) At least, it can be stated that patent law and OI are not fundamentally mutually exclusive.

Chapter 5: Touchpoints between OI and Patent Law

It has been pointed out that one link between patent law and an OI project is the interface between invention and innovation. The invention is assigned to the subject area of patent law and innovation is assigned to the subject area of OI.(Drucker, 1986, p. 62; Keukenschrijver, 2016b Rdn. 6-10; Moufang, 2017a Rdn. 15)

An innovation can be created by an OI project. If this innovation fulfils the requirements of an invention, patent law is relevant. In this case, it can be checked whether the innovation of the OI project can lead to a patent.(Kraßer and Ann, 2016, §25)

Furthermore, there are effects on the innovation by the innovation method used such as OI through the prohibition rights of patent law and the legal instrument of unlawful extraction.(Keukenschrijver, 2016o, 2016c, 2016n; Kraßer and Ann, 2016, §§31 and 32; Moufang, 2017n; Rinken, 2017f, 2017a)

Therefore there are three points of contact between patent law and OI, namely because OI can result in inventions in terms of patent law, because of the prohibition rights of patent law and because of the legal instrument of unlawful removal.

Chapter 6: Properties of an Invention

The characteristics of an invention due to patent law were determined, wherein those characteristics, which have to be fulfilled that there is an invention at all, were disregarded. These characteristics must be fulfilled anyway, so that the patent law is relevant at all.

An invention according to patent law has the following characteristics:

- being in the right language (Schäfers, 2015e; Stauder, 2016a; Moufang, 2017e; Visser, 2017, pp. 18–25),
- feasibility (Moufang, 2017c Rdn. 349-362),
- susceptible of industrial applicability (Moufang, 2017j; Visser, 2017, pp. 126–127),
- being a state secret (Schäfers, 2015i),
- mentioning the inventor (Teschemacher, 2016b; Moufang, 2017f),
- property in the invention (Keukenschrijver, 2016l; Moufang, 2017l),
- novelty (Keukenschrijver, 2016g; Moufang, 2017b) and
- inventive activity (Keukenschrijver, 2016j; Moufang, 2017g).

Chapter 7: Relevant Properties of an Invention

It was found that four properties of an invention are indeed influenced by the innovation method chosen, namely mention of the inventor, property in the invention, novelty and inventive activity. Therefore, these properties have an effect on the way patent law works with respect to the innovation method chosen.

The effects of these properties are as follows:

- Patent law requires that the inventors will be mentioned. (Teschemacher, 2016b; Moufang, 2017f) Therefore, the inventors must be identified.
- In addition, the invention leads directly to a claim to ownership of the invention for the inventor. (Keukenschrijver, 2016l; Moufang, 2017l) Such a claim can, for example, stand in opposition to the wish of an initiator of a crowdsourcing project. Naturally, the initiator strives for ownership of an resulting invention of the crowdsourcing project. (Geschka and Meitinger, 2016)
- Due to the open character of OI, there is a danger that an invention will become known and is therefore no longer new and inventive. (Keukenschrijver, 2016g, 2016j, Moufang, 2017b, 2017g) In this

case, it is not possible to patent the invention.(Kraßer and Ann, 2016, §25)

The following table 44 shows all possible properties of an invention, namely those which are a requirement for being an invention at all, all possible properties in terms of patent law and those properties, which have an effect on the way patent law is working depending on the innovation method chosen.

Table 44: Properties of an invention

Properties of an invention	Requirement of an Invention	directing Patent Law	influenced by the type of Innovation Method
technical Nature	yes	no	no
Teaching	yes	no	no
created by a Human Being	yes	no	no
Inventorship	no	yes	yes
Novelty	no	yes	yes
inventive Activity	no	yes	yes
industrial Applicability	no	yes	no
Feasibility	no	yes	no
being in the right Language	no	yes	no
being a State Secrecy	no	yes	no

Table 44 shows all properties of an invention. In the first column of the table (requirement of an invention), the properties that are a prerequisite for an invention are determined as "yes". These properties are used in section 5.3.3 of chapter 5 to determine whether an innovation by OI can be an invention under patent law at all.

The second column (directing patent law) of the table 44 lists the characteristics of an invention with "yes" that influence the way patent law is working. For example, only a new and inventive invention can become a patent. These properties are determined in chapter 6. Inventorship comprises the characteristics of mention of the inventor and property of the invention.

The third column determines those properties of an invention which not only control patent law but are additionally influenced by the type of innovation method chosen. These properties are determined in chapter 7.

Chapter 8: Groups of Innovation Methods

Four variants of innovation methods before the background of patent law were found, namely:

- Closed innovation,
- variant 1 of OI: OI with-an-external-inventor,
- variant 2 of OI: firm-to-firm OI and
- variant 3 of OI: firm-to-firm OI with-an-external-inventor.

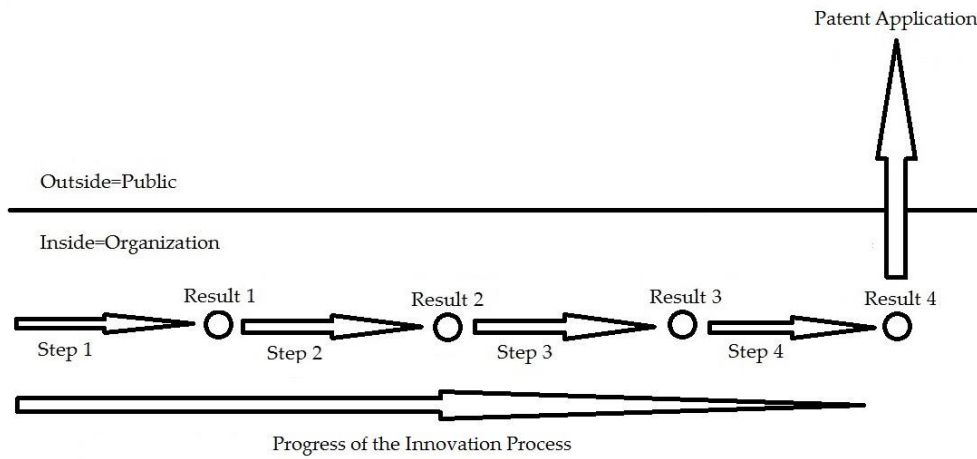


Figure 56: Closed Innovation

Closed Innovation (CI) is characterized by the fact that all steps of the innovation process are within one organization.

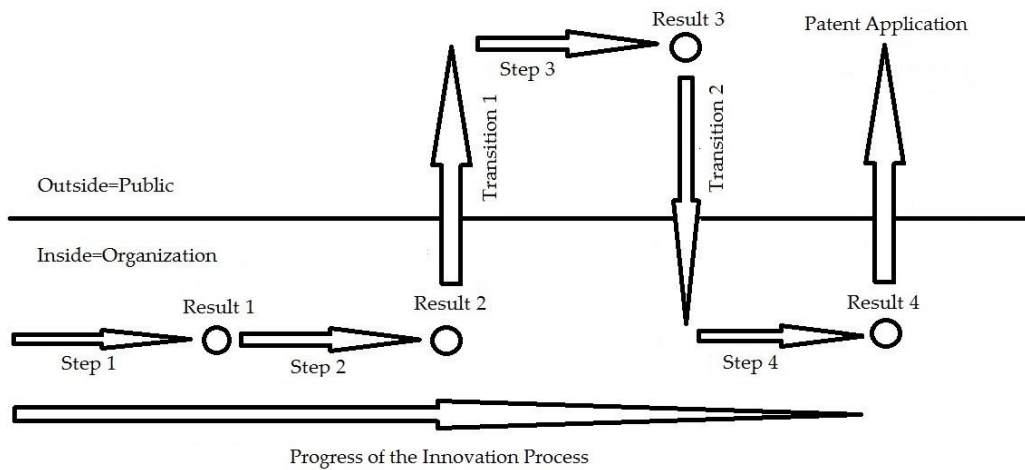


Figure 57: Variant 1 of OI

An OI with-an-external-inventor (variant 1 of OI) is an innovation method that is characterized by the participation of at least one external inventor. This inventor is not a member of the organization.

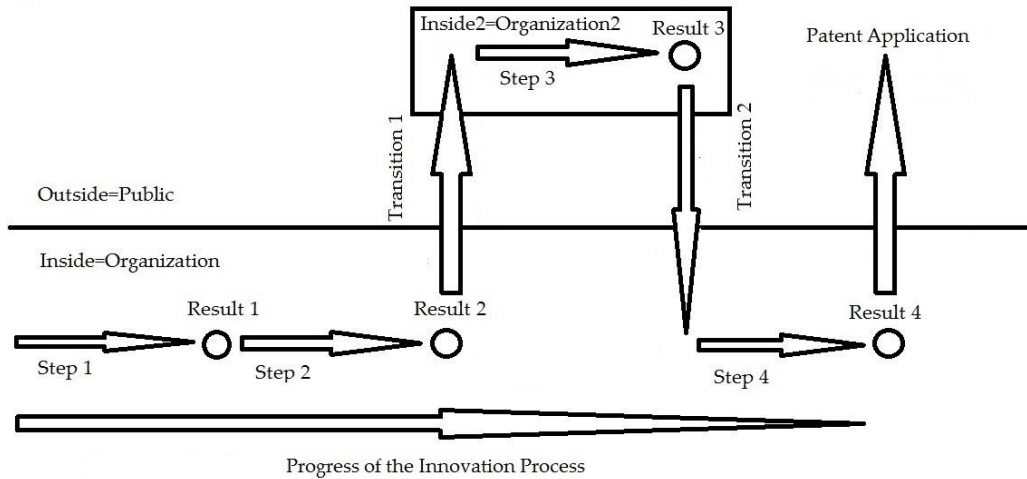


Figure 58: Variant 2 of OI

The variant 2 of OI is called a firm-to-firm OI (Hagedoorn and Zobel, 2015, p. 1050) which is an OI innovation method wherein at least two organizations, such as companies or universities, are involved in the development of the innovation. Further, all the inventors are internal inventors, which means that every inventor belongs to one of the companies involved in the innovation process.

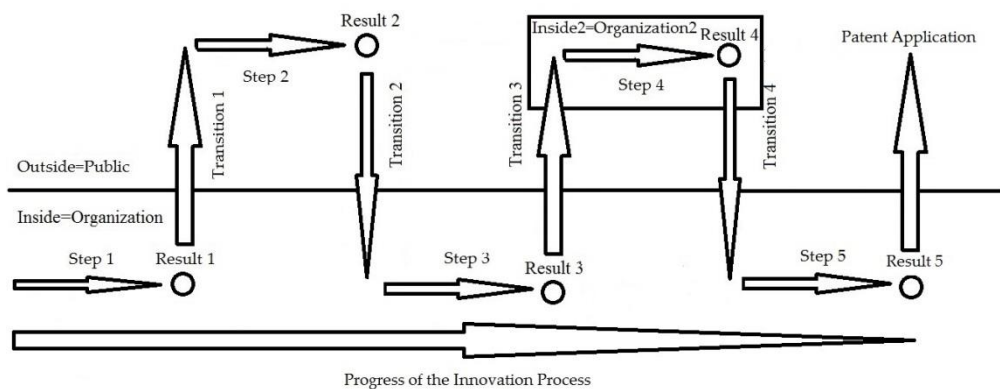


Figure 59: Variant 3 of OI

The variant 3 of OI is called a firm-to-firm OI with-an-external-inventor. This variant is characterized by the fact that it is a sequence of the variants 1 and 2 of

OI. It does not matter which part of the sequence starts first and which part is succeeding.

A grouping of the innovation methods has been carried out. From the viewpoint of patent law, CI and firm-to-firm OI constitute a first group and OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor form a second group:

- Group 1 (not critical with regard to patent law):
 - CI and
 - firm-to-firm OI
- Group 2 (critical with regard to patent law):
 - OI with-an-external-inventor and
 - firm-to-firm OI with-an-external-inventor.

CI and firm-to-firm OI are to be assessed as not critical before the background of patent law. On the other hand, OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor are critical with regard to all four relevant properties of an invention. Therefore, the characteristic of "having at least one external inventor" means that an innovation method must be regarded as critical.

If you add to CI an external inventor you get OI with-an-external-inventor. If you add to firm-to-firm OI an external inventor, you arrive at firm-to-firm OI with-an-external-inventor. CI and OI with-an-external-inventor as well as firm-to-firm OI and firm-to-firm OI with-an-external-inventor therefore represent contradictory pairings from the point of view of patent law, whereby the members of group 1 are uncritical and the innovation methods of group 2 are to be regarded as critical from the viewpoint of patent law.

Chapter 9: OI and Prohibition Rights

The variants of innovation methods have been categorised on the basis of the possibilities of having the innovations of the innovation methods granted as patents. This resulted in two groups, namely a group 1, which comprises CI and firm-to-firm OI, and as a second group OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor.

A further effect on the innovation methods and the resultant innovations may come from the prohibition rights under patent law. The prohibition rights enable a patent holder to prohibit the use of a protected invention. (Keukenschrijver, 2016o, 2016c, Rincken, 2017f, 2017a)

The question arose whether a different grouping of the innovation methods results in the light of the prohibition rights due to patent law. However, it was found that the grouping of the innovation methods already determined is also relevant before the background of the prohibition rights.

Chapter 10: OI and Unlawful Removal

The grouping of innovation methods found was examined in the light of the legal instrument of unlawful removal due to patent law. An invention is deemed to have been withdrawn unlawfully if a person who is not entitled files a patent application for this invention with the patent office.(Keukenschrijver, 2016n; Moufang, 2017n)

It was found that the same grouping as in the previous two chapters is valid before the background of the legal instrument of unlawful removal.

Chapter 11: Empirical Studies

It has been found that CI is dominant in innovations, which result in patent applications. Therefore the importance of OI for patents was questioned.(Meitinger, 2017b, 2017c) The empirical studies of the thesis have confirmed with a more comprehensive examination, that indeed OI, in comparison to CI, plays little role in patent applications. Therefore, at the moment it can be stated, that "Thus, there will likely remain a certain level of 'closed-ness' ...".(Keupp and Gassmann, 2009, p. 338)

The empirical studies show that there are very few patent applications due to firm-to-firm OI, although firm-to-firm OI is compatible with patent law. However, it must be borne in mind that firm-to-firm OIs can be critical under antitrust law.(Besen and Slobodenjuk, 2011, pp. 300–301; Fuchs, 2012 Rdn. 2-9) It can therefore be assumed that at least some firm-to-firm OI innovation projects might be prevented due to concerns because of antitrust law.

On the other hand, innovation methods with an external inventor lead to fewer patent applications compared to the corresponding innovation methods without an external inventor. This result was attributed to the fact that the corresponding innovations are not compatible with patent law. In principle, it would be conceivable that it is not the existence of the external inventor that is responsible for the filing or waiving of a patent application, but in particular the specificity of the organization concerned. For this reason, organizations carrying out innovation methods with external inventors were roughly compared with those organizations carrying out innovation methods without external

inventors. No obvious differences in criteria such as company size, industrial sector, etc. were found.

Summarizing the empirical studies, CI is dominant with respect to OI with-an-external-inventor and firm-to-firm OI dominates in comparison to firm-to-firm OI with-an-external-inventor. Further, the group 1 is dominant compared to group 2. Therefore, the theoretical findings of the thesis could not be falsified by the empirical studies.

Chapter 12: Proposals to amend Patent Law

Several suggestions have been developed in this thesis in order to better adapt patent law to OI. A change in the inventor's principle has been proposed to allow organizations to acquire ownership of an invention that they have initiated. Such an amendment is particularly advantageous with regard to OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor, for example as crowdsourcing.(Meitinger, 2017d)

A comparison was made between the employer-employee relationship and the relationship of a crowdsourcer to a crowd member. It has been found that there are similarities, suggesting that a similar law to the GEIA for the needs of crowdsourcing should be drawn up.(Meitinger, 2016) Such a special law would be also an adequate response by the legislature to the development of the labor market, with ever more flexible forms of work.(Deinert, 2014; Uffmann, 2016)

The 18 months period of secrecy due to §32(2) sentence 1 PatG in conjunction with §31(2) No. 2 PatG prevents the search for current state-of-the-art documents.(Rudloff-Schäffer, 2017a Rdn. 33) This increases legal uncertainty about the patentability of inventions. In particular, inventions of OI projects are affected by this, as their open character increases the likelihood that similar patent applications will be filed. It was proposed to abolish this time period in order to be able to search the relevant prior art as early as possible. This would make it easier to ascertain whether an invention by an external inventor is patentable or whether it infringes third party intellectual property rights.(Meitinger, 2017a)

Chapter 13: Miscellaneous Approaches

There is an incentive theory as justification for patent law that says that the possibility of patenting an invention would spur technological development, which promotes the economy of the country concerned.(Rogge and Melullis, 2015 Rdn. 3; Keukenschrijver, 2016q Rdn. 68) However, patent law is evaluated

by other scholars as disadvantageous because of macroeconomic concerns.(Mansfield, 1986, p. 180; Chu, 2009, p. 75; Lerner, 2009, p. 347) Therefore, patent law is seen controversial.(Encaoua and Hollander, 2002, p. 63; Shapiro, 2002, p. 70) The abolition of patent law was recommended.

Alternatively, it is recommended a case law which favors OI, as OI is generally considered to be worthy of protection.(Wiebe, 2004; Boyle, 2006) However, this cannot be taken across the board, as OI is also used to monopolize markets. This can be done by the introduction of products to the markets being available for free. This ensures a high market penetration, wherein complements of these products are not accessible for free. These complements are needed for full functionality and will be made accessible only after sale.(West and Gallagher, 2006, pp. 325–327) For this reason, the jurisprudence should not be based on the assumption of consistently positive OI projects.

A further possibility to improve harmonization of OI and patent law can result from the use of the technology of smart contracts. Smart contracts could manage innovations of OI projects in such a way, that their patentability is not infringed. Additionally an disadvantageous influence, which occurs through the prohibition rights of patent law or through the legal instrument of unlawful extraction could be prevented.(Meitinger, 2017f) In addition, a smart contract could design the ownership rights to an invention in such a way that they are more suitable for OI.

Chapter 14: Recommendations for Users of OI

Suggestions for OI users have been developed before the background of the current patent law. One suggestion is to document all contributions of the inventors with their date and origin. This makes it possible to meet the legal requirements of patent law after mention the inventors. In addition, it is recommended to enter into appropriate transfer agreements with each inventor so that ownership of the invention can be acquired.(Geschka and Meitinger, 2016, p. 33)

It is recommendable to file the resulting invention with a patent office as early as possible. In this case, an early filing date protects against third party patents.(Keukenschrijver, 2016i Rdn. 3-4; Kraßer and Ann, 2016, §25 Rdn. 6; Teschemacher, 2016a Rdn. 1; Moufang, 2017d Rdn. 11-15)

Main Research Question

The main research question is:

What is the relationship between patent law and OI because of the different properties of OI compared to CI with respect to the single provisions of patent law?

It was found that neither on a CI project nor on an OI project that is carried out by two or more organizations, wherein the inventors are members of the organizations, is an adverse effect because of patent law. If, on the other hand, an OI project is carried out with one or more external inventors, i.e. who are not members of one of the participating organizations, patent law has a disadvantageous effect. With such an OI project, patentability is endangered solely by the nature of the innovation method; in addition, legally problematic situations may arise due to inventorship under patent law. There are also problems with the prohibition rights of patent law and the legal instrument of unlawful removal.

Therefore, the main research question is answered as follows:

Answer to the main research question

From the viewpoint of patent law there are four different innovation methods:

- **Closed innovation,**
- **OI with-an-external-inventor,**
- **firm-to-firm OI and**
- **firm-to-firm OI with-an-external-inventor.**

From the impact of patent law the innovation methods can be grouped as follows:

- **Group 1**
Closed Innovation and firm-to-firm OI
- **Group 2**
OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor

Patent law has an adverse effect on the innovation methods of the group 2. There is no influence on the innovation methods of group 1. The innovation methods of group 2 differ from those of group 1 in that at least one external inventor is involved. The existence of an external inventor therefore means that the innovation method in question is not in line with patent law.

RESEARCH QUESTIONS AND ANSWERS

First research question

Which different variants of innovation methods can be distinguished?

Answer

There are four different variants of innovation methods:

Closed Innovation (CI)

One organization and internal inventors

Variant 1 of Open Innovation (OI with-an-external-inventor)

One organization and at least one external inventor

Variant 2 of Open Innovation (firm-to-firm OI)

Two or more organizations and internal inventors

Variant 3 of Open Innovation (firm-to-firm OI with-an-external-inventor)

Two or more organizations and at least one external inventor

Second research question

What can the current scientific research contribute to answering the main research question?

Answer

There is no comprehensive examination of OI in comparison to CI before the background of patent law on basis of the provisions of patent law. As a conclusion, there is a gap of the scientific research.

Third research question

Is there a fundamental conflict between OI and patent law?

Answer

The examples discussed falsify the assumption that OI and patent law are fundamentally incompatible. Therefore, there is no general controversy between OI and patent law. Patent law does not exclude OI and the other way round not either. But, there is not always a perfect harmony between both and patent law and OI do not fit properly in every possible situation.

Fourth research question

What are the touchpoints between OI and patent law?

Answer

As a result, there are three possible interactions between OI and patent law. On the one hand, OI can lead to innovations that result in inventions under patent law. On the other hand, effects of patent law on OI can result from the prohibition rights and the legal instrument of unlawful removal.

Fifth research question is as follows

Which are the properties of an invention due to patent law?

Answer

The object invention has the following properties:

- inventorship, comprising
 - mentioning the inventor,
 - property in the invention,
- novelty,
- inventive activity,
- susceptible of industrial applicability,
- feasibility,
- being in the right language and
- being a state secrecy.

Sixth research question is as follows

Which properties of an invention due to patent law behave differently depending on the selected innovation method?

Answer

The significant properties of an invention are:

- novelty,
- inventive activity,
- mentioning the inventor due to inventorship and
- property in the invention due to inventorship.

Seventh research question

Which are the groups of innovation methods from the standpoint of the properties of an invention due to the patent law?

Answer

From the standpoint of patent law, there are two groups of innovation methods:

- Group 1
Closed Innovation and firm-to-firm OI
- Group 2
OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor

In addition, two pairs of innovation methods could be identified, which represent opposites from a patent law perspective:

- CI versus OI with-an-external-inventor and
- firm-to-firm OI versus firm-to-firm OI with-an-external-inventor.

Further, the innovation methods of group 1 are in line with the patent law, whereas the innovation methods of group 2 are not in line with the patent law.

Eighth research question

Which are the groups of innovation methods from the standpoint of the prohibition rights of patent law?

Answer

The same grouping of innovation methods as mentioned above can be used. From the standpoint of the prohibition rights of patent law firm-to-firm OI and CI are similar and form a first group of innovation methods, whereas OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor form a second group.

Ninth research question

Which are the groups of innovation methods from the standpoint of the legal instrument of unlawful removal of patent law?

Answer

The same grouping of innovation methods as in the chapters 8 and 9 can be used. From the standpoint of the legal instrument of unlawful removal of patent law firm-to-firm OI and CI are similar and form a first

group of innovation methods, whereas OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor form a second group.

Tenth research question

Can the theoretical results be falsified by empirical studies? Particularly, how are the following questions answered by empirical studies?

- Are there more OI with-an-external-inventor patent applications than CI patent applications or vice versa?
- Are there more firm-to-firm OI with-an-external-inventor patent applications than firm-to-firm OI patent applications or vice versa?
- Are there more group 2 patent applications than group 1 patent applications or vice versa?

Answer

It can be stated that CI dominates in group 1 and OI with-an-external-inventor dominates in group 2. Further, there are significantly more CI patent applications than OI with-an-external-inventor patent applications. This means that CI results to the most of inventions for which patent applications are filed.

Further, innovation methods with an external inventor result in less patent applications than the corresponding innovation methods without external inventors. There are more patent applications due to CI than due to OI with-an-external-inventor. There are more patent applications due to firm-to-firm OI than due to firm-to-firm OI with-an-external-inventor. Finally, there are more patent applications because of group 1 innovation methods than because of group 2 innovation methods. Therefore, the empirical studies cannot falsify the findings of the theoretical part of the thesis.

Eleventh research question

Which amendments of patent law make sense from the standpoint of OI?

Answer

In particular, the following improvements have been proposed:

- A grace period would at least alleviate the problem of novelty and inventive activity due to patent law.

- A possibility to accept an organization at least as co-inventor of a patent would alleviate the problem with ownership of an invention.
- A further legal improvement would be a special law for OI, especially for crowdsourcing. Such a law would solve the problem of ownership of the invention for the organization.
- In order to improve the possibilities to search for patent applications the 18 months period of secrecy due to §32(1) sentence 1 in conjunction with §33 PatG should be abolished.

Twelfth research question

What other possibilities exist to amend the situation for OI with regard to patent law?

Answer

The following options have been discussed to facilitate the legal situation for OI:

- abolition of patent law,
- change of jurisprudence and
- smart contracts to manage OI innovation processes.

Thirteenth research question

Which recommendations for users of OI make sense from the standpoint of the patent law?

Answer

Depending on the characteristics of an invention, several recommendations were developed for the users of OI.

With respect to the novelty and inventive activity:

- early filing of the invention,
- training of the participants of the innovation process and
- using a non-disclosure agreement.

With respect to inventorship:

- mention of the inventors: recording of the origin of every single contribution of the participants of the innovation project and

- property in the invention: agreement with the inventors for legal transfer of the invention.

Main research question

What is the relationship between patent law and OI because of the different properties of OI compared to CI with respect to the single provisions of patent law?

Answer

From the viewpoint of patent law there are four different innovation methods:

- Closed innovation
- OI with-an-external-inventor
- firm-to-firm OI and
- firm-to-firm OI with-an-external-inventor.

From the impact of patent law the innovation methods can be grouped as follows:

- Group 1
Closed Innovation and firm-to-firm OI
- Group 2
OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor

Patent law has an adverse effect on the innovation methods of the group 2. There is no influence on the innovation methods of group 1. The innovation methods of group 2 differ from those of group 1 in that at least one external inventor is involved. The existence of an external inventor therefore means that the innovation method in question is not in line with patent law.

GLOSSARY

Closed Innovation (CI): CI is an innovation method for creating an innovation for an organization, wherein only internal inventors and only this organization is involved in the innovation method.

Crowdsourcing: Crowdsourcing as variant of OI is an innovation process for creating an innovation for an organization, wherein at least one step of the innovation process is conducted by a crowd outside the organization.

Firm-to-firm OI: Variant 2 of Open Innovation.

Firm-to-firm OI with-an-external-inventor: Variant 3 of Open Innovation.

Innovation: An innovation is the result of an innovation process, wherein the innovation can be a product, process, service or other kind of economical object, and which is with some regard new.

Invention: An invention is a technical teaching, which is the achievement of one or several human beings.

OI with-an-external-inventor: Variant 1 of Open Innovation.

Open Innovation (OI): OI is an innovation method for creating an innovation for an organization, wherein at least one step of the innovation method is outside this organization.

Variant 1 of OI: One organization and at least one external inventor. This variant is named as OI with-an-external-inventor.

Variant 2 of OI: Two or more organizations and internal inventors. This variant is named as firm-to-firm OI.

Variant 3 of OI: Two or more organizations and at least one external inventor. This variant is named as firm-to-firm OI with-an-external-inventor.

REFERENCES

- von Ahsen, A., Heesen, M. and Kuchenbuch, A. (2010) 'Grundlagen der Bewertung von Innovationen im Mittelstand', in Ahsen, V. (ed.) *Bewertung von Innovationen im Mittelstand*. Berlin/Heidelberg: Springer Verlag, pp. 1–38.
- AIPLA (2018) *AIPLA American Intellectual Property Law Association*. Available at: <http://www.aipla.org/advocacy/congress/aia/Pages/summary.aspx> (Accessed: 23 June 2018).
- Alexy, O., Criscuolo, P. and Salter, A. (2009) 'Does IP strategy have to cripple open innovation', *MIT Sloan Management Review*, 51(1), pp. 71–77.
- Ann, C. (2004) 'Die idealistische Wurzel des Schutzes geistiger Leistungen', *Gewerblicher Rechtsschutz und Urheberrecht Internationaler Teil*, pp. 597–603.
- Aoki, R. and Schiff, A. (2008) 'Promoting access to intellectual property: patent pools, copyright collectives, and clearinghouses', *R&D Management*, 38(2), pp. 189–204.
- Arrow, K. J. (1962) 'Economic welfare and the allocation of resources for invention', in *The Rate and Direction of inventive activity: Economic and Social Factors*, pp. 609–626.
- Asendorf, C. D. and Schmidt, C. (2015a) '§4 PatG Erfindung auf Grund erfinderischer Tätigkeit', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Asendorf, C. D. and Schmidt, C. (2015b) '§5 PatG Gewerblich anwendbare Erfindung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Ashley, K. D. and Rissland, E. L. (2003) 'Law, learning and representation', *Artificial Intelligence*, 150(1–2), pp. 17–58. doi: 10.1016/S0004-3702(03)00109-7.
- Axster, O. and Osterrieth, C. (2018) 'A. Allgemeiner Teil', in Pfaff, D. and Osterrieth, C. (eds) *Lizenzverträge - Formulkommentar*. 4th ed. Munich: C.H.Beck.
- Ayres, I. and Parchomovsky, G. (2007) 'Tradable patent rights: a new approach to innovation', *Faculty Scholarship*, 60(3), pp. 863–894.
- Azetsu, K. and Yamada, S. (2013) 'Package licenses in patent pools with basic and optional patents', *Modern Economy*, 4, pp. 10–19.
- Bacher, K. (2015) '§1 PatG Voraussetzungen der Erteilung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich:

C.H.Beck

Baldwin, C., Hienerth, C. and von Hippel, E. (2006) 'How user innovations become commercial products: A theoretical investigation and case study', *Research Policy*, 35(9), pp. 1291–1313.

Baldwin, C. and von Hippel, E. (2011) 'Modeling a paradigm shift: From producer innovation to user and open collaborative innovation', *Organization Science*, 22(6), pp. 1399–1417.

Barak, A. (2005) *Purposive Interpretation in Law*. Princeton: Princeton University Press.

Bartenbach, K. and Volz, F.-E. (2008) '50 Jahre Gesetz über Arbeitnehmererfindungen', *Gewerblicher Rechtsschutz und Urheberrecht*, (Beilage), pp. 1–22.

Bartenbach, K. and Volz, F.-E. (2009) 'Die Novelle des Gesetzes über Arbeitnehmererfindungen 2009', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 997–1007.

Bartenbach, K. and Volz, F.-E. (2012) *Arbeitnehmererfindungsgesetz. Kommentar zum Gesetz über Arbeitnehmererfindungen*. 5th ed. Köln: Carl Heymanns Verlag.

Baumol, W. J. and Blinder, A. S. (2011) *Microeconomics. principles and policy*. 12nd ed. Mason: South-Western Cengage Learning.

Bauschke, H.-J. (2016) 'Arbeitsrecht 4.0 - Eine kurze Bestandsaufnahme aus aktuellem Anlass', *öAT*, pp. 225–228.

Beck, B. (2008) *Volkswirtschaft verstehen*. 5th ed. Zürich: vdf Hochschulverlag.

Beck, B. (2011) *Mikroökonomie*. Zürich: vdf Hochschulverlag.

Beier, H. (1979) 'Die gemeinschaftliche Erfindung von Arbeitnehmern', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 669–672.

Bekkers, R., Duysters, G. and Verspagen, B. (2002) 'Intellectual property rights, strategic technology agreements and market structure The case of GSM', *Research Policy*, 31(7), pp. 1141–1161.

Belleflamme, P. (2006) 'Patents and incentives to innovate: some theoretical and empirical economic evidence', *Ethical Perspectives: Journal of the European Ethics Network*, 13(2), pp. 267–288.

Bench-Capon, T. and Sartor, G. (2003) 'A model of legal reasoning with cases incorporating theories and values', *Artificial Intelligence*, 150(1–2), pp. 97–143. doi: 10.1016/S0004-3702(03)00108-5.

Berchicci, L. (2013) 'Towards an open R&D system: Internal R&D investment,

external knowledge acquisition and innovative performance', *Research Policy*, 42(1), pp. 117–127.

Besen, M. and Slobodenjuk, D. (2011) 'Die neue Gruppenfreistellungsverordnung für Forschungs- und Entwicklungsvereinbarungen', *Gewerblicher Rechtsschutz und Urheberrecht*, 4, pp. 300–306.

BGH (1955) '16.11.1954 - I ZR 40/53', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 286–292.

BGH (1958) '21.03.1958 - I ZR 160/57 "Wettschein"', *Gewerblicher Rechtsschutz und Urheberrecht*, 12, pp. 602–603.

BGH (1962) '08.06.1962 - I ZR 9/61 "Blitzlichtgerät"', *Gewerblicher Rechtsschutz und Urheberrecht*, 10, pp. 518–522.

BGH (1963) '22.01.1963 - Ia ZR 60/63 "Stapelpresse"', *Gewerblicher Rechtsschutz und Urheberrecht*, 6, pp. 311–314.

BGH (1966a) '05.05.1966 - Ia ZR 110/64 "Spanplatten"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 558–561.

BGH (1966b) '25.11.1965 - Ia ZR 117/64 "Pfennigabsatz"', *Gewerblicher Rechtsschutz und Urheberrecht*, 9, pp. 484–488.

BGH (1969) '27.03.1969 - X ZB 15/67 "Rote Taube"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 672–676.

BGH (1977) '01.07.1976 - X ZB 10/74 "Kennungsscheibe"', *Gewerblicher Rechtsschutz und Urheberrecht*, 3, pp. 152–154.

BGH (1978a) '07.06.1977 - X ZB 20/74 "Prüfverfahren"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 102–105.

BGH (1978b) '13.12.1977 - X ZR 28/75 "Hydraulischer Kettenbandantrieb"', *Gewerblicher Rechtsschutz und Urheberrecht*, 5, pp. 297–300.

BGH (1979) '06. 03. 1979 - X ZR 60/77 "Widerrechtliche Entnahme eines Teils der Patentanmeldung - Spinnmaschine"', *Neue Juristische Wochenschrift*, 43, pp. 2210–2211.

BGH (1980) '13.05.1980 - X ZB 19/78 "Antiblockiersystem"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 849–852.

BGH (1986) '11.03.1986 - X ZR 65/85 "Flugkostenminimierung"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 531–535.

BGH (1993) '09.02.1993 - X ZB 7/92 "Preprint-Versendung"', *Gewerblicher*

Rechtsschutz und Urheberrecht, 5, pp. 466–469.

BGH (1996) '11.07.1995 - X ZR 99/92 "Klinische Versuche"', *Gewerblicher Rechtsschutz und Urheberrecht*, 2, pp. 109–121.

BGH (1997) '17.04.1997 - X ZR 68/94 "Patentrechtliches Versuchsprivileg – Klinische Versuche II"', *Neue Juristische Wochenschrift*, 46, pp. 3092–3096.

BGH (1999) '10.11.1998 - X ZR 137/94 "Öffentliche Zugänglichkeit einer Erfindung während Entwicklungs- und Erprobungsphase - Herzklappenprothese"', *Neue Juristische Wochenschrift*, 12, pp. 834–836.

BGH (2004) '16.09.2003 - X ZR 142/01 "Tatrichterliche Feststellungen zur Miterfindereigenschaft"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 50–52.

BGH (2005) '22.03.2005 - X ZR 152/03 "Gummielastische Masse II"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 663–665.

BGH (2009) '12.03.2009 - Xa ZR 86/06 "Mitberechtigung trotz Teilbarkeit der Patentanmeldung - Blendschutzbehang"', *Gewerblicher Rechtsschutz und Urheberrecht*, 7, pp. 657–659.

Bley, S. (2010) 'Innovationswettbewerb und Open Innovation', in Gundlach, C., Glanz, A., and Gutsche, J. (eds) *Die frühe Innovationsphase. Methoden und Strategien für die Vorentwicklung*. Düsseldorf: Symposium Publishing GmbH, pp. 299–325.

Blind, K., Edler, J., Frietsch, R. and Schmoch, U. (2006) 'Motives to patent: Empirical evidence from Germany', *Research Policy*, 35, pp. 655–672.

Blind, K. and Pohlmann, T. (2014) 'Patente und Standards: Offenlegung, Lizenzen, Patentstreitigkeiten und rechtspolitische Diskussionen', *Gewerblicher Rechtsschutz und Urheberrecht*, 116(8), pp. 713–719.

Blohm, I. (2013) *Open Innovation Communities. Absorptive Capacity und kollektive Ideenbewertung*. Munich.

Boettiger, S. and Burk, D. (2004) 'Open source patenting', *Journal of International Biotechnology Law*, 1(6), pp. 221–231.

Bogers, M. (2011) 'The open innovation paradox: knowledge sharing and protection in R&D collaborations', *European Journal of Innovation Management*, 14(1), pp. 93–117.

Boldrin, M. and Levine, D. (2002) 'The case against intellectual property', *American Economic Review*, 92(2), pp. 209–212.

Boldrin, M., Levine, D. K. and Nuvolari, A. (2005) 'Do patents encourage or hinder innovation? The case of the steam engine', *The Freeman: Ideas on Liberty*, pp. 14–17.

- Borkenhagen, L. (2018) *Gewerbe anmelden*. Available at: <https://www.gewerbe-anmelden.info/impresum.html> (Accessed: 20 June 2018).
- Bortz, J. (1984) *Lehrbuch der empirischen Forschung: für Sozialwissenschaftler*. Berlin/Heidelberg: Springer Verlag.
- Bortz, J. and Döring, N. (2006) *Forschungsmethoden und Evaluation*. 4th ed. Heidelberg: Springer Medizin Verlag.
- Böttger, F. (2008) 'Zwangslizenzen im Patentrecht – Eine systematische Bewertung der neueren Praxis insbesondere im Bereich der öffentlichen Gesundheit', *Gewerblicher Rechtsschutz und Urheberrecht Internationaler Teil*, 11.
- Boyle, J. (2006) 'Open Source Innovation, Patent, Injunctions, and the Public Interest', *Duke Law and Technology Review*, 11, pp. 30–64.
- Brabham, D. C. D. (2008) 'Crowdsourcing as a Model for Problem Solving. An Introduction and Cases', *Convergence: The International Journal of Research into New Media Technologies*, 14(1), pp. 75–90.
- Braitmayer, S.-E. (2011) '§1 Gebrauchsmusterfähigkeit', in Bühring, M. (ed.) *Gebrauchsmustergesetz. Kommentar*. 8th ed. Köln: Carl Heymanns Verlag.
- Braun, A. (2012) 'Open Innovation - Einführung in ein Forschungsparadigma', in Braun, A., Eppinger, E., Vladova, G., and Adelhelm, S. (eds) *Open Innovation in Life Sciences: Konzepte und Methoden offener Innovationsprozesse im Pharmamittelstand*. Wiesbaden: Springer Gabler Verlag, pp. 3–24.
- Braun, W. (1991) *Kooperation im Unternehmen: Organisation und Steuerung von Innovationen*. Wiesbaden: Gabler Verlag.
- Bremi, T. (2016) 'Art. 87 Prioritätsrecht', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Bremi, T. and Stauder, D. (2016a) 'Art. 60 Recht auf das Patent', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Bremi, T. and Stauder, D. (2016b) 'Art. 61 Anmeldung europäischer Patente durch Nichtberechtigte', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Bremi, T. and Stauder, D. (2016c) 'Art. 62 Recht auf Erfindernennung', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Breuer, M. (1997) 'Der erfinderische Schritt im Gebrauchsmusterrecht', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 11–18.

- Brusoni, S., Prencipe, A. and Pavitt, K. (2001) 'Knowledge specialization, organizational coupling, and the boundaries of the firm: why do firms know more than they make?', *Administrative Science Quarterly*, 46(4), pp. 597–621. doi: 10.2307/3094825.
- Buchanan, B. G. and Headrick, T. E. (1970) 'Some speculation about artificial intelligence and legal reasoning', *Stanford Law Review*, 23(1), pp. 40–62.
- Bund, M. (2000) *F&E-Outsourcing: Planung-Kontrolle-Integration*. Wiesbaden: Gabler Verlag/Deutscher Universitäts-Verlag.
- Bundesanzeiger (2009) *Änderung des Gesetzes über Arbeitnehmererfindungen*. Available at: http://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&jumpTo=bgbl109s2521.pdf (Accessed: 4 April 2018).
- Bundesministerium der Justiz und für Verbraucherschutz (2018) *Patentgesetz/gesetze-im-internet*. Available at: <http://www.gesetze-im-internet.de/patg/BJNR201170936.html#BJNR201170936BJNG000100311> (Accessed: 13 April 2018).
- Buntscheck, M. (2015) 'Die Durchsetzung standardessentieller Patente als Missbrauch einer marktbeherrschenden Stellung', *Neue Zeitschrift für Kartellrecht*, 12, pp. 521–525.
- Burk, D. L. and Lemley, M. A. (2009) *The patent crisis and how the courts can solve it*. Chicago: University of Chicago Press.
- Bußmann (1977) 'Patentrecht und Marktwirtschaft', *Gewerblicher Rechtsschutz und Urheberrecht*, (3), pp. 121–135.
- BVerfG (2001) 'Anwendung eines patentierten Arzneimittels zu Versuchszwecken', *Gewerblicher Rechtsschutz und Urheberrecht*, 1, pp. 43–45.
- Cezanne, W. (2005) *Allgemeine Volkswirtschaftslehre*. 6th ed. München: Oldenbourg Wissenschaftsverlag.
- Chahbaz, A. (2018) *An Introduction to Blockchain and its Applications. With a Focus on Energy Management*. Hamburg: Anchor Academic Publishing.
- Chesbrough, H. W. (2003) *Open Innovation. The new Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.
- Chesbrough, H. W. (2006) 'Open Innovation: A new paradigm for understanding industrial innovation', in Chesbrough, H. W., Vanhaverbeke, W., and West, J. (eds) *Open innovation: Researching a new paradigm*. New York: Oxford University Press.
- Chesbrough, H. W. and Crowther, A. K. (2006) 'Beyond high tech: early

- adopters of open innovation in other industries', *R&D Management*, 36(3), pp. 229–236.
- Chien, C. (2010) 'From Arms Race to Marketplace: The New Complex Patent Ecosystem and Its Implications for the Patent System', *Hastings Law Journal*, 62(297), pp. 297–356.
- Chu, A. C. (2009) 'Effects of blocking patents on R&D: a quantitative DGE analysis', *Journal of Economic Growth*, 14(1), pp. 55–78.
- Cohen, W. M. and Levinthal, D. A. (1990) 'Absorptive Capacity: A new perspective on learning and innovation', *Administrative Science Quarterly*, 35, pp. 128–152.
- Conrad, I. (2016) '§ 39 Kartellrechtliche Bezüge', in Auer-Reinsdorff, A. and Conrad, I. (eds) *Handbuch IT- und Datenschutzrecht*. 2nd ed. München: C.H.Beck.
- Davis, S. R. (2015) *Beginning Programming with C++ for Dummies*. 2nd ed. Hoboken, NJ, USA: John Wiley & Sons.
- Deinert, O. (2014) 'Kernbelegschaften – Randbelegschaften – Fremdbelegschaften – Herausforderungen für das Arbeitsrecht durch Reduzierung von Stammbeschaften', *RdA*, pp. 65–77.
- Deinzer, R. (2007) *Allgemeine Grundlagen wissenschaftlichen Arbeitens in der Medizin. Ein Leitfaden für die empirische Promotion und Habilitation*. Stuttgart: W. Kohlhammer GmbH.
- Deutscher Bundestag (2010) *Drucksache 17/1052, Antrag: Neue Initiative für Neuheitsschonfrist im Patentrecht starten*. Available at: <https://www.bundestag.de/service/suche?suchbegriff=Drucksache+17%2F1052> (Accessed: 20 June 2018).
- Deutsches Patentamt (1951) 'Eine anonyme Betriebserfindung kann nicht mehr anerkannt werden. Bei der Patentanmeldung müssen vielmehr bestimmte Personen als Erfinder benannt werden.', *Neue Juristische Wochenzeitschrift*, pp. 934–935.
- Diemer, H. (2017) 'GWB 1990 § 1 Verbot wettbewerbsbeschränkender Vereinbarungen', in Erbs, G. and Kohlhaas, M. (eds) *Strafrechtliche Nebengesetze*. 218th ed. Munich: C.H.Beck.
- Dittrich, K. and Duysters, G. (2007) 'Networking as a Means to Strategy Change: The Case of Open Innovation in Mobile Telephony', *Journal of Product Innovation Management*, 24(6), pp. 510–521.
- Dolder, F., Ann, C. and Buser, M. (2011) 'Beurteilung der Erfindungshöhe mit

Hilfe eines additiven multi-item Indexes', *Gewerblicher Rechtsschutz und Urheberrecht*, 113(3), pp. 177–183.

DPMA (2018a) *Antrag auf Erteilung eines Patents*. Available at: <https://www.dpma.de/docs/formulare/patent/p2007.pdf> (Accessed: 23 June 2018).

DPMA (2018b) *Das elektronische Dokumentenarchiv des DPMA*. Available at: <https://www.dpma.de/recherche/depatistnet/index.html> (Accessed: 23 June 2018).

DPMA (2018c) *DEPATISnet*. Available at: <https://depatistnet.dpma.de/DepatisNet/depatistnet?window=1&space=menu&content=index&action=index> (Accessed: 30 March 2018).

DPMA (2018d) *Erfinderbenennung*. Available at: <https://www.dpma.de/docs/formulare/patent/p2792.pdf> (Accessed: 26 May 2018).

DPMA (2018e) *International Patent Classification*. Available at: <https://depatistnet.dpma.de/ipc/ipc.do?s=H03&v=20180101&l=DE&dh=dh11&sn=n00&sci=i00#H03> (Accessed: 26 April 2018).

DPMA (2018f) *Priority Country, Application Country, Applicant*. Available at: <https://depatistnet.dpma.de/prod/de/hilfe/recherchierbarefelder/index.html#aPUB> (Accessed: 23 June 2018).

DPMA (2018g) *Recherche*. Available at: <https://www.dpma.de/recherche/dpmaregister/akteneinsicht/index.html> (Accessed: 23 June 2018).

Drucker, P. F. (1986) *Innovations-Management für Wirtschaft und Politik*. 3rd ed. Düsseldorf/Wien: Econ Verlag.

Dubiansky, J. (2006) 'The role of patents in fostering Open Innovation', *Virginia Journal of Law & Technology*, 11(7), pp. 1–36.

Dworatschek, S. (1989) *Grundlagen der Datenverarbeitung*. 8th ed. Berlin/New York: De Gruyter Verlag.

Eckel, P. (2017) 'Anspruch auf Lizenz einräumung aus FRAND-Erklärungen bei standardessentiellen Patenten – Teil 1', *Neue Zeitschrift für Kartellrecht*, 8.

Encaoua, D., Guellec, D. and Martínez, C. (2003) 'The economics of patents: from natural rights to policy instruments', *Cahiers de la MSE*.

Encaoua, D., Guellec, D., Martínez, C. and Martínez, C. (2006) 'Patent systems for encouraging innovation: Lessons from economic analysis', *Research Policy*, 35(9), pp. 1423–1440. doi: 10.1016/j.respol.2006.07.004.

- Encaoua, D. and Hollander, A. (2002) 'Competition policy and innovation', *Oxford Review of Economic Policy*, 18(1), pp. 63–79.
- Encaoua, D. and Lefouili, Y. (2005) 'Choosing intellectual protection: imitation, patent strength and licensing', *Annales d'Économie et de Statistique*, 79/80, pp. 241–271.
- Engels, R. (2016) '§59 Einspruch, Beitritt als Einsprechender', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsabkommens mit dem Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.
- Enkel, E., Gassmann, O. and Chesbrough, H. (2009) 'Open R&D and open innovation: exploring the phenomenon', *R&D Management*, 39(4), pp. 311–316.
- EPO (1983) 'T4/83 of 16.03.1983', *Official Journal of EPO*, p. 498.
- EPO (1984) 'T14/83 of 07.06.1983', *Official Journal of EPO*, p. 105.
- EPO (1986) 'T144/83 of 27.03.1986', *Official Journal of EPO*, p. 301.
- EPO (1987) 'T173/83 of 01.07.1985', *Official Journal of EPO*, p. 465.
- EPO (1990a) 'T381/87 of 10.10.1988', *Official Journal of EPO*, p. 213.
- EPO (1990b) *T444/88 of 09.05.1990*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t880444eu1.html> (Accessed: 4 June 2018).
- EPO (1991) *T153/88 of 09.01.1991*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t880153du1.html> (Accessed: 31 May 2018).
- EPO (1992) 'T482/89 of 11.12.1990', *Official Journal of EPO*, p. 646.
- EPO (1993a) 'G1/92 of 18.12.1992', *Official Journal of EPO*, p. 277.
- EPO (1993b) *T59/90 of 12.03.1993*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t900059du1.html#q%22T0059%2F90%22> (Accessed: 8 August 2018).
- EPO (1993c) 'T877/90 of 28.07.1992', *Special Edition of Official Journal of EPO*, p. 17.
- EPO (1994a) *T602/91 of 13.09.1994*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t910602du1.html> (Accessed: 4 June 2018).
- EPO (1994b) *T634/91 of 31.05.1994*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t910634du1.html> (Accessed: 4 June 2018).
- EPO (1994c) 'T830/90 of 23.07.1993', *Official Journal of EPO*, p. 713.

- EPO (1995a) 'T74/93 of 09.11.1994', *Official Journal of EPO*, p. 712.
- EPO (1995b) 'T782/92 of 22.06.1994', *Special Edition of Official Journal of EPO*, p. 28.
- EPO (1995c) 'T952/92 of 17.08.1994', *Official Journal of EPO*, p. 755.
- EPO (1996a) 'T585/92 of 09.02.1995', *Official Journal of EPO*, p. 129.
- EPO (1996b) T739/92 of 16.07.1996. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t920739eu1.html> (Accessed: 31 May 2018).
- EPO (1996c) T823/93 of 25.06.1996. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t930823fu1.html#q%22T0823%2F93%22> (Accessed: 4 June 2018).
- EPO (1997a) T292/93 of 13.02.1997. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t930292fu1.html> (Accessed: 4 June 2018).
- EPO (1997b) T809/95 of 29.04.1997. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t950809du1.html> (Accessed: 4 June 2018).
- EPO (1998a) 'T1054/92 of 20.06.1996', *Special Edition of Official Journal of EPO*, pp. 17, 53.
- EPO (1998b) T348/94 of 21.10.1998. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t940348eu1.html> (Accessed: 4 June 2018).
- EPO (1998c) 'T472/92 of 20.11.1996', *Official Journal of EPO*, p. 161.
- EPO (1998d) 'T750/94 of 01.04.1997', *Official Journal of EPO*, p. 32.
- EPO (1998e) 'T86/95 of 09.09.1997', *Special Edition of Official Journal of EPO*, p. 16.
- EPO (1998f) T901/95 of 29.10.1998. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t950901du1.html> (Accessed: 4 June 2018).
- EPO (1998g) 'T97/94 of 15.07.1997', *Official Journal of EPO*, p. 467.
- EPO (1999) 'Europäische Union: Bericht über die Anhörung am 5. Oktober 1998 zur Neuheitsschonfrist im Patentrecht', *Official Journal of EPO*, 22(3), pp. 155–165.
- EPO (2000a) T165/96 of 30.05.2000. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t960165fu1.html> (Accessed: 4 June 2018).
- EPO (2000b) T37/96 of 07.02.2000. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t960037eu1.html> (Accessed: 4 June 2018).
- EPO (2000c) T478/99 of 07.12.2000. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t990478eu1.html> (Accessed: 4 June 2018).
- EPO (2000d) T838/97 of 14.11.2000. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t970838eu1.html>

- practice/case-law-appeals/recent/t970838eu1.html (Accessed: 4 June 2018).
- EPO (2001a) *T1212/97 of 14.05.2001*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t971212eu1.html> (Accessed: 4 June 2018).
- EPO (2001b) 'T931/95 of 08.09.2000', *Official Journal of EPO*, p. 441.
- EPO (2002a) 'T1022/99 of 10.04.2001', *Special Edition of Official Journal of EPO*, p. 19.
- EPO (2002b) 'T314/99 of 21.06.2001', *Special Edition of Official Journal of EPO*, p. 17.
- EPO (2003) *T947/99 of 27.11.2003*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t990947eu1.html> (Accessed: 4 June 2018).
- EPO (2004a) 'T258/03 of 21.04.2004', *Official Journal of EPO*, p. 575.
- EPO (2004b) *T50/02 of 29.06.2004*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t020050eu1.html> (Accessed: 4 June 2018).
- EPO (2007) 'T1134/06 of 16.01.2007', *Special Edition of Official Journal of EPO*, (6), pp. 20, 52.
- EPO (2008a) *T1875/06 of 08.01.2008*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t061875eu1.html> (Accessed: 4 June 2018).
- EPO (2008b) 'T336/07 of 11.10.2007', *Special Edition of Official Journal of EPO*, p. 18.
- EPO (2009a) *T1309/07 of 23.06.2009*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t071309du1.html> (Accessed: 4 June 2018).
- EPO (2009b) *T1464/05 of 14.05.2009*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t051464eu1.html> (Accessed: 4 June 2018).
- EPO (2009c) *T1829/06 of 10.11.2009*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t061829eu1.html> (Accessed: 4 June 2018).
- EPO (2010) *T1168/09 of 15.10.2010*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t091168du1.html> (Accessed: 4 June 2018).
- EPO (2011) *T2339/09 of 17.11.2011*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t092339du1.html> (Accessed: 4 June 2018).
- EPO (2012a) *T1553/06 of 12.03.2012*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t061553eu1.html> (Accessed: 4 June 2018).
- EPO (2012b) *T2/09 of 12.03.2012*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t090002eu1.html> (Accessed: 4 June 2018).

EPO (2012c) *T990/09 of 03.07.2012*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t090990eu1.html> (Accessed: 4 June 2018).

EPO (2014) *T286/10 of 21.05.2014*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t100286fu1.html> (Accessed: 4 June 2018).

EPO (2016) *Übereinkommen über die Erteilung europäischer Patente (Europäisches Patentübereinkommen)*. Available at: [http://documents.epo.org/projects/babylon/eponet.nsf/0/029F2DA107DD667FC125825F005311DA/\\$File/EPC_16th_edition_2016_de.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/029F2DA107DD667FC125825F005311DA/$File/EPC_16th_edition_2016_de.pdf) (Accessed: 8 August 2018).

EPO (2018a) *Antrag auf Erteilung eines europäischen Patents*. Available at: [documents.epo.org/projects/babylon/eponet.nsf/0/5C683C367A8DFBC7C12577F400449FD8/\\$FILE/epo_form_1001_03_18_editable.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/5C683C367A8DFBC7C12577F400449FD8/$FILE/epo_form_1001_03_18_editable.pdf) (Accessed: 23 June 2018).

EPO (2018b) *Erfindernennung*. Available at: [documents.epo.org/projects/babylon/eponet.nsf/0/FD7E907381446E11C125737E004E0ED7/\\$File/1002_form-edit_12_07.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/FD7E907381446E11C125737E004E0ED7/$File/1002_form-edit_12_07.pdf) (Accessed: 26 May 2018).

EPO (2018c) *Europäisches Patentregister*. Available at: <https://register.epo.org/regviewer?lng=de> (Accessed: 30 March 2018).

EPO (2018d) *Europäisches Patentregister Erweiterte Suche*. Available at: <https://register.epo.org/advancedSearch?lng=de> (Accessed: 24 April 2018).

Estelles-Arolas, E. and Gonzalez-Ladron-de-Guevara, F. (2012) 'Towards an integrated crowdsourcing definition', *Journal of Information Science*, 38(2), pp. 189–200.

EuGH (2015) 'Zur Lizenzierungspflicht bei einem standardessenziellen Patent', *NZKart*, 5, pp. 247–251.

Faber, M. J. (2008) *Open Innovation: Ansätze, Strategien und Geschäftsmodelle*. Gabler GWV Fachverlage GmbH.

von Falck, A. and Apetz, M. (2017) 'Patentrecht', in Taeger, J. and Pohle, J. (eds) *Computerrechts-Handbuch. Informationstechnologie in der Rechts- und Wirtschaftspraxis*. 33th ed. Munich: C.H.Beck.

Ferrary, M. (2011) 'Specialized organisations and ambidextrous clusters in the open innovation paradigm', *European Management Journal*, 29(3), pp. 181–192.

Fischer, E. (1977) 'Verwertungsrechte bei Patentgemeinschaften', *Gewerblicher Rechtsschutz und Urheberrecht*, 6, pp. 313–318.

Fisk, C. L. (1998) 'Removing the 'Fuel of Interest' from the 'Fire of Genius': Law and the Employee-Inventor, 1830-1930', *The University of Chicago Law Review*, 65(4), pp. 1127–1198.

- Frambach, H. (2018) *Basiswissen Mikroökonomie*. 4th ed. Konstanz/München: UVK Verlagsgesellschaft mbH.
- Franke, N. and von Hippel, E. (2003) 'Satisfying heterogeneous user needs via innovation toolkits: the case of Apache security software', *Research Policy*, 32(7), pp. 1199–1215.
- Franke, N. and Shah, S. (2003) 'How communities support innovative activities: an exploration of assistance and sharing among end-users', *Research Policy*, 32(1), pp. 157–178.
- Franzoni, C. and Sauermann, H. (2014) 'Crowd science: The organization of scientific research in open collaborative projects', *Research Policy*. Elsevier B.V., 43(1), pp. 1–20. doi: 10.1016/j.respol.2013.07.005.
- Freiling, J. and Reckenfelderbäumer, M. (2010) *Markt und Unternehmung. Eine marktorientierte Einführung in die Betriebswirtschaftslehre*. 3rd ed. Wiesbaden: Springer Gabler Verlag.
- Fries, M. (2016) 'PayPal Law und Legal Tech - Was macht die Digitalisierung mit dem Privatrecht?', *Neue Juristische Wochenschrift*, 39, pp. 2860–2865.
- Fuchs (2012) 'FuE-GVO Artikel 1. Begriffsbestimmungen', in Immenga, U., Mestmäcker, E.-J., and Körber, T. (eds) *EU-Wettbewerbsrecht Band 1*. 5th ed. Munich: C.H.Beck.
- Fuchs, A. (2015) 'Kartellrechtliche Schranken für patentrechtliche Unterlassungsklagen bei FRAND-Lizenzklärungen für standardessentielle Patente - Perspektiven nach dem Urteil des EuGH im Fall "Huawei Technologies/ZTE"', *Neue Zeitschrift für Kartellrecht*, 10, pp. 429–436.
- Für-Gründer.de (2018) *Für-Gründer.de*. Available at: <https://www.fuer-gruender.de/wissen/unternehmen-gruenden/unternehmensformen/gesellschaftsformen/> (Accessed: 4 June 2018).
- Gallini, N. T. (2014) 'Cooperating with competitors: Patent pooling and choice of a new standard', *International Journal of Industrial Organization*, 36, pp. 4–21. doi: 10.1016/j.ijindorg.2014.02.003.
- Garcia, R. and Calantone, R. (2002) 'A critical look at technological innovation typology and innovativeness: a literature review', *The Journal of Product Innovation Management*, 19(2), pp. 110–132. doi: 10.1016/S0737-6782(01)00132-1.
- Gassmann, O. (2006) 'Innovation und Risiko - zwei Seiten einer Medaille', in Gassmann, O. and Kobe, C. (eds) *Management von Innovation und Risiko. Quantensprünge in der Entwicklung erfolgreich managen*. 2nd ed. Berlin/Heidelberg: Springer Verlag.

Gassmann, O. and Enkel, E. (2004) 'Towards a theory of open innovation: three core process archetypes', *R&D Management Conference RADMA*, pp. 1–18. doi: 10.1.1.149.4843.

Gassmann, O., Enkel, E. and Chesbrough, H. (2010) 'The future of open innovation', *R&D Management*. Blackwell Publishing Ltd, 40(3), pp. 213–221. doi: 10.1111/j.1467-9310.2010.00605.x.

Gassmann, O., Sandmeier, P. and Wecht, C. H. (2004) 'Innovationsprozesse: Öffnung statt Alleingang', *io new management*, 1–2, pp. 22–27.

Geschka, H. and Meitinger, T. H. (2016) 'Crowdsourcing und Intellectual Property Rights: Fallstricke einer besonderen rechtlichen Konstellation', *Innovation Management Support*, II, pp. 28–34.

Geschka, H. and Meitinger, T. H. (2018) 'Wann verlieren Erfindungen ihre Patentfähigkeit? Zur juristischen Situation und Fälle aus der Praxis', *Innovation Management Support*, I.

Ghafele, R., Gibert, B. and DiGiammarino, P. (2011) 'Driving innovation through patent application review: The power of crowdsourcing prior art search', *Journal of Intellectual Property Rights*, 16(4), pp. 303–308.

Gilbert, R. J. and Newbery, D. M. G. (1982) 'Preemptive patenting and the persistence of monopoly', *The American Economic Review*, 72(3), pp. 514–526.

Glatz, F. (2016) 'Technological solutions to legal problems? A report on a two-day workshop in Münster on the Digital Revolution in Europe', *Journal of European Consumer and Market Law*, 1, pp. 67–68.

Goebel, F. P. and Engel, F.-W. (2015a) '§3 GebrMG Erfordernisse der Anmeldung, Änderung, Teilung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.

Goebel, F. P. and Engel, F.-W. (2015b) '§5 GebrMG Abzweigung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.

Götze, W., Deutschmann, C. and Link, H. (2002) *Statistik: Lehr- und Übungsbuch mit Beispielen aus der Tourismus- und Verkehrswirtschaft*. Munich: Oldenbourg Wissenschaftsverlag.

Gould, D. and Gruben, W. (1996) 'The role of intellectual property rights in economic growth', *Journal of development economics*, 48(2), pp. 323–350.

Griffiths, D. (2009) *Statistik von Kopf bis Fuß*. Cologne: O'Reilly Verlag.

Grundmann, B. (2011) 'Schutzrechte - Funktion und Begrenzung', *Gewerblicher Rechtsschutz und Urheberrecht*, 113(2), pp. 89–92.

- Grupp, H. (1997) *Messung und Erklärung des technischen Wandels: Grundzüge einer empirischen Innovationsökonomik*. Berlin/Heidelberg: Springer Verlag.
- Guille, A., Hacid, H., Favre, C. and Zighed, D. A. (2013) 'Information diffusion in online social networks: A survey', *ACM SIGMOD Record*, 42(2), pp. 17–28.
- Hagedoorn, J. (2002) 'Inter-firm R&D partnerships: an overview of major trends and patterns since 1960', *Research Policy*. North-Holland, 31(4), pp. 477–492. doi: 10.1016/S0048-7333(01)00120-2.
- Hagedoorn, J. and Zobel, A.-K. (2015) 'The role of contracts and intellectual property rights in open innovation', *Technology Analysis & Strategic Management*, 27(9), pp. 1050–1067. doi: 10.1080/09537325.2015.1056134.
- Hagenhoff, S. (2008) *Innovationsmanagement für Kooperationen. Eine instrumentenorientierte Betrachtung*. Göttingen: Universitätsverlag Göttingen.
- Hahn, N. (2017) *GbR, UG, GmbH & Co. Die richtige Gesellschaftsform für meine Gründung*. 2nd ed. Munich: C.H.Beck.
- Hardes, H.-D. and Uhly, A. (2007) *Grundzüge der Volkswirtschaftslehre*. 9th ed. Munich: Oldenbourg Wissenschaftsverlag.
- Harhoff, D. and Hoisl, K. (2007) 'Institutionalized incentives for ingenuity-Patent value and the German Employees' Inventions Act', *Research Policy*, 36(8), pp. 1143–1162. doi: 10.1016/j.respol.2007.07.010.
- Harris, C. and Vickers, J. (1985) 'Patent races and the persistence of monopoly', *The Journal of Industrial Economics*, 33(4), pp. 461–481.
- Hartweg, H.-R., Kaestner, R., Lohmann, H., Proff, M. and Wessels, M. (2015) *Verbesserung der Performance durch Open Innovation-Ansätze. Von neuartigen Verfahren zur Suche nach Differenzierungsvorteilen im Krankenhaus*. Wiesbaden: Springer Gabler Verlag.
- Hauck, R. (2015) "'Erzwungene" Lizenzverträge – Kartellrechtliche Grenzen der Durchsetzung standardessenzieller Patente', *NJW*, 38, pp. 2767–2770.
- Hauschildt, J. (2004) *Innovationsmanagement*. 3rd ed. Munich: Verlag Franz Vahlen.
- Häußer, E. and Goebel, F. P. (1990) '20 Jahre Offenlegung von Patentanmeldungen aus der Sicht des Deutschen Patentamts', *Gewerblicher Rechtsschutz und Urheberrecht Internationaler Teil*, pp. 723–727.
- Heinemann, A. (2002) *Immaterialgüterschutz in der Wettbewerbsordnung: eine grundlagenorientierte Untersuchung zum Kartellrecht des geistigen Eigentums*. Tübingen: Mohr Siebeck.

- Heller, M. A. and Eisenberg, R. S. (1998) 'Can patents deter innovation? The anticommons in biomedical research', *Science*, 280(5364), pp. 698–701.
- Henke, V. (2007) 'Interessengemäße Erfindungsverwertung durch mehrere Patentinhaber "Gummielastische Masse II" und seine Auswirkungen', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 89–95.
- Henkel, J. (2006) 'Selective Revealing in Open Innovation Processes: The Case of Embedded Linux', *Research Policy*, 35(7), pp. 953–969. doi: 10.1016/j.respol.2006.04.010.
- Heusler, N. and Stauder, D. (2016a) 'Art. 94 Prüfung der Anmeldung', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Heusler, N. and Stauder, D. (2016b) 'Art. 97 Erteilung oder Zurückweisung', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Hildner, A. (2016) 'Bitcoins auf dem Vormarsch: Schaffung eines regulatorischen Level Playing Fields?', *Zeitschrift für Bank- und Kapitalmarktrecht*, 12, pp. 485–495.
- von Hippel, E. (1976) 'The dominant role of users in the scientific instrument innovation process', *Research Policy*, 5(3), pp. 212–239.
- von Hippel, E. (1978) 'Successful industrial products from customer ideas', *Journal of Marketing*, 42(1), pp. 39–49.
- von Hippel, E. and von Krogh, G. (2006) 'Free revealing and the private-collective model for innovation incentives', *R&D Management*, 36(3), pp. 295–306.
- Holbrook, T. (2006) 'Possession in Patent Law', *SMUL Rev.*
- Holt, K. (1988) 'The role of the user in product innovation', *Technovation*, 7(3), pp. 249–258.
- Holzapfel, H. (2006) 'Die patentrechtliche Zulässigkeit der Benutzung von Forschungswerkzeugen', *Gewerblicher Rechtsschutz und Urheberrecht*, 1, pp. 10–17.
- Howe, J. (2006) *The rise of crowdsourcing*, *Wired Magazine*. Available at: <https://www.wired.com/2006/06/crowds/> (Accessed: 21 July 2018).
- Hrdy, C. A. (2012) 'Dissenting State Patent Regimes', *IP Theory*, 3(2), pp. 78–97.
- Hufnagel, F.-E. (2006) 'Ausweitung des Versuchsprivilegs in Europa und den USA – Verschiebung der Grenzen zwischen Patentschutz und Versuchsfreiheit bei Arzneimitteln', *Pharmarecht*, 5, pp. 209–215.

- Hufnagel, F.-E. (2010) '§ 14 Schutz von Erfindungen in den Bereichen der Pharmazie und Biotechnologie', in Dieners, P. and Reese, U. (eds) *Handbuch des Pharmarechts*. Munich: C.H.Beck.
- Hughes, T. P. (1989) *American Genesis. A Century of invention and technological enthusiasm, 1870-1970*. Chicago: University of Chicago Press.
- Hunt, R. (1999) 'Patent reform: a mixed blessing for the US economy', *Business Review*.
- Hüttermann, A. (2013) 'Zwei Thesen über Patente. Was sind Patente?', *Mitteilungen der deutschen Patentanwälte*, 104(4), pp. 181–187.
- Ili, S. (2010) 'Grundlagen und Theorien zum Innovationsbegriff', in Ili, S. (ed.) *Open Innovation umsetzen: Prozesse, Methoden, Systeme, Kultur*. 1st ed. Düsseldorf: Symposium Publishing GmbH, pp. 21–41.
- Janeiro, P., Proença, I. and da Conceição Gonçalves, V. (2013) 'Open Innovation: Factors explaining universities as service firm innovation sources', *Journal of Business Research*, 66(10), pp. 2017–2023.
- Jeon, J., Lee, C. and Park, Y. (2011) 'How to use patent information to search potential technology partners in open innovation', *Journal of Intellectual Property Rights*, 16(5), pp. 385–393.
- de Jong, J. P. J., Kalvet, T. and Vanhaverbeke, W. (2010) 'Exploring a theoretical framework to structure the public policy implications of open innovation', *Technology Analysis & Strategic Management*, 22(8), pp. 877–896. doi: 10.1080/09537325.2010.522771.
- de Jong, J. P. J., Vanhaverbeke, W., Kalvet, T. and Chesbrough, H. (2008) *Policies for Open Innovation: Theory, framework and cases*, *Vision Era-Net*.
- Jordan, W. and Urban, H. (1978) *Strukturierte Programmierung*. Berlin/Heidelberg: Springer Verlag.
- Jungmeister, A. (2016) *Innovation and Reflexivity in the Research Process*. Newcastle upon Tyne, UK: Cambridge Scholars Publishing.
- Kalogerakis, K. (2010) *Innovative Analogien in der Praxis der Produktentwicklung*. Wiesbaden: Gabler Verlag/Springer Fachmedien Wiesbaden GmbH.
- Kantzenbach, E. and Kruse, J. (1989) *Kollektive Marktbeherrschung*. Göttingen: Vandenhoeck & Ruprecht.
- Kato, A. (2004) 'Patent pool enhances market competition', *International Review of Law and Economics*, 24(2), pp. 255–268.
- Kellermann, A. (1958) 'Die gewerblichen Schutzrechte im Gesetz gegen

Wettbewerbsbeschränkungen', *Gewerblicher Rechtsschutz und Urheberrecht*, 12, pp. 575–627.

Keukenschrijver, A. (2016a) '§1 ArbEG', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsvereins mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016b) '§1 Patentfähige Erfindungen', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsvereins mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016c) '§10 Mittelbare Patentverletzung/Patentgefährdung', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsvereins mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016d) '§139 Rechtsverletzungen', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsvereins mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016e) '§22 Nichtigkeit des Patents', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsvereins mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016f) '§3 GebrMG', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsvereins mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016g) '§3 Neuheit', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentrechtsvereins mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016h) '§31 Akteneinsicht', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016i) '§35 Anmeldetag; Nachreichung von Zeichnungen und Beschreibungsteilen', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016j) '§4 erfinderische Tätigkeit', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016k) '§6 ArbEG', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016l) '§6 Recht auf das Patent', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016m) '§63 Erfindernennung', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016n) '§8 Abtretungs- und Übertragungsanspruch; Klage', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016o) '§9 Wirkung des Patents', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016p) 'Einl ArbEG', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016q) 'Einleitung Grundlagen des deutschen Patentrechts', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keukenschrijver, A. (2016r) 'Vor §50 Geheimanmeldungen und Geheimpatente', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.

Keupp, M. and Gassmann, O. (2009) 'Determinants and archetype users of open innovation', *R&D Management*, 39(4), pp. 331–341.

Kim, S.-H. (2004) 'Vertical structure and patent pools', *Review of Industrial Organization*, 25(3), pp. 231–250.

Klawitter, C. (2016) '§ 14 EU- und deutsches Kartellrecht', in Wiedemann, G. (ed.) *Handbuch des Kartellrechts*. 3rd ed. Munich: C.H.Beck.

Kogut, B. (2000) 'The network as knowledge: Generative rules and the emergence of structure', *Strategic Management Journal*, 21(3), pp. 405–425. doi: 10.1002/smj.2495.

Kolle, G. (1977) 'Technik Datenverarbeitung und Patentrecht. Bemerkungen zur Dispositionsprogramm-Entscheidung des Bundesgerichtshofs', *Gewerblicher Rechtsschutz und Urheberrecht*, 2, pp. 58–74.

Köllner, M. and Weber, P. (2014) 'Trolls and their consequences - an evolving IP ecosystem', *Mitteilungen der deutschen Patentanwälte*, 105(3), pp. 106–114.

Körber, T. (2013a) 'Kartellrechtlicher Zwangslizenz einwand und

- standardessentielle Patente', *NZKart*, 3, pp. 87–98.
- Körber, T. (2013b) 'Missbräuchliche Patentunterlassungsklagen vor dem Aus?', *NZKart*, 6, pp. 239–241.
- Kraßer, R. (2001) 'Erweiterung des patentrechtlichen Erfindungsbegriffs?', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 959–965.
- Kraßer, R. and Ann, C. (2016) *Patentrecht. Lehrbuch zum deutschen und europäischen Patentrecht und Gebrauchsmusterrecht*. 7. Auflage. Munich: C.H.Beck.
- Krogh, G. Von, Spaeth, S. and Lakhani, K. (2003) 'Community, joining, and specialization in open source software innovation: a case study', *Research Policy*, 32, pp. 1217–1241.
- Kroher, J. (2016) 'Art. 56 Erfinderische Tätigkeit', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Kulhavy, S. V. (2011) 'Der Fachmann im Patentwesen', *Mitteilungen der deutschen Patentanwälte*, 102(4), pp. 179–183.
- Langinier, C. and Moschini, G. (2002) 'The economics of patents', in Rothschild, M. F. and Newman, S. (eds) *Intellectual Property Rights in Animal Breeding and Genetics*. Wallingford, UK: CABI Publishing, pp. 31–50.
- Laurence, T. (2017) *Blockchain for Dummies*. Hoboken, NJ, USA: John Wiley & Sons.
- Laursen, K. and Salter, A. (2006) 'Open for innovation: the role of openness in explaining innovation performance among UK manufacturing firms', *Strategic Management Journal*, 27(2), pp. 131–150.
- Layne-Farrar, A. and Lerner, J. (2011) 'To join or not to join: Examining patent pool participation and rent sharing rules', *International Journal of Industrial Organization*, 29(2), pp. 294–303.
- Lee, N. (2009) 'Exclusion and coordination in collaborative innovation and patent law', *International Journal of Intellectual Property Management*, 3(1), pp. 79–93.
- Lemley, M. (2012) 'The myth of the sole inventor', *Michigan Law Review*, 110(5), pp. 709–760.
- Lerner, J. (2009) 'The empirical impact of intellectual property rights on innovation: puzzles and clues', *The American Economic Review*, 99(2), pp. 343–348.
- Lerner, J. and Tirole, J. (2007) 'Public policy toward patent pools', *Innovation*

Policy and the Economy, 8, pp. 157–186.

Lévêque, F. and Ménière, Y. (2011) 'Patent pool formation: Timing matters', *Information Economics and Policy*, 23(3–4), pp. 243–251.

Levinson, S. and Mailloux, S. (1991) 'Preface', in Levinson, S. and Mailloux, S. (eds) *Interpreting Law and Literature. A Hermeneutic Reader*. Evanston, Illinois, USA: Northwestern University Press, pp. ix–xiii.

Lichtenthaler, U. (2011) 'Open innovation: Past research, current debates, and future directions', *Academy of Management Perspectives*, 25(1), pp. 75–93.

Lindner, A. K. (2016a) 'Art. 54 Neuheit', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.

Lindner, A. K. (2016b) 'Art 55 Unschädliche Offenbarungen', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.

von der Lippe, P. (2011) *Wie groß muss meine Stichprobe sein, damit sie repräsentativ ist?* Available at: <http://von-der-lippe.org/dokumente/Wieviele.pdf> (Accessed: 31 March 2018).

Llanes, G. and Trento, S. (2012) 'Patent policy, patent pools, and the accumulation of claims in sequential innovation', *Economic Theory*, 50(3), pp. 703–725.

Lober, A. and Just, C. (2010) *Welche Gesellschaftsform ist die beste für Unternehmensgründer?* Available at: <https://www.gruenderszene.de/allgemein/gesellschaftsformen-fur-die-unternehmensgruendung> (Accessed: 4 June 2018).

Loose, A., Schlüter, R., Stoffels, G. and Unger, G. (2011) 'Rechtliche Gestaltung von Unternehmensnetzwerken', in Becker, T., Dammer, I., Howaldt, J., and Loose, A. (eds) *Netzwerkmanagement: Mit Kooperation zum Unternehmenserfolg*. 3rd ed. Berlin/Heidelberg: Springer Verlag.

Loren, J. K. (2011) 'Chapter 1: What is Open Innovation?', in Sloane, P. (ed.) *A guide to open innovation and crowdsourcing: practical tips advice and examples from leading experts in the field*. London: Kogan Page.

Lüdecke, W. (1962) *Erfindungsgemeinschaften (Rechte und Pflichten des Miterfinders)*. Berlin: De Gruyter Verlag.

Luginbühl, S. (2016) 'Art. 64 Rechte aus dem Patent', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.

Lunney Jr., G. S. (2001) 'E-Obviousness', *Mich. Telecomm. & Tech. L. Rev.*, 7(1).

- Machlup, F. (1958) *An economic review of the patent system*. Washington: U.S. Govt. Print. Off.
- Machlup, F. and Penrose, E. (1950) 'The patent controversy in the nineteenth century', *The Journal of Economic History*, 10(1), pp. 1–29.
- Maggiolino, M. and LillaMontagnani, M. (2011) 'From Open Source Software to Open Patenting - What's new in the realm of Openness', *IIC*, pp. 804–832.
- Mansfield, E. (1986) 'Patents and innovation: an empirical study', *Management Science*, 32(2), pp. 173–181.
- McAdam, R., Armstrong, G. and Kelly, B. (1998) 'Investigation of the relationship between total quality and innovation: a research study involving small organisations', *European Journal of Innovation Management*, 1(3), pp. 139–147.
- Mediger, H. (1952) 'Gedanken eines Praktikers zur Regelung des Rechts des Angestellten-Erfinders', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 67–79.
- Meier, K. (1998) 'Bewährtes deutsches Arbeitnehmererfinderrecht?', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 779–785.
- Meitinger, T. H. (2016) 'Crowdsourcing und Patentrecht. Wie passt das zusammen?', *Mitteilungen der deutschen Patentanwälte*, 107(12), pp. 532–540.
- Meitinger, T. H. (2017a) 'Die Offenlegung der Patentanmeldung nach 18 Monaten: Ist das noch zeitgemäß?', *Mitteilungen der deutschen Patentanwälte*, 108(7/8), pp. 303–305.
- Meitinger, T. H. (2017b) 'Does Open Innovation result in Intellectual Property Rights?', in *Geopolitical Strategy in central Europe*, p. 26.
- Meitinger, T. H. (2017c) 'Does Open Innovation result in patent applications?', *conference proceedings CD*.
- Meitinger, T. H. (2017d) 'Erfinderlose Erfindungen durch Know-how einer Organisation und Erfinderprinzip: kein Widerspruch', *Mitteilungen der deutschen Patentanwälte*, 108(4), pp. 149–151.
- Meitinger, T. H. (2017e) *Fehlt ein passendes Patentgesetz als Antwort auf die digitale Kommunikation?* Edited by M. Stumpf. Essen: KCM KompetenzCentrum für Marketing & Medienwirtschaft.
- Meitinger, T. H. (2017f) 'Smart Contracts', *Informatik-Spektrum*. doi: 10.1007/s00287-017-1045-2.
- Melullis, K.-J. (2015a) '§3 PatG Begriff der Neuheit', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich:

C.H.Beck.

Melullis, K.-J. (2015b) '§6 PatG Recht des Erfinders', in *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.

Melullis, K.-J. (2015c) '§8 PatG Patentvindikation', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.

Menninger, J. and Wurzer, A. J. (2014) *Bewertungsstandards für Patente und Marken. Kommentare zu DIN 77100, DIN ISO 10668, IDW S5 und IVS 210*. Weinheim: Wiley-VCH Verlag & Co. KGaA.

MMR-Aktuell (2016) 'EU: Vorteile und Nachteile virtueller Währungen', *MMR-Aktuell*, 3.

Moir, H. V. J. (2009) 'How high is the inventive step? Some empirical evidence', in *4th Annual Conference of the EPIP Association*.

Morabito, V. (2017) *Business Innovation Through Blockchain: The B3 Perspective*. Cham, Switzerland: Springer International Publishing.

Moufang, R. (2017a) '§1 Patentfähige Erfindungen', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Moufang, R. (2017b) '§3 Neuheit', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Moufang, R. (2017c) '§34 Offenbarung der Erfindung/disclosure of the invention', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Moufang, R. (2017d) '§35 Anmeldetag, fehlende Zeichnungen und Beschreibungsteile', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Moufang, R. (2017e) '§35a Fremdsprachige Anmeldung/patent application in a foreign language', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Moufang, R. (2017f) '§37 Erfinderbenennung', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen*

- und europäischen Rechtsprechung*. 10nd ed. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017g) '§4 erfinderische Tätigkeit', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017h) '§40 Innere Priorität', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017i) '§41 Prioritätsrecht/priority right', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017j) '§5 Gewerbliche Anwendbarkeit/Industrial application', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017k) '§59 Einspruchsverfahren', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017l) '§6 Das Recht an der Erfindung', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017m) '§63 Erfindernennung', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Moufang, R. (2017n) '§8 Erfinderrechtliche Vindikation', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Mowery, D. C. and Rosenberg, N. (1999) *Paths of innovation: Technological change in 20th-Century America*.
- Mueller-Vollmer, K. (2006) 'Introduction - Language, Mind, and Artifact: An Outline of Hermeneutic Theory since the Enlightenment', in Mueller-Vollmer, K. (ed.) *The Hermeneutic Reader - Texts of the German Tradition from the Enlightenment to the Present*. New York: Continuum.
- Münch, V. (2010) *Patente, Marken, Design von A bis Z*. Weinheim: Wiley-VCH

Verlag & Co. KGaA.

Murray, F. and Stern, S. (2007) 'Do formal intellectual property rights hinder the free flow of scientific knowledge?: An empirical test of the anti-commons hypothesis', *Journal of Economic Behavior & Organization*, 63(4), pp. 648–687.

Myers, S. A., Zhu, C. and Leskovec, J. (2012) 'Information diffusion and external influence in networks', *Proceedings of the 18th ACM SIGKDD international conference on Knowledge discovery and data mining*, pp. 33–41.

Nack, R. (2014) 'Der Erfindungsbegriff - eine gesetzgeberische Fehlkonstruktion?', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 148–151.

Nakamura, M., Kimura, Y., Nhat, P., Minh, Q., Nguyen, M. Le and Shinazu, A. (2010) 'Treatment of Legal Sentences Including Itemization Written in Japanese, English and Vietnamese – Towards Translation into Logical Forms –', *Journal of Natural Language Processing*, 17(3), pp. 81–100.

Nakamura, M., Nobuoka, S. and Shimazu, A. (2007) 'Towards translation of legal sentences into logical forms', *Annual Conference of the Japanese Society for Artificial Intelligence*, pp. 349–362.

Neef, A. (2008) *Kartellrecht*. Heidelberg: C.F.Müller Verlag.

Neuburger, B. M. (2005) *Die Bewertung von Patenten. Theorie, Praxis und der neue Conjoint-Analyse Ansatz*. Göttingen: Cuvillier Verlag.

Nicolai, T. R. (1972) 'First-to-file vs. First-to-invent: A comparative study based on German and United States Patent Law', *International Review of Intellectual Property and Competition Law*, pp. 103–138.

Nordemann, J. B. (2016) 'GWB § 2 Freigestellte Vereinbarungen', in Loewenheim, U., Meessen, K. M., Riesenkampff, A., Kersting, C., and Meyer-Lindemann, H. J. (eds) *Kartellrecht. Europäisches und Deutsches Kartellrecht. Kommentar*. 3rd ed. Munich: C.H.Beck.

Oehlich, M. (2006) 'Arbeitnehmererfindungsgesetz und Innovationsfähigkeit. Gedanken über Anwendung und Auswirkungen in der pharmazeutischen Industrie', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 17–21.

Offenburger, O. (2014) *Patent und Patentrecherche. Praxisbuch für KMU, Start-ups und Erfinder*. Wiesbaden: Springer Gabler Verlag.

OLG Düsseldorf (1971) '30.10.1970 - 2 U 68/69 "Einsackwaage"', *Gewerblicher Rechtsschutz und Urheberrecht*, 5, pp. 215–218.

Ordober, J. A. (1991) 'A Patent System for Both Diffusion and Exclusion', *Journal of Economic Perspectives*, 5(1), pp. 43–60. doi: 10.1257/jep.5.1.43.

Osterrieth, C. (2015a) '4. Teil. Gegenstand, Voraussetzungen und Wirkung des

- Patentschutzes', in *Patentrecht*. 5th ed. Munich: C.H.Beck.
- Osterrieth, C. (2015b) '5. Teil. Patent im Rechtsverkehr', in *Patentrecht*. 5th ed. Munich: C.H.Beck.
- Paal, B. P. (2018) 'GWB § 2 Freigestellte Vereinbarungen', in Gersdorf, H. and Paal, B. P. (eds) *Informations- und Medienrecht*. 19th ed. Munich: C.H.Beck.
- Papsdorf, C. (2009) *Wie surfen zu Arbeit wird. Crowdsourcing im Web 2.0*. Frankfurt/New York: Campus Verlag.
- Peifer, K.-N. (2001) *Individualität im Zivilrecht: der Schutz persönlicher, gegenständlicher und wettbewerblicher Individualität im Persönlichkeitsrecht, Immaterialgüterrecht und Recht der Unternehmen*. Tübingen: Mohr Siebeck.
- Petroni, G., Venturini, K. and Verbano, C. (2012) 'Open innovation and new issues in R&D organization and personnel management', *The International Journal of Human Resource Management*, 23(1), pp. 147–173. doi: 10.1080/09585192.2011.561250.
- Picht, P. (2014) 'Standardsetzung und Patentmissbrauch – Schlagkraft und Entwicklungsbedarf des europäischen Kartellrechts', *Gewerblicher Rechtsschutz und Urheberrecht Internationaler Teil*, 1(1), pp. 1–17.
- Pimparkhede, K. (2017) *Computer Programming with C++*. Cambridge, UK: Cambridge University Press.
- Pitz, J. (2010) 'Teil 4. Rechtsansprüche des Patentinhabers und Einwendungen des Verletzers', in *Patentverletzungsverfahren: Grundlagen - Praxis - Strategie*. 2nd ed. Munich: C.H.Beck.
- Plitt, D. and Fischer, R. (2016) 'Kryptowährungen im Arbeitsrecht', *Neue Zeitschrift für Arbeitsrecht*, 13, pp. 799–803.
- Porta, M., House, B., Buckley, L. and Blitz, A. (2008) 'Value 2.0: eight new rules for creating and capturing value from innovative technologies', *Strategy & Leadership*, 36(4), pp. 10–18.
- Posner, R. A. (1975) 'The social costs of monopoly and regulation', *Journal of Political Economy*, 83(4), pp. 807–828.
- Pretnar, B. (2004) 'Die ökonomische Auswirkung von Patenten in der wissensbasierten Marktwirtschaft', *Gewerblicher Rechtsschutz und Urheberrecht Internationaler Teil*, 9, pp. 776–786.
- Priest, G. L. (1977) 'Cartels and patent license arrangements', *Journal of Law and Economics*, 20(2), pp. 309–377.
- van Raden, L. (1995) 'Die Informatorische Taube - Überlegungen zur

Patentfähigkeit informationsbezogener Erfindungen', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 451–458.

Redaktion FD-ArbR (2016) 'Studie zu Crowd Workern: Gut ausgebildet, teilweise nicht abgesichert, im Hauptjob nur rund 1.500 EUR Durchschnittseinkommen', *Aktuelle Nachrichten FD-ArbR*, 380776.

Reich, L. S. (1985) *The making of American industrial research: science and business at GE and Bell, 1876-1926*. Cambridge, UK: Cambridge University Press.

Richardson, G. B. (1972) 'The Organisation of Industry', *The Economic Journal*. WileyRoyal Economic Society, 82(327), pp. 883–896. doi: 10.2307/2230256.

Rigby, D. K. and Zook, C. (2002) *Open-market Innovation*, *Harvard Business Review*. Available at: <https://hbr.org/2002/10/open-market-innovation> (Accessed: 18 June 2018).

Rinken, I. (2017a) '§10 Mittelbare Benutzung des Patents', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Rinken, I. (2017b) '§11 Beschränkungen der Wirkung des Patents', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Rinken, I. (2017c) '§13 Staatliche Benutzungsanordnung', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Rinken, I. (2017d) '§14 Schutzbereich', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Rinken, I. (2017e) '§24 Zwangslizenz', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Rinken, I. (2017f) '§9 Unmittelbare Benutzung des patents', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.

Rogge, R. and Kober-Dehm, H. (2015) '§22 PatG Nichtigerklärung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.

- Rogge, R. and Melullis, K.-J. (2015) 'Einleitung PatG', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Rohrbeck, R., Hölzle, K. and Gemünden, H. (2009) 'Opening up for competitive advantage—How Deutsche Telekom creates an open innovation ecosystem', *R&D Management*, 39(4), pp. 420–430.
- Röller, J., Seidel, R. and Schlegel, R. (2018) 'Crowdsourcing', in Röller, J. (ed.) *Personalbuch 2018. Arbeitsrecht, Lohnsteuerrecht, Sozialversicherungsrecht*. 25th ed. Munich: C.H.Beck.
- Rudloff-Schäffer, C. (2017a) '§31 Akteneinsicht', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Rudloff-Schäffer, C. (2017b) '§32 OS, PS, Patentblatt, DPMA-Veröffentlichungen', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Rudolf, M. and Kuhlisch, W. (2008) *Biostatistik: Eine Einführung für Biowissenschaftler*. Munich: Pearson Studium.
- Schade, H. (1972) 'Die gemeinschaftliche und die Doppelerfindung von Arbeitnehmern', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 510–518.
- Schäfer, G. (2004) 'Achter Abschnitt. Beschlagnahme, Durchsuchung und weitere Eingriffe §99', in Rieß, P. (ed.) *Die Strafprozeßordnung und das Gerichtsverfassungsgesetz*. 25th ed. Berlin: De Gruyter Verlag.
- Schäfers, A. (2015a) '§31 Akteneinsicht', in Melullis, K.-J. (ed.) *Patentgesetz. Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015b) '§32 Veröffentlichungen des Patentamts', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015c) '§33 PatG Entschädigungsanspruch', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015d) '§34 PatG Patentanmeldung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015e) '§35a PatG Fremdsprachige Anmeldungen', in Melullis, K.-

- J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015f) '§37 PatG Erfinderbenennung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015g) '§42 PatG Offensichtlichkeitsprüfung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015h) '§48 PatG Zurückweisung der Anmeldung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. (2015i) '§50 PatG Geheimhaltungsanordnung', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. and Schwarz, H.-D. (2015a) '§59 PatG Einspruch', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schäfers, A. and Schwarz, H.-D. (2015b) '§63 PatG Nennung des Erfinders', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Scharen, U. (2015) '§9 PatG Wirkung des Patents', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Schick, C. (1984) 'Zum Erfindungsbegriff von A. Troller', *Gewerblicher Rechtsschutz und Urheberrecht Internationaler Teil*, pp. 406–409.
- Schmidt, N. (2012) 'Tagungsbericht „Open Innovation unter Wettbewerbern – Konzepte und rechtliche Rahmenbedingungen“ vom 24. Juni 2011 in Dresden', *Gewerblicher Rechtsschutz und Urheberrecht Internationaler Teil*, 1, pp. 30–31.
- Van Schooten, H. (2007) 'Law as Fact, Law as Fiction: A Tripartite Model of Legal Communication', in Wagner, A., Werner, W., and Cao, D. (eds) *Interpretation, Law and the Construction of Meaning: Collected Papers on Legal Interpretation in Theory, Adjudication and Political Practice*. Dordrecht, The Netherlands: Springer Verlag, pp. 3–20. doi: 10.1007/1-4020-5320-7_1.
- Schroeder, D. (2017) 'AEUV Art. 101 Verbot wettbewerbsbeschränkender Vereinbarungen und Verhaltensweisen', in Nettesheim, M. (ed.) *Das Recht der Europäischen Union: EUV/AEUV*. 64th ed. Munich: C.H.Beck.

- Schulte, R. (2017) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. Cologne: Carl Heymanns Verlag.
- Schultz, J. and Urban, J. M. (2012) 'Protecting Open Innovation: The Defensive Patent License as a New Approach to Patent Threats, Transaction Costs, and Tactical Disarmament', *Harvard Journal of Law and Technology*, 26(1), pp. 1–67.
- Schumpeter, J. A. (1926) *Theorie der wirtschaftlichen Entwicklung. Eine Untersuchung über Unternehmergewinn, Kapital, Kredit, Zins und den Konjunkturzyklus*. 2th ed. München/Leipzig: Duncker & Humblot.
- Schweighofer, E. (1999) *Legal Knowledge Representation. Automatic Text Analysis in Public International and European Law*. The Hague, The Netherlands: Kluwer Law International.
- Scigliano, D. (2003) *Das Management radikaler Innovationen. Eine strategische Perspektive*. Wiesbaden: Deutscher Universitäts-Verlag.
- Scotchmer, S. (1991) 'Standing on the shoulders of giants: cumulative research and the patent law', *The Journal of Economic Perspectives*, 5(1), pp. 29–41. doi: 10.1257/jep.5.1.29.
- Shapiro, C. (2002) 'Antitrust analysis of patent settlements between rivals', *Antitrust*, pp. 70–77.
- Shaw, B. (1986) 'Appropriation and transfer of innovation benefit in the U.K. medical equipment industry', *Technovation*, 4(1), pp. 45–65.
- Simeth, M. and Raffo, J. D. (2013) 'What makes companies pursue an Open Science strategy?', *Research Policy*, 42(9), pp. 1531–1543. doi: 10.1016/j.respol.2013.05.007.
- Sloane, P. (2011) 'The brave new world of open innovation', *Strategic Direction*, 27(5), pp. 3–4.
- Slocum, B. G. (2017) 'Introduction', in *The Nature of Legal Interpretation. What Jurists can learn about Legal Interpretation from Linguistics and Philosophy*. Chicago: University of Chicago Press, pp. 1–13.
- Smielick, D. (2017) '§ 49 Forschungs- und Entwicklungsverträge', in Hasselblatt, G. N. (ed.) *Münchener Anwaltshandbuch Gewerblicher Rechtsschutz*. 5th ed. Munich: C.H.Beck.
- Smith, A. (2016) *An Inquiry into the Nature and Causes of the Wealth of Nations*. Edited by A. Uyl. Woodstock, Ontario, CA: Devoted Publishing.
- Smith, P. J. (2002) 'Patentrights and trade: analysis of biological products,

medicinals and botanicals, and pharmaceuticals', *American Journal of Agricultural Economics*, 84(2), pp. 495–512.

Sonntag, M. and Kalbfus, B. (2018) 'Standardessenzielle Patente und das „Internet of Things“: Die Sicht der EU-Kommission', *Gewerblicher Rechtsschutz und Urheberrecht, Praxis im Immaterialgüterrecht und Wettbewerbsrecht*, 2, pp. 42–44.

Stadlbauer, M. and Drexler, G. (2014) 'De-Bottlenecking Open Innovation: Turning Patent-Based Technology Network Analysis into Value', in Noble, C. H., Durmusoglu, S. S., and Griffin, A. (eds) *Open Innovation: New product Development Essentials from the PDMA*. Hoboken, NJ, USA: John Wiley & Sons, pp. 3–26. doi: 10.1002/9781118947166.ch1.

Stauder, D. (2016a) 'Art. 14 Sprachen des EPA', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.

Stauder, D. (2016b) 'Art. 55 Unschädliche Offenbarungen', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.

Stavenhagen, G. (1969) *Geschichte der Wirtschaftstheorie*. 4th ed. Göttingen: Vandenhoeck & Ruprecht.

Storz, U. and Hüttermann, A. (2012) 'Nicht Erschießen, sondern Erhängen - Zur stetig zunehmenden Rolle der erfinderischen Tätigkeit bei der Beurteilung der Schutzfähigkeit von Patenten', *Mitteilungen der deutschen Patentanwälte*, 103(3), pp. 107–110.

Sunstein, C. R. (2018) *Legal Reasoning and Political Conflict*. 2nd ed. Oxford: Oxford University Press.

Swan, M. (2015) *Blockchain. Blueprint for a new economy*. Sebastopol, Canada: O'Reilly Media, Inc.

Sweeny, A. (2009) *BlackBerry Planet. The story of Research In Motion and the little device that took the world by storm*. Mississauga, Ontario, Canada: John Wiley & Sons.

Tandon, P. (1982) 'Optimal patents with compulsory licensing', *The Journal of Political Economy*, 90(3), pp. 470–486.

Teirlinck, P., Dumont, M. and Spithoven, A. (2010) 'Corporate decision-making in R&D outsourcing and the impact on internal R&D employment intensity', *Industrial and Corporate Change*, 19(6), pp. 1741–1768.

Teschmacher, R. (2016a) 'Art. 80 Anmeldetag', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.

- Teschmacher, R. (2016b) 'Art. 81 Erfindernennung', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- Teschmacher, R. (2016c) 'Art. 83 Offenbarung der Erfindung', in Stauder, D. and Luginbühl, S. (eds) *Europäisches Patentübereinkommen*. 7th ed. Cologne: Carl Heymanns Verlag.
- The Economist (2015) *Blockchain. The next big thing*, *The Economic Journal*. Available at: <https://www.economist.com/news/special-report/21650295-or-it-next-big-thing> (Accessed: 30 May 2018).
- Theis, F.-J. (1994) *Gesellschaftsrecht*. Wiesbaden: Springer Fachmedien.
- Thiele, A. R., Blakeway, J. R. and Hosch, C. M. (2010) *The patent infringement litigation handbook. Avoidance and Management*. Chicago, Illinois, USA: American Bar Association.
- Timmann, T. (2008) *Das Patentrecht im Lichte von Art. 14 GG*. Tübingen: Mohr Siebeck.
- Tochtermann, P. (2016) '§40 Innere Priorität', in Keukenschrijver, A. (ed.) *Patentgesetz unter Berücksichtigung des Europäischen Patentübereinkommens, der Regelungen zum Patent mit einheitlicher Wirkung und des Patentszusammenarbeitsvertrags mit Patentkostengesetz, Gebrauchsmustergesetz und Gesetz über den Schutz der Topographien*. 8th ed. Berlin/Boston: De Gruyter Verlag.
- Todorova, G. and Durisin, B. (2007) 'Absorptive capacity: valuing a reconceptualization', *Academy of Management Review*, 32(3), pp. 774–786.
- Uffmann, K. (2016) 'Digitalisierung der Arbeitswelt. Wie gestalten wir die notwendigen Veränderungen?', *NZA*, pp. 977–984.
- Ulich, E. and Wülser, M. (2012) *Gesundheitsmanagement in Unternehmen. Arbeitspsychologische Perspektiven*. 5th ed. Wiesbaden: Springer Gabler Verlag.
- Ullmann, E. and Deichfuß, H. (2015) 'PatG §15 Übertragbarkeit des Rechts; Lizenzen', in Melullis, K.-J. (ed.) *Patentgesetz, Gebrauchsmustergesetz, Patentkostengesetz*. 11th ed. Munich: C.H.Beck.
- Ullrich, H. (2007) 'Patente, Wettbewerb und technische Normen: Rechts- und ordnungspolitische Fragestellungen', *Gewerblicher Rechtsschutz und Urheberrecht*, 10(10), pp. 817–830.
- Urabe, K. (1988) 'Innovation and the Japanese Management System', in Urabe, K., Child, J., and Kagono, T. (eds) *Innovation and Management. International Comparisons*.

- Vanneste, S., Hiel, A. Van, Parisi, F. and Depoorter, B. (2006) 'From "tragedy" to "disaster": Welfare effects of commons and anticommons dilemmas', *International Review of Law and Economics*, 26(1), pp. 104–122.
- Verbeure, B., van Zimmeren, E., Matthijs, G. and van Overwalle, G. (2006) 'Patent pools and diagnostic testing', *Trends in Biotechnology*, 24(3), pp. 115–120.
- Visser, D. (2017) *The annotated European Patent Convention*. 25th ed. Alphen aan den Rijn, The Netherlands: Wolters Kluwer.
- Voß, D. (2017) '§139 Patentverletzungen', in Schulte, R. (ed.) *Patentgesetz mit Europäischem Patentübereinkommen. Kommentar auf der Grundlage der deutschen und europäischen Rechtsprechung*. 10th ed. Cologne: Carl Heymanns Verlag.
- Weigand, C. (2006) *Statistik mit und ohne Zufall: Eine anwendungsorientierte Einführung*. Heidelberg: Physica-Verlag.
- Weiß, W. (2016a) 'AEUV Art. 101 (ex-Art. 81 EGV) [Verbot wettbewerbsbeschränkender Maßnahmen]', in Calliess, C. and Ruffert, M. (eds) *EUV/AEUV mit Europäischer Grundrechtecharta*. 5th ed. Munich: C.H.Beck.
- Weiß, W. (2016b) 'AEUV Art. 102 (ex-Art. 82 EGV) [Mißbrauch marktbeherrschender Stellung]', in Calliess, C. and Ruffert, M. (eds) *EUV/AEUV mit Europäischer Grundrechtecharta*. 5th ed. Munich: C.H.Beck.
- Weisse, R. (2014) *Erfindungen, Patente, Lizenzen. Ratgeber für die Praxis*. 4th ed. Berlin/Heidelberg: Springer Vieweg Verlag.
- Weisser, J. (2017) 'Patentrechtliche und kartellrechtliche Zwangslizenz – Unterschiede und Gemeinsamkeiten – „Isentress“', *Gesellschafts- und Wirtschaftsrecht*, 7, pp. 134–136.
- Wenjuan, T. and Lei, Z. (2010) 'Intellectual Property Management Strategies of Enterprises Based on Open Innovation Model', in Mingran, D., Jianmu, Y., Kaminishi, K., Duysters, G., and de Hoyos, A. (eds) *Proceedings of the 7th International Conference on Innovation & Management*, pp. 1378–1383.
- West, J. and Gallagher, S. (2006) 'Challenges of open innovation: the paradox of firm investment in open-source software', *R&D Management*, 36(3), pp. 319–331.
- Wiebe, A. (2004) 'Patentschutz und Softwareentwicklung - ein unüberbrückbarer Gegensatz?', in Gehring, R. A. and Lutterbeck, B. (eds) *Open Source Jahrbuch 2004 – Zwischen Softwareentwicklung und Gesellschaftsmodell*, pp. 277–292.
- Wilson, S. (2009) 'The open-minded Professor', *Deloitte Review*, 4.
- Windisch, E. (1980) 'Beziehungen zwischen Urheber-, Erfinder-, Programmier- und Tonaufnahme-Leistungen', *Gewerblicher Rechtsschutz und Urheberrecht*, 6, pp.

587–592.

Winkler, H. (1958) 'Zur Definition der Erfindungshöhe', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 153–155.

Wollschläger, D. (2017) *Grundlagen der Datenanalyse mit R. Eine anwendungsorientierte Einführung*. 4th ed. Berlin/Heidelberg: Springer Spektrum.

Wunderlich, D. (1962) *Die gemeinschaftliche Erfindung*. Cologne: Carl Heymanns Verlag.

Zahra, S. and George, G. (2002) 'Absorptive capacity: A review, reconceptualization, and extension', *Academy of Management Review*, 27(2).

van Zimmeren, E., Vanneste, S., Matthijs, G., Vanhaverbeke, W. and van Overwalle, G. (2011) 'Patent pools and clearinghouses in the life sciences', *Trends in Biotechnology*, 29(11), pp. 569–576.

LIST OF LEGAL TEXTS

BGB

Civil Code in the version promulgated on 2 January 2002 (BGBl. I p. 42, 2909; 2003 I p. 738), last amended by article 4(5) of the Act of 1 October 2013 (BGBl. I p. 3719).

EPC

Convention on the grant of European Patents (European Patent Convention) of 5 October 1973 as revised by the act revising article 63 EPC of 17 December 1991 and the act revising the EPC of 29 November 2000.

GebrMG

Utility Model Act in the version published on 28 August 1986 (BGBl. I p. 1455), as last amended by article 10 of the act of 17 July 2017 (BGBl. I p. 2541).

GEIA

Act on Employee Inventions in the adjusted version published in the Federal Law Gazette Part III, structure number 422-1, which was last amended by article 7 of the act of 31 July 2009 (BGBl. I p. 2521).

GWB

Act against Restraints of Competition in the version published on 26 June 2013 (BGBl. I, 2013, pp. 1750, 3245), as last amended by article 1 of the act of 1 June 2017 (BGBl. I p. 1416).

PatG

Patent Act as published on 16 December 1980 (BGBl. 1981 I p.1), as last amended by article 3 of the act of 1 September 2017 (BGBl. I p. 3346).

R&D-BER (R&D Block Exemption Regulation)

Commission regulation (EU) No. 1217/2010 of 14 December 2010 on the application of article 101(3) of the Treaty on the Functioning of the European Union to certain categories of research and development agreements.

TFEU

Treaty on the Functioning of the European Union as consolidated version (OJ EU No. C 326, 26.10.2012, p.47) based on the Treaty of Lisbon, which entered into force on 1.12.2009 (Consolidated version published in OJ EU No. C 115, 9.5.2008, p. 47), as amended by the act concerning the conditions of accession of

the Republic of Croatia and the adjustments to the Treaty on European Union, the Treaty on the Functioning of the European Union and the Treaty establishing the European Atomic Energy Community (OJ EU L 112/21, 24.4.2012) as amended on 1.7.2013.

TT-BER (Technology Transfer Block Exemption Regulation)

Commission regulation (EU) No. 316/2014 of 21 March 2014 on the application of article 101(3) of the Treaty on the Functioning of the European Union to categories of technology transfer agreements.

LIST OF CASE LAW

The table gives the number of the decisions and the date the decision was taken. If the decision was published the journal is given. In this case, this publication is also listed in the references.

DECISIONS OF THE FEDERAL SUPREME COURT (BGH)

- (1955) '16.11.1954 - I ZR 40/53', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 286–292.
- (1958) '21.03.1958 - I ZR 160/57 "Wettschein"', *Gewerblicher Rechtsschutz und Urheberrecht*, 12, pp. 602–603.
- (1962) '08.06.1962 - I ZR 9/61 "Blitzlichtgerät"', *Gewerblicher Rechtsschutz und Urheberrecht*, 10, pp. 518–522.
- (1963) '22.01.1963 - Ia ZR 60/63 "Stapelpresse"', *Gewerblicher Rechtsschutz und Urheberrecht*, 6, pp. 311–314.
- (1966) '05.05.1966 - Ia ZR 110/64 „Spanplatten“', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 558–561.
- (1966) '25.11.1965 - Ia ZR 117/64 "Pfennigabsatz"', *Gewerblicher Rechtsschutz und Urheberrecht*, 9, pp. 484–488.
- (1969) '27.03.1969 „Rote Taube“', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 672–676.
- (1977) '01.07.1976 - X ZB 10/74 "Kennungsscheibe"', *Gewerblicher Rechtsschutz und Urheberrecht*, 3, pp. 152–154.
- (1978) '07.06.1977 - X ZB 20/74 "Prüfverfahren"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 102–105.
- (1978) '13.12.1977 - X ZR 28/75 „Hydraulischer Kettenbandantrieb“', *Gewerblicher Rechtsschutz und Urheberrecht*, 5, p. 297-300.
- (1979) '06.03.1979 - X ZR 60/77 „Widerrechtliche Entnahme eines Teils der Patentanmeldung - Spinnmaschine“', *Neue Juristische Wochenschrift*, 43, pp. 2210–2211.
- (1980) '13.05.1980 - X ZB 19/78 "Antiblockiersystem"', *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 849–852.

(1986) '11.03.1986 - X ZR 65/85 "Flugkostenminimierung", *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 531–535.

(1993) '09.02.1993 - X ZB 7/92 "Preprint-Versendung", *Gewerblicher Rechtsschutz und Urheberrecht*, 5, pp. 466–469.

(1996) '11.07.1995 - X ZR 99/92 "Klinische Versuche", *Gewerblicher Rechtsschutz und Urheberrecht*, 2, pp. 109–121.

(1997) '17.04.1997 - X ZR 68/94 „Patentrechtliches Versuchsprivileg – Klinische Versuche II“, *Neue Juristische Wochenschrift*, 46, pp. 3092–3096.

(1999) '10.11.1998 - X ZR 137/94 „Öffentliche Zugänglichkeit einer Erfindung während Entwicklungs- und Erprobungsphase – Herzklappenprothese“, *Neue Juristische Wochenschrift*, 12, pp. 834–836.

(2004) '16.09.2003 - X ZR 142/01 „Tatrichterliche Feststellungen zur Miterfindereigenschaft“, *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 50–52.

(2005) '22.03.2005 - X ZR 152/03 „Gummielastische Masse II“, *Gewerblicher Rechtsschutz und Urheberrecht*, pp. 663–665.

(2009) '12.03.2009 - Xa ZR 86/06 „Mitberechtigung trotz Teilbarkeit der Patentanmeldung – Blendschutzbehang“, *Gewerblicher Rechtsschutz und Urheberrecht*, 7, pp. 657–659.

DECISION OF THE OLG DÜSSELDORF

(1971) '30.10.1970 - 2 U 68/69 "Einsackwaage", *Gewerblicher Rechtsschutz und Urheberrecht*, 5, pp. 215–218.

DECISION OF THE ENLARGED BOARD OF APPEAL OF EPO

G1/92 dated 18 December 1992; Official Journal of EPO 1993, 277

DECISIONS OF THE TECHNICAL BOARDS OF APPEAL OF EPO

T4/83 dated 16 March 1983, Official Journal of EPO 1983, 498

T14/83 dated 7 June 1983, Official Journal of EPO 1984, 105

T144/83 dated 27 March 1986, Official Journal of EPO 1986, 301

T173/83 dated 1 July 1985, Official Journal of EPO 1987, 465

T381/87 dated 10 November 1988, Official Journal of EPO 1990, 213

- T153/88 dated 9 January 1991
- T444/88 dated 9 May 1990
- T482/89 dated 11 December 1990, Official Journal of EPO 1992, 646
- T59/90 dated 12 March 1993
- T830/90 dated 23 July 1993, Official Journal of EPO 1994, 713
- T877/90 dated 28 July 1992, Special Edition of Official Journal of EPO 1993, 17
- T602/91 dated 13 September 1994
- T634/91 dated 31 May 1994
- T472/92 dated 20 November 1996, Official Journal of EPO 1998, 161
- T585/92 dated 9 February 1995, Official Journal of EPO 1996, 129
- T739/92 dated 16 July 1996
- T782/92 dated 22 June 1994, Special Edition of Official Journal of EPO 1995, 28
- T952/92 dated 17 August 1994, Official Journal of EPO 1995, 755
- T1054/92 dated 20 June 1996, Special Edition of Official Journal of EPO 1998, 17, 53
- T74/93 dated 9 November 1994, Official Journal of EPO 1995, 712
- T292/93 dated 13 February 1997
- T823/93 dated 25 June 1996
- T97/94, dated 15 July 1997, Official Journal of EPO 1998, 467
- T348/94 dated 21 October 1998
- T750/94 dated 1 April 1997, Official Journal of EPO 1998, 32
- T86/95 dated 9 September 1997, Special Edition of Official Journal of EPO 1998, 16

T809/95 dated 29 April 1997

T901/95 dated 29 October 1998

T931/95 dated 8 September 2000, Official Journal of EPO 2001, 441

T37/96 dated 7 February 2000

T165/96 dated 30 May 2000

T838/97 dated 14 November 2000

T1212/97 dated 14 May 2001

T314/99 dated 21 June 2001, Special Edition of Official Journal of EPO 2002, 17

T478/99 dated 7 December 2000

T947/99 dated 27 November 2003

T1022/99 dated 10 April 2001, Special Edition of Official Journal of EPO 2002, 19

T50/02 dated 29 June 2004

T258/03 dated 21 April 2004, Official Journal of EPO 2004, 575

T1464/05 dated 14 May 2009

T1134/06 dated 16 January 2007, Special Edition of Official Journal of EPO 2007, No. 6, p. 20, 52

T1553/06 dated 12 March 2012

T1829/06, dated 10 November 2009

T1875/06 dated 8 January 2008

T336/07 dated 11 October 2007, Special edition of Official Journal of EPO 2008, 18

T1309/07 dated 23 June 2009

T2/09 dated 12 March 2012


T990/09 dated 3 July 2012

T1168/09 dated 15 October 2010

T2339/09 dated 17 November 2011

T286/10 dated 21 May 2014

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2	<input type="checkbox"/>	EP000001113463B1	27.12.2000	H01F 21/12	LUDORF WERNER DR, AT	TRIDONICATCO GMBH & CO KG, AT
3	<input type="checkbox"/>	WO002001051775A2	23.12.2000	F01L 9/00	BURGDORF JOCHEN, DE; GIERS BERNHARD, DE; VOLZ PETER, DE	BURGDORF JOCHEN, DE; CONTINENTAL TEV VOLZ PETER, DE



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1	<input type="checkbox"/>	WO002016128099A1	30.12.2015	F04D 17/16	GEBERT DANIEL, DE; KONZAL ALEXANDER, DE; MUELLER JENS, DE; STREHLE MICHAEL, DE	EBM-PAPST MULFINGEN GMBH
2	<input type="checkbox"/>	WO002016102643A1	23.12.2015	B23B 41/12	MAURER EUGEN, DE	JAKOB LACH GMBH & CO KG
3	<input type="checkbox"/>	WO002016102600A1	22.12.2015	A01B 23/02	KRÄMER ULRICH, DE; SEIFRIED FABIAN, DE; SMEETS FLORIAN, DE	BETEK GMBH & CO KG , DE

DATA 2000

Nummer	Tag	Monat	firm-to-firm OI	OI with-an-external-invent	Closed Innovation	firm-to-firm OI with-an-external-invent	Summe	Group 1	Group 2
1	21	1	0	8	29	0	37	29	8
2	27	2	0	0	0	0	0	0	0
3	28	3	0	4	20	0	24	20	4
4	11	3	1	4	15	0	20	16	4
5	17	3	1	4	28	0	33	29	4
6	18	3	0	2	17	0	19	17	2
7	20	3	0	0	16	0	16	16	0
8	27	4	1	6	27	0	34	28	6
9	5	4	0	9	24	0	33	24	9
10	7	5	0	0	0	0	0	0	0
11	11	5	0	5	25	2	32	25	7
12	22	5	0	2	7	0	9	7	2
13	6	6	0	2	26	0	28	26	2
14	14	6	0	3	18	0	21	18	3
15	10	7	0	6	11	0	17	11	6
16	21	7	2	4	37	1	44	39	5
17	22	7	0	1	22	1	24	22	2
18	1	8	3	3	30	1	37	33	4
19	4	8	1	3	24	0	28	25	3
20	21	8	0	0	11	0	11	11	0
21	7	9	0	4	25	0	29	25	4
22	11	9	0	1	8	0	9	8	1
23	25	9	0	0	16	0	16	16	0
24	28	9	1	3	24	0	28	25	3
25	29	9	0	7	26	0	33	26	7
26	14	10	0	3	9	1	13	9	4
27	27	10	0	4	23	0	27	23	4
28	9	11	0	4	15	0	19	15	4
29	13	11	0	3	25	0	28	25	3
30	17	11	0	7	30	0	37	30	7
31	21	11	0	3	26	0	29	26	3
32	9	12	1	2	16	0	19	17	2
33	16	12	0	2	19	0	21	19	2
34	17	12	0	0	0	0	0	0	0
35	25	12	0	0	0	0	0	0	0
Summe			11	109	649	6	775	660	115

DATA 2015

Nummer	Tsg	Monat	firm-to-firm OI	OI with-an-external-inventor	Closed Innovation	firm-to-firm OI with-an-external-inventor	Summe	Group 1	Group 2
1	4	1	0	0	0	0	0	0	0
2	20	1	0	6	10	0	16	10	6
3	21	1	0	3	14	0	17	14	3
4	11	2	0	3	12	0	15	12	3
5	15	2	0	0	0	0	0	0	0
6	17	2	0	2	13	0	15	13	2
7	26	2	0	2	20	0	22	20	2
8	14	3	0	1	2	0	3	2	1
9	15	3	0	0	0	0	0	0	0
10	17	3	1	5	14	0	20	15	5
11	30	3	0	2	18	0	20	18	2
12	31	3	0	0	20	0	20	20	0
13	14	4	0	0	11	0	11	11	0
14	22	4	0	0	23	0	23	23	0
15	24	4	0	2	8	0	10	8	2
16	26	4	0	0	0	0	0	0	0
17	3	5	0	0	0	0	0	0	0
18	4	5	0	1	19	0	20	19	1
19	31	5	0	0	0	0	0	0	0
20	14	6	0	0	0	0	0	0	0
21	18	6	0	3	9	0	12	9	3
22	27	6	0	0	1	0	1	1	0
23	30	6	1	1	12	0	14	13	1
24	1	7	0	3	17	0	20	17	3
25	5	7	0	0	0	0	0	0	0
26	20	7	0	4	9	0	13	9	4
27	24	7	0	1	8	0	9	8	1
28	1	8	0	0	6	0	6	6	0
29	6	8	1	1	18	0	20	19	1
30	25	8	1	2	11	0	14	12	2
31	13	10	1	0	25	0	26	26	0
32	14	9	0	1	8	0	9	8	1
33	11	10	0	0	0	0	0	0	0
34	15	10	0	2	11	0	13	11	2
35	22	10	0	2	14	0	16	14	2
36	2	11	0	1	26	0	27	26	1
37	4	11	0	1	19	0	20	19	1
38	11	11	0	1	18	0	19	18	1
39	20	11	0	2	13	0	15	13	2
40	17	12	1	5	24	0	30	25	5
41	27	12	0	0	0	0	0	0	0
Summe			6	57	433	0	436	433	57

LEVENE-TEST TO CHECK THE VARIANCES

For all Levene-tests the level of α is set at 5%. If the p-value is above $\alpha=0.05$, the null hypothesis of equal variances can be retained and the t-test with equal variances is applied. Otherwise the Welch two-sample t-test is used. The Levene-test is applied with the median as center to make the test more robust. Therefore, the correct name for this test is Brown-Forsythe test for homogeneity of variance. The calculations were carried out with the statistics program R.

(CI: 2000) versus (CI: 2015)

```
> with(Dataset, tapply(Closed.Innovation, id, var, na.rm=TRUE))
```

```
  0    1
92.96134 67.20244
```

```
> leveneTest(Closed.Innovation ~ id, data=Dataset, center="median")
```

Levene's Test for Homogeneity of Variance (center = "median")

```
  Df F value Pr(>F)
group 1  0.7577 0.3869
  74
```

Due to the p-value of 0.3869, which is above $\alpha=0.05$, the t-test with equal variances is applied.

(OI with-an-external-inventor: 2000) versus (OI with-an-external-inventor: 2015)

```
> with(Dataset, tapply(OI.with.an.external.inventor, id, var, na.rm=TRUE))
```

```
  0    1
5.810084 2.493902
```

```
> leveneTest(OI.with.an.external.inventor ~ id, data=Dataset, center="median")
```

Levene's Test for Homogeneity of Variance (center = "median")

```
  Df F value Pr(>F)
group 1  4.6236 0.0348 *
  74
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 0.0348, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

```

(firm-to-firm OI: 2000) versus (firm-to-firm OI: 2015)
> with(Dataset, tapply(firm.to.firm.OI, id, var, na.rm=TRUE))
      0      1
0.4571429 0.1280488

> leveneTest(firm.to.firm.OI ~ id, data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value Pr(>F)
group 1  1.9071 0.1714
      74

```

Due to the p-value of 0.1714, which is above $\alpha=0.05$, the t-test with equal variances is applied.

```

(firm-to-firm OI with-an-external-inventor: 2000) versus (firm-to-firm OI with-
an-external-inventor: 2015)
> with(Dataset,
+
tapply(X.firm.to.firm.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.
with.an.external.inventor.2015.,
+ id, var, na.rm=TRUE))
      0      1
0.205042 0.000000

>
leveneTest(X.firm.to.firm.OI.with.an.external.inventor.2000..versus..firm.to.firm.
OI.with.an.external.inventor.2015.
+ ~ id, data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value Pr(>F)
group 1  5.89 0.01766 *
      74
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Due to the p-value of 0.01766, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(CI: 2000) versus (OI with-an-external-inventor: 2000)

```
> with(Dataset, tapply(X.CI.2000..versus..OI.with.an.external.inventor.2000., id,
+ var, na.rm=TRUE))
  0    1
92.961345 5.810084
```

```
> leveneTest(X.CI.2000..versus..OI.with.an.external.inventor.2000. ~ id,
+ data=Dataset, center="median")
```

Levene's Test for Homogeneity of Variance (center = "median")

```
  Df F value  Pr(>F)
group 1 35.761 9.214e-08 ***
  68
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 9.214e-08, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(CI: 2000) versus (firm-to-firm OI: 2000)

```
> with(Dataset, tapply(X.CI.2000..versus..firm.to.firm.OI.2000., id, var,
+ na.rm=TRUE))
  0    1
92.9613445 0.4571429
```

```
> leveneTest(X.CI.2000..versus..firm.to.firm.OI.2000. ~ id, data=Dataset,
+ center="median")
```

Levene's Test for Homogeneity of Variance (center = "median")

```
  Df F value  Pr(>F)
group 1 59.477 7.301e-11 ***
  68
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 7.301e-11, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(CI: 2000) versus (firm-to-firm OI with-an-external-inventor: 2000)

```
> with(Dataset,
+ tapply(X.CI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000., id,
var,
```

```

+ na.rm=TRUE))
  0    1
92.961345 0.205042

> leveneTest(X.CI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000. ~
id,
+ data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value  Pr(>F)
group 1 62.245 3.478e-11 ***
  68
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Due to the p-value of 3.478e-11, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(OI with-an-external-inventor: 2000) versus (firm-to-firm OI: 2000)

```

> with(Dataset,
+ tapply(X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.2000., id,
var,
+ na.rm=TRUE))
  0    1
5.8100840 0.4571429

> leveneTest(X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.2000. ~
id,
+ data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value  Pr(>F)
group 1 28.273 1.266e-06 ***
  68
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

Due to the p-value of 1.266e-06, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(OI with-an-external-inventor: 2000) versus (firm-to-firm OI with-an-external-inventor: 2000)

```
> with(Dataset,
+
+ tapply(X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000.,
+ id, var, na.rm=TRUE))
  0  1
5.810084 0.205042
```

```
>
leveneTest(X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000.
```

```
+ ~ id, data=Dataset, center="median")
```

Levene's Test for Homogeneity of Variance (center = "median")

```
  Df F value  Pr(>F)
group 1 37.159 5.778e-08 ***
  68
```

```
---
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 5.778e-08, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(firm-to-firm OI: 2000) versus (firm-to-firm OI with-an-external-inventor: 2000)

```
> with(Dataset,
+
+ tapply(X.firm.to.firm.OI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000.,
+ id, var, na.rm=TRUE))
  0  1
0.4571429 0.2050420
```

```
>
leveneTest(X.firm.to.firm.OI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000.
```

```
+ ~ id, data=Dataset, center="median")
```

Levene's Test for Homogeneity of Variance (center = "median")

```

  Df F value Pr(>F)
group 1 1.0787 0.3027
      68

```

Due to the p-value of 0.3027, which is above $\alpha=0.05$, the t-test with equal variances is applied.

(CI: 2015) versus (OI with-an-external-inventor: 2015)

```

> with(Dataset, tapply(X.CI.2015..versus..OI.with.an.external.inventor.2015., id,
+ var, na.rm=TRUE))
  0    1
67.202439 2.493902

```

```

> leveneTest(X.CI.2015..versus..OI.with.an.external.inventor.2015. ~ id,
+ data=Dataset, center="median")

```

Levene's Test for Homogeneity of Variance (center = "median")

```

  Df F value Pr(>F)
group 1 59.953 2.574e-11 ***
      80

```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 2.574e-11, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(CI: 2015) versus (firm-to-firm OI: 2015)

```

> with(Dataset, tapply(X.CI.2015..versus..firm.to.firm.OI.2015., id, var,
+ na.rm=TRUE))
  0    1
67.2024390 0.1280488

```

```

> leveneTest(X.CI.2015..versus..firm.to.firm.OI.2015. ~ id, data=Dataset,
+ center="median")

```

Levene's Test for Homogeneity of Variance (center = "median")

```

  Df F value Pr(>F)
group 1 88.439 1.413e-14 ***
      80

```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of $1.413e-14$, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(CI: 2015) versus (firm-to-firm OI with-an-external-inventor: 2015)

```
> with(Dataset,
+   tapply(X.CI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015., id,
+   var,
+   na.rm=TRUE))
      0      1
67.20244 0.00000
```

```
> leveneTest(X.CI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015. ~
id,
+ data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value Pr(>F)
group 1 92.968 4.835e-15 ***
      80
```

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Due to the p-value of $4.835e-15$, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(OI with-an-external-inventor: 2015) versus (firm-to-firm OI: 2015)

```
> with(Dataset,
+   tapply(X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.2015., id,
+   var,
+   na.rm=TRUE))
      0      1
2.4939024 0.1280488
```

```
> leveneTest(X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.2015. ~
id,
+ data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value Pr(>F)
group 1 31.332 2.955e-07 ***
      80
```

```
---
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 2.955e-07, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(OI with-an-external-inventor: 2015) versus (firm-to-firm OI with-an-external-inventor: 2015)

```
> with(Dataset,
+
+ tapply(X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015.,
+ id, var, na.rm=TRUE))
  0  1
2.493902 0.000000
```

```
>
+ leveneTest(X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015.
+ ~ id, data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value Pr(>F)
group 1 45.132 2.457e-09 ***
      80
```

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 2.457e-09, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(firm-to-firm OI: 2015) versus (firm-to-firm OI with-an-external-inventor: 2015)

```
> with(Dataset,
+
+ tapply(X.firm.to.firm.OI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015.,
+ id, var, na.rm=TRUE))
  0  1
0.1280488 0.0000000
```

```
>
+ leveneTest(X.firm.to.firm.OI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015.
```

```
+ ~ id, data=Dataset, center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value Pr(>F)
group 1 6.8571 0.01056 *
      80
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Due to the p-value of 0.01056, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(Group 1: CI and firm-to-firm OI: 2000) versus (Group 2: OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor: 2000)

```
> with(Dataset, tapply(X.group.1.2000..versus..group.2.2000., id, var,
na.rm=TRUE))
  0  1
98.949580 6.151261
```

```
> leveneTest(X.group.1.2000..versus..group.2.2000. ~ id, data=Dataset,
+ center="median")
Levene's Test for Homogeneity of Variance (center = "median")
  Df F value Pr(>F)
group 1 34.931 1.219e-07 ***
      68
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Due to the p-value of 1.219e-07, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

(Group 1: CI and firm-to-firm OI: 2015) versus (Group 2: OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor: 2015)

```
> with(Dataset, tapply(X.group.1.2015..versus..group.2.2015., id, var,
na.rm=TRUE))
  0  1
69.362195 2.493902
```

```
> leveneTest(X.group.1.2015..versus..group.2.2015. ~ id, data=Dataset,
+ center="median")
```

Levene's Test for Homogeneity of Variance (center = "median")

	Df	F value	Pr(>F)	
group 1	63.14	1.031e-11	***	
	80			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Due to the p-value of 1.031e-11, which is not above $\alpha=0.05$, the Welch two sample t-test is applied.

T-TEST

For all t-tests, the level of α is set at 5%. The calculations were carried out with the statistics program R.

(CI: 2000) versus (CI: 2015)

```
> t.test(Closed.Innovation~id, alternative='greater', conf.level=.95,  
var.equal=TRUE,  
+ data=Dataset)
```

Two Sample t-test

```
data: Closed.Innovation by id  
t = 3.9013, df = 74, p-value = 0.0001045  
alternative hypothesis: true difference in means is greater than 0  
95 percent confidence interval:  
4.573907 Inf  
sample estimates:  
mean in group 0 mean in group 1  
18.54286 10.56098
```

The probability of the statement average value (CI: 2000) \leq average value (CI: 2015) has the p-value = 0.0001045, which is under $\alpha=0,05$. Therefore, the statement average value (CI: 2000) $>$ average value (CI: 2015) is significant.

(OI with-an-external-inventor: 2000) versus (OI with-an-external-inventor: 2015)

```
> t.test(OI.with.an.external.inventor~id, alternative='greater', conf.level=.95,  
+ var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data: OI.with.an.external.inventor by id  
t = 3.6199, df = 56.979, p-value = 0.0003137  
alternative hypothesis: true difference in means is greater than 0  
95 percent confidence interval:  
0.9277065 Inf  
sample estimates:  
mean in group 0 mean in group 1  
3.114286 1.390244
```

The probability of the statement average value (OI with-an-external-inventor: 2000) \leq average value (OI with-an-external-inventor: 2015) has the p-value = 0.0003137, which is under $\alpha=0,05$. Therefore, the statement average value (OI with-an-external-inventor: 2000) $>$ average value (OI with-an-external-inventor: 2015) is significant.

(firm-to-firm OI: 2000) versus (firm-to-firm OI: 2015)

```
> t.test(firm.to.firm.OI~id, alternative='greater', conf.level=.95, var.equal=TRUE,
+ data=Dataset)
```

Two Sample t-test

```
data: firm.to.firm.OI by id
t = 1.381, df = 74, p-value = 0.08572
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
-0.03462768      Inf
sample estimates:
mean in group 0 mean in group 1
  0.3142857    0.1463415
```

The probability of the statement average value (firm-to-firm OI: 2000) \leq average value (firm-to-firm OI: 2015) has the p-value = 0.08572, which is not under $\alpha=0,05$. Therefore, there is no significant statement.

(firm-to-firm OI with-an-external-inventor: 2000) versus (firm-to-firm OI with-an-external-inventor: 2015)

```
>
t.test(X.firm.to.firm.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.wi
th.an.external.inventor.2015.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data:
X.firm.to.firm.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.with.an.
external.inventor.2015. by id
t = 2.2397, df = 34, p-value = 0.01588
alternative hypothesis: true difference in means is greater than 0
```

95 percent confidence interval:

0.04200554 Inf

sample estimates:

mean in group 0 mean in group 1

0.1714286 0.0000000

The probability of the statement average value (firm-to-firm OI with-an-external-inventor: 2000) \leq average value (firm-to-firm OI with-an-external-inventor: 2015) has the p-value = 0.01588, which is under $\alpha=0,05$. Therefore, the statement average value (firm-to-firm OI with-an-external-inventor: 2000) $>$ average value (firm-to-firm OI with-an-external-inventor: 2015) is significant.

(CI: 2000) versus (OI with-an-external-inventor: 2000)

```
> t.test(X.CI.2000..versus..OI.with.an.external.inventor.2000.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

data: X.CI.2000..versus..OI.with.an.external.inventor.2000. by id

t = 9.1843, df = 38.233, p-value = 1.623e-11

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

12.59678 Inf

sample estimates:

mean in group 0 mean in group 1

18.542857 3.114286

The probability of the statement average value (CI: 2000) \leq average value (OI with-an-external-inventor: 2000) has the p-value = 1.623e-11, which is under $\alpha=0,05$. Therefore, the statement average value (CI: 2000) $>$ average value (OI with-an-external-inventor: 2000) is significant.

(CI: 2000) versus (firm-to-firm OI: 2000)

```
> t.test(X.CI.2000..versus..firm.to.firm.OI.2000.~id, alternative='greater',
+ conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

data: X.CI.2000..versus..firm.to.firm.OI.2000. by id

t = 11.158, df = 34.334, p-value = 2.884e-13

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

15.4668 Inf

sample estimates:

mean in group 0 mean in group 1

18.5428571 0.3142857

The probability of the statement average value (CI: 2000) \leq average value (firm-to-firm OI: 2000) has the p-value = 2.884e-13, which is under $\alpha=0,05$. Therefore, the statement average value (CI: 2000) $>$ average value (firm-to-firm OI: 2000) is significant.

(CI: 2000) versus (firm-to-firm OI with-an-external-inventor: 2000)

```
> t.test(X.CI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

data: X.CI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000. by id

t = 11.26, df = 34.15, p-value = 2.418e-13

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

15.61297 Inf

sample estimates:

mean in group 0 mean in group 1

18.5428571 0.1714286

The probability of the statement average value (CI: 2000) \leq average value (firm-to-firm OI with-an-external-inventor: 2000) has the p-value = 2.418e-13, which is under $\alpha=0,05$. Therefore, the statement average value (CI: 2000) $>$ average value (firm-to-firm OI with-an-external-inventor: 2000) is significant.

(OI with-an-external-inventor: 2000) versus (firm-to-firm OI: 2000)

```
> t.test(X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.2000.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

data: X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.2000. by id

t = 6.6169, df = 39.317, p-value = 3.48e-08

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

2.08717 Inf

sample estimates:

mean in group 0 mean in group 1

3.1142857 0.3142857

The probability of the statement average value (OI with-an-external-inventor: 2000) \leq average value (firm-to-firm OI: 2000) has the p-value = 3.48e-08, which is under $\alpha=0,05$. Therefore, the statement average value (OI with-an-external-inventor: 2000) $>$ average value (firm-to-firm OI: 2000) is significant.

(OI with-an-external-inventor: 2000) versus (firm-to-firm OI with-an-external-inventor: 2000)

>

t.test(X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000.~id,

+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)

Welch Two Sample t-test

data:

X.OI.with.an.external.inventor.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000. by id

t = 7.0987, df = 36.397, p-value = 1.147e-08

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

2.243156 Inf

sample estimates:

mean in group 0 mean in group 1

3.1142857 0.1714286

The probability of the statement average value (OI with-an-external-inventor: 2000) \leq average value (firm-to-firm OI with-an-external-inventor: 2000) has the p-value = 1.147e-08, which is under $\alpha=0,05$. Therefore, the statement average value (OI with-an-external-inventor: 2000) $>$ average value (firm-to-firm OI with-an-external-inventor: 2000) is significant.

(firm-to-firm OI: 2000) versus (firm-to-firm OI with-an-external-inventor: 2000)

>

```
t.test(X.firm.to.firm.OI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000.~id,
+ alternative='greater', conf.level=.95, var.equal=TRUE, data=Dataset)
```

Two Sample t-test

data:

X.firm.to.firm.OI.2000..versus..firm.to.firm.OI.with.an.external.inventor.2000. by id

t = 1.0386, df = 68, p-value = 0.1513

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

-0.08651479 Inf

sample estimates:

mean in group 0 mean in group 1

0.3142857 0.1714286

The probability of the statement average value (firm-to-firm OI: 2000) \leq average value (firm-to-firm OI with-an-external-inventor: 2000) has the p-value = 0.1513, which is not under $\alpha=0,05$. Therefore, there is no significant statement.

(CI: 2015) versus (OI with-an-external-inventor: 2015)

> t.test(X.CI.2015..versus..OI.with.an.external.inventor.2015.~id,

```
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

data: X.CI.2015..versus..OI.with.an.external.inventor.2015. by id

t = 7.0338, df = 42.965, p-value = 5.773e-09

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

6.978902 Inf

sample estimates:

mean in group 0 mean in group 1

10.560976 1.390244

The probability of the statement average value (CI: 2015) \leq average value (OI with-an-external-inventor: 2015) has the p-value = 5.773e-09, which is under

$\alpha=0,05$. Therefore, the statement average value (CI: 2015) > average value (OI with-an-external-inventor: 2015) is significant.

(CI: 2015) versus (firm-to-firm OI: 2015)

```
> t.test(X.CI.2015..versus..firm.to.firm.OI.2015.~id, alternative='greater',
+ conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data: X.CI.2015..versus..firm.to.firm.OI.2015. by id
t = 8.127, df = 40.152, p-value = 2.588e-10
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
 8.256996   Inf
sample estimates:
mean in group 0 mean in group 1
 10.5609756    0.1463415
```

The probability of the statement average value (CI: 2015) \leq average value (firm-to-firm OI: 2015) has the p-value = 2.588e-10, which is under $\alpha=0,05$. Therefore, the statement average value (CI: 2015) > average value (firm-to-firm OI: 2015) is significant.

(CI: 2015) versus (firm-to-firm OI with-an-external-inventor: 2015)

```
> t.test(X.CI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data: X.CI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015. by id
t = 8.249, df = 40, p-value = 1.822e-10
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
 8.405197   Inf
sample estimates:
mean in group 0 mean in group 1
 10.56098    0.00000
```

The probability of the statement average value (CI: 2015) \leq average value (firm-to-firm OI with-an-external-inventor: 2015) has the p-value = 1.822e-10, which is

under $\alpha=0,05$. Therefore, the statement average value (OI: 2015) > average value (firm-to-firm OI with-an-external-inventor: 2015) is significant.

(OI with-an-external-inventor: 2015) versus (firm-to-firm OI: 2015)

```
> t.test(X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.2015.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data: X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.2015. by id
t = 4.9189, df = 44.097, p-value = 6.272e-06
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
 0.8190202    Inf
sample estimates:
mean in group 0 mean in group 1
 1.3902439    0.1463415
```

The probability of the statement average value (OI with-an-external-inventor: 2015) \leq average value (firm-to-firm OI: 2015) has the p-value = 6.272e-06, which is under $\alpha=0,05$. Therefore, the statement average value (OI with-an-external-inventor: 2015) > average value (firm-to-firm OI: 2015) is significant.

(OI with-an-external-inventor: 2015) versus (firm-to-firm OI with-an-external-inventor: 2015)

```
>
t.test(X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data:
X.OI.with.an.external.inventor.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015. by id
t = 5.6369, df = 40, p-value = 7.65e-07
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
 0.9749539    Inf
```

sample estimates:

mean in group 0 mean in group 1
1.390244 0.000000

The probability of the statement average value (OI with-an-external-inventor: 2015) \leq average value (firm-to-firm OI with-an-external-inventor: 2015) has the p-value = $7.65e-07$, which is under $\alpha=0,05$. Therefore, the statement average value (OI with-an-external-inventor: 2015) $>$ average value (firm-to-firm OI with-an-external-inventor: 2015) is significant.

(firm-to-firm OI: 2015) versus (firm-to-firm OI with-an-external-inventor: 2015)

>

```
t.test(X.firm.to.firm.OI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015.~id,
+ alternative='greater', conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

data:

X.firm.to.firm.OI.2015..versus..firm.to.firm.OI.with.an.external.inventor.2015. by id

t = 2.6186, df = 40, p-value = 0.006205

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

0.05223933 Inf

sample estimates:

mean in group 0 mean in group 1
0.1463415 0.0000000

The probability of the statement average value (firm-to-firm OI: 2015) \leq average value (firm-to-firm OI with-an-external-inventor: 2015) has the p-value = 0.006205, which is under $\alpha=0,05$. Therefore, the statement average value (firm-to-firm OI: 2015) $>$ average value (firm-to-firm OI with-an-external-inventor: 2015) is significant.

(Group 1: CI and firm-to-firm OI: 2000) versus (Group 2: OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor: 2000)

```
> t.test(X.group.1.2000..versus..group.2.2000.~id, alternative='greater',
```

```
+ conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data: X.group.1.2000..versus..group.2.2000. by id
t = 8.9859, df = 38.211, p-value = 2.906e-11
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
 12.65027   Inf
sample estimates:
mean in group 0 mean in group 1
 18.857143    3.285714
```

The probability of the statement average value (group 1: 2000) \leq average value (group 2: 2000) has the p-value = 2.906e-11, which is under $\alpha=0,05$. Therefore, the statement average value (group 1: 2000) $>$ average value (group 2: 2000) is significant.

(Group 1: CI and firm-to-firm OI: 2015) versus (Group 2: OI with-an-external-inventor and firm-to-firm OI with-an-external-inventor: 2015)

```
> t.test(X.group.1.2015..versus..group.2.2015.~id, alternative='greater',
+ conf.level=.95, var.equal=FALSE, data=Dataset)
```

Welch Two Sample t-test

```
data: X.group.1.2015..versus..group.2.2015. by id
t = 7.0378, df = 42.873, p-value = 5.76e-09
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
 7.091437   Inf
sample estimates:
mean in group 0 mean in group 1
 10.707317    1.390244
```

The probability of the statement average value (group 1: 2015) \leq average value (group 2: 2015) has the p-value = 5.76e-09, which is under $\alpha=0,05$. Therefore, the statement average value (group 1: 2015) $>$ average value (group 2: 2015) is significant.

MEAN VALUES OF THE YEAR 2000

Nummer	Tag	Monat	firm-to-firm OI	OI with-an-external-invent	Closed Innovation	firm-to-firm OI with-an-external-invent	Summe	Group 1	Group 2
1	21	1	0	8	29	0	37	29	8
2	27	2	0	0	0	0	0	0	0
3	28	3	0	4	20	0	24	20	4
4	11	3	1	4	15	0	20	16	4
5	17	3	1	4	28	0	33	29	4
6	18	3	0	2	17	0	19	17	2
7	20	3	0	0	16	0	16	16	0
8	27	4	1	6	27	0	34	28	6
9	5	4	0	9	24	0	33	24	9
10	7	5	0	0	0	0	0	0	0
11	11	5	0	5	25	2	32	25	7
12	22	5	0	2	7	0	9	7	2
13	6	6	0	2	26	0	28	26	2
14	14	6	0	3	18	0	21	18	3
15	10	7	0	6	11	0	17	11	6
16	21	7	2	4	37	1	44	39	5
17	22	7	0	1	22	1	24	22	2
18	1	8	3	3	30	1	37	33	4
19	4	8	1	3	24	0	28	25	3
20	21	8	0	0	11	0	11	11	0
21	7	9	0	4	25	0	29	25	4
22	11	9	0	1	8	0	9	8	1
23	25	9	0	0	16	0	16	16	0
24	28	9	1	3	24	0	28	25	3
25	29	9	0	7	26	0	33	26	7
26	14	10	0	3	9	1	13	9	4
27	27	10	0	4	23	0	27	23	4
28	9	11	0	4	15	0	19	15	4
29	13	11	0	3	25	0	28	25	3
30	17	11	0	7	30	0	37	30	7
31	21	11	0	3	26	0	29	26	3
32	9	12	1	2	16	0	19	17	2
33	16	12	0	2	19	0	21	19	2
34	17	12	0	0	0	0	0	0	0
35	25	12	0	0	0	0	0	0	0
Mittelwerte			0,31	3,11	18,54	0,17	22,14	18,86	3,29

MEAN VALUES OF THE YEAR 2015

Nummer	Tag	Monat	firm-to-firm OI	OI with-an-external-inventor	Closed Innovation	firm-to-firm OI with-an-external-inventor	Summe	Group 1	Group 2
1	4	1	0	0	0	0	0	0	0
2	20	1	0	6	10	0	16	10	6
3	21	1	0	3	14	0	17	14	3
4	11	2	0	3	12	0	15	12	3
5	15	2	0	0	0	0	0	0	0
6	17	2	0	2	13	0	15	13	2
7	26	2	0	2	20	0	22	20	2
8	14	3	0	1	2	0	3	2	1
9	15	3	0	0	0	0	0	0	0
10	17	3	1	5	14	0	20	15	5
11	30	3	0	2	18	0	20	18	2
12	31	3	0	0	20	0	20	20	0
13	14	4	0	0	11	0	11	11	0
14	22	4	0	0	23	0	23	23	0
15	24	4	0	2	8	0	10	8	2
16	26	4	0	0	0	0	0	0	0
17	3	5	0	0	0	0	0	0	0
18	4	5	0	1	19	0	20	19	1
19	31	5	0	0	0	0	0	0	0
20	14	6	0	0	0	0	0	0	0
21	18	6	0	3	9	0	12	9	3
22	27	6	0	0	1	0	1	1	0
23	30	6	1	1	12	0	14	13	1
24	1	7	0	3	17	0	20	17	3
25	5	7	0	0	0	0	0	0	0
26	20	7	0	4	9	0	13	9	4
27	24	7	0	1	8	0	9	8	1
28	1	8	0	0	6	0	6	6	0
29	6	8	1	1	18	0	20	19	1
30	25	8	1	2	11	0	14	12	2
31	13	10	1	0	25	0	26	26	0
32	14	9	0	1	8	0	9	8	1
33	11	10	0	0	0	0	0	0	0
34	15	10	0	2	11	0	13	11	2
35	22	10	0	2	14	0	16	14	2
36	2	11	0	1	26	0	27	26	1
37	4	11	0	1	19	0	20	19	1
38	11	11	0	1	18	0	19	18	1
39	20	11	0	2	13	0	15	13	2
40	17	12	1	5	24	0	30	25	5
41	27	12	0	0	0	0	0	0	0
Mittelwerte			0,15	1,39	10,56	0,00	12,1	10,71	1,39

TREND DEVELOPMENTS



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Geben Sie die Nummern mit oder ohne Ländercode ein

Veröffentlichungsnummer <input type="checkbox"/>	zB EP1883031
<input type="text" value="EP"/>	
Anmeldenummer <input type="checkbox"/>	zB EP20070010825
<input type="text" value="EP"/>	
Prioritätsnummer <input type="checkbox"/>	zB US20030423700
<input type="text" value="DE"/>	

Geben Sie ein Datum/mehrere Daten ein (und/oder bei Veröffentlichungsdatum Datumsbereich)

Anmeldedatum <input type="checkbox"/>	zB 20070919
<input type="text" value="2001"/>	
Veröffentlichungsdatum <input type="checkbox"/>	zB 20070919
<input type="text"/>	
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Erteilungsdatum <input type="checkbox"/>	zB 20070919
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<input type="text"/>	
Erfinder <input type="checkbox"/>	zB Siemens
<input type="text"/>	
Vertreter <input type="checkbox"/>	zB vande gucht
<input type="text"/>	
Einsprechender <input type="checkbox"/>	zB basf
<input type="text"/>	

Geben Sie ein oder mehrere Klassifikationssymbole ein.

Internationale Patentklassifikation (IPC) <input type="checkbox"/>	zB H02M7/637 H03K17/687
<input type="text" value="H03"/>	

Geben Sie ein oder mehrere Schlagwörter ein.

Schlagwörter im Titel <input type="checkbox"/>	zB Motor
<input type="text"/>	



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Suchergebnisse

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213 Ergebnisse gefunden, Trefferanzeige von 101 bis 120.
Suchbegriff(e): (((filing-date = 2001 and classification = H03) and application = EP) and publication = EP) and priority = DE

1 2 3 4 5 **6** 7 8 9 >

Widerstandskaskade zum Bilden elektrischer Referenzgrößen und Analog-/Digital-Wandler

Anmeldnr. EP01119466	Veröffentlichungsnr. EP1182784	Anmelder Infineon Technologies AG	Vertreter Viering, Jentschura & Partner mbB Patent- und Rechtsanwälte	IPC H03M1/36 H01C13/00
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Verstärkerschaltung

Anmeldnr. EP01119337	Veröffentlichungsnr. EP1189341	Anmelder Finisar Corporation	Vertreter Müller, Wolfram Hubertus, et al	IPC H03F1/52 H03F3/45
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Komprimieren von HMM-Prototypen

Anmeldnr. EP01119279	Veröffentlichungsnr. EP1187098	Anmelder SIEMENS AKTIENGESELLSCHAFT	Vertreter ...	IPC G10L15/28
---	---	--	------------------	------------------

Schaltungsanordnung und Anzeigeelement

Anmeldnr. EP01119171	Veröffentlichungsnr. EP1189350	Anmelder Infineon Technologies AG	Vertreter Westphal, Mussnug & Partner Patentanwälte mbB	IPC H03K17/18
---	---	--------------------------------------	--	----------------------------------

Frequenzteilerschaltung

Anmeldnr. EP01119046	Veröffentlichungsnr. EP1187332	Anmelder Infineon Technologies AG	Vertreter Epping - Hermann - Fischer	IPC H03K23/50 H03K3/2885
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Variables Taktschema für Switched-Opamp-Schaltungen

Anmeldnr. EP01118996	Veröffentlichungsnr. EP1187312	Anmelder Infineon Technologies AG	Vertreter Lange, Thomas, et al	IPC H03F3/00 H03K5/15 H03K5/13
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Schaltbarer Operationsverstärker für Switched-Opamp-Anwendungen

Anmeldnr. EP01118528	Veröffentlichungsnr. EP1187315	Anmelder Infineon Technologies AG	Vertreter Lange, Thomas, et al	IPC H03F3/72
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Überstromgeschützter Halbleiterleistungsschalter, insbesondere zum Schalten niederohmiger Lasten

Anmeldnr. EP01118563	Veröffentlichungsnr. EP1178606	Anmelder Infineon Technologies AG	Vertreter Müller Hoffmann & Partner	IPC H03K17/082
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Schaltungsanordnung

Anmeldnr. EP01203562	Veröffentlichungsnr. EP1202450	Anmelder NXP B.V.	Vertreter van der Veer, Johannes Leendert, et al	IPC H03H7/01 H03H5/00
---	---	----------------------	---	---

Kurzhilfe

- [Wie kann ich in den Treffern navigieren?](#)
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- [Warum werden in der Spalte "Vertreter" in meiner Trefferliste Punkte statt eines Namens angezeigt?](#)

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Kurzmeldungen +

Themenbezogene Links +

EP1187098

Europäisches Verfahren

EP Übersicht

- EP Rechtsstand
- EP Vereinigtes Register
- EP Alle Ereignisse
- EP Angeführte Dokumente
- EP Patentfamilie
- EP Alle Dokumente

EP Übersicht: EP1187098

Suche verfeinern | ST36 | Verlauf anzeigen | Voriges | 103/213 | Nächstes | Espacenet | Einwendungen einreichen | Fehler melden | Drucken

EP 1187098 - Komprimieren von HMM-Prototypen [Mit Rechtsklick auf diesen Link können Sie ein Bookmark anlegen.]

Status	Kein Einspruch fristgerecht eingelegt Status aktualisiert am 17.09.2007 Datenbank zuletzt aktualisiert am 02.07.2018		
Letztes Ereignis	17.08.2007	Kein Einspruch fristgerecht eingelegt	veröffentlicht am 19.09.2007 [2007/38]
Anmelder	Für alle benannten Staaten SIEMENS AKTIENGESELLSCHAFT Werner-von-Siemens-Str. 1 DE-80333 München / DE [NIP]		
Erfinder	01 / Hoeye, Harald, Dr. Falkenweg 7 82131 Gauting / DE -> [2002/11]		
Anmeldenummer, Anmeldetag	01119279.6	09.08.2001	
	[2002/11]		
Prioritätsnummer, Prioritätstag	DE 2000143946	06.09.2000	Ursprünglich veröffentlichtes Format: DE 10043946
	[2002/11]		
Anmeldesprache	DE		
Verfahrenssprache	DE		
Veröffentlichung	Art: -> A2 Anmeldung ohne Recherchenbericht Nr.: EP 1187098 Datum: 13.03.2002 Sprache: DE [2002/11] Art: -> A3 Recherchenbericht Nr.: EP 1187098 Datum: 22.01.2003 [2003/04]		

Kurzhilfe

- > Was bedeutet "XML-Daten herunterladen"?
- > Welche Informationen finde ich in "Verlauf anzeigen"?
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- > Wofür verweisen die Ziffern in schließlichen Klammern?
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- > Wofür steht unter "Angeführte Dokumente" der Buchstabe in schließlichen Klammern?
- > Kann ich in der Trefferliste navigieren?
- > Welche Informationen finde ich unter "Ereignissen" während des Erfindungsverfahrens?
- > Was sind Validierungsstaat(en)?
- > Was sind Erstreichungsstaaten?

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EP1187098

Europäisches Verfahren

EP Alle Dokumente

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Suche verfeinern | Ausgewählte Dokumente | ZIP-Archiv | Voriges | 103/213 | Nächstes | Espacenet | Einwendungen einreichen | Fehler melden | Drucken

Alle Dokumente(42) | Suchen

Datum	Dokumententyp	Verfahren	Seitenzahl
16.08.2007	Mitteilung über den Ablauf der Einspruchsfrist	Recherche / Prüfung	1
14.09.2006	Entscheidung über die Erteilung eines europäischen Patents	Recherche / Prüfung	2
06.07.2006	Erfordernisbescheinigung über die elektronische Übermittlung des Antrags auf Erteilung eines europäischen Patents	Recherche / Prüfung	1
06.07.2006	Englische Übersetzung der Patentansprüche	Recherche / Prüfung	2
06.07.2006	Französische Übersetzung der Patentansprüche	Recherche / Prüfung	2
06.07.2006	Begleit Schreiben für nachgereichte Unterlagen	Recherche / Prüfung	1
30.03.2006	Bibliographische Daten der europäischen Patentanmeldung	Recherche / Prüfung	1
30.03.2006	Mitteilung über die beabsichtigte Erteilung eines europäischen Patents	Recherche / Prüfung	5
30.03.2006	Erteilungsabsicht (Unterschriften)	Recherche / Prüfung	1
30.03.2006	Für die Erteilung vorgesehene Textfassung	Recherche / Prüfung	16
17.02.2005	Patentansprüche	Recherche / Prüfung	2
17.02.2005	Patentansprüche	Recherche / Prüfung	2
17.02.2005	Antwort auf Bescheid der Prüfungsabteilung	Recherche / Prüfung	4
29.12.2004	Antrag auf Fristverlängerung zum Bescheid der Prüfungsabteilung	Recherche / Prüfung	1
08.09.2004	Anlage zum Bescheid	Recherche / Prüfung	3
08.09.2004	Bescheid der Prüfungsabteilung	Recherche / Prüfung	1
05.03.2004	Zusammenfassung	Recherche / Prüfung	1
05.03.2004	Zusammenfassung	Recherche / Prüfung	1
05.03.2004	Patentansprüche	Recherche / Prüfung	2
05.03.2004	Patentansprüche	Recherche / Prüfung	2
05.03.2004	Beschreibung	Recherche / Prüfung	12
05.03.2004	Beschreibung	Recherche / Prüfung	12
05.03.2004	Antwort auf Bescheid der Prüfungsabteilung	Recherche / Prüfung	2

Kurzhilfe

- > Kann ich Dokumente herunterladen?
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- > Kann ich die Dokumentenliste sortieren?
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- > Kann ich mehrere Dokumente in separaten Fenstern öffnen?
- > Kann ich ein Dokument ausdrucken?

Wartungsmeldungen +

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**Erfindernennung
Designation of inventor
Désignation de l'inventeur**

(falls Anmelder nicht oder nicht allein der Erfinder ist) /
(where the applicant is not the inventor or is not the
sole inventor) / (si le demandeur n'est pas l'inventeur
ou l'unique inventeur)

Zeichen des Anmelders oder Vertreters:
Applicant's or representative's reference:
Référence du demandeur ou du mandataire :
(max. 15 Positionen / max. 15 spaces /
15 caractères au maximum)

2000P14682EP

Nr. der Anmeldung oder, falls noch nicht bekannt, Bezeichnung der Erfindung:
Application No. or, if not yet known, title of the invention :
N° de la demande ou, s'il n'est pas encore connu, titre de l'invention:

Komprimieren von HMM-Prototypen

In Sachen der obenbezeichneten europäischen Patentanmeldung nennst (nennen) der (die) Unterzeichnete(n)¹
In respect of the above European patent application I (we), the undersigned¹
En ce qui concerne la demande de brevet européen susmentionnée, le(s) soussigné(s)¹

Siemens Aktiengesellschaft

EPO - Munich
51
09. Aug. 2001

als Erfinder²:
do hereby designate as inventor(s)²:
désigne(nt) en tant qu'inventeur(s)²:

1)
Dr. HARALD HOEGE
FALKENWEG 7
82131 GAUTING

Weitere Erfinder sind auf dem zweiten Blatt angegeben. / Additional inventors indicated on second sheet. /
D' autres inventeurs sont mentionnés sur une deuxième feuille.

Der (Die) Anmelder hat (haben) das Recht auf das europäische Patent erlangt³
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as successor(s) in title
par transfert
successoral

Ort/Place/Lieu : München

Datum/Date : 09.08.2001

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AIPLA (2018) *AIPLA American Intellectual Property Law Association*. Available at: <http://www.aipla.org/advocacy/congress/aia/Pages/summary.aspx> (Accessed: 20 June 2018).

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Filing Reforms

- **First Inventor to File** - Section 3
 - Under this section, the U.S. transitions from a First to Invent patent system to a system where priority is given to the first inventor to file a patent application.
 - A derivation proceeding is established to replace the interference proceeding currently employed by the USPTO. The purpose is to determine whether a claimed invention in an earlier filed application was derived from the later filed application.
 - Effective Date: March 16, 2013
- **Assignee Filing** - Section 4
 - Under the AIA, the processes of filing and prosecuting a patent application for an assignee of, or a person to whom the inventor is obligated to assign an invention is simpler and more flexible, allowing a substitute statement to be submitted where the inventor is unable or unwilling to sign an inventor's oath.
 - Effective date: September 16, 2012.
- **Penalty for Paper Filing** - Section 10
 - Effective 60 days after enactment, there is a \$400 (\$200 for small entities) fee for filings made by non-electronic means to incentivize electronic filing.
- **Best Mode Requirement diluted** - Section 15
 - Upon enactment of the AIA, a patent may not be cancelled or invalidated based on an applicant's failure to disclose "the best mode" of carrying out an invention.
- **Human Organism Patents** - Section 33
 - The AIA prohibits granting patents for human organisms. This provision does not apply to previously issued patents.

Examination Reforms

- **Definition of Prior Art** - Section 3
 - The AIA presents a new definition of "prior art" under Section 102.
 - New Section 102(a)(1) keeps Section 102(b) standards (on sale, used in public, published and patented) and adds "or otherwise available to public."
 - New Section 102(a)(2) includes an earlier filed application naming another inventor, excluding inventor-derived information or public disclosure, commonly owned patents and applications, and joint research agreements
- **Inventor Grace Period** - Section 3
 - Under new Section 102(b), publication of a claimed invention by the inventor less than 1 year before the filing of a patent application may

Relevant Links
AIA Homepage
AIPLA Legislative Advocacy
AIPLA Advocacy before the USPTO

Bundesanzeiger (2009) *Änderung des Gesetzes über Arbeitnehmererfindungen.*
Available at:

http://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&jumpTo=bgbl109s2521.pdf (Accessed: 4 April 2018).

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Bundesgesetzblatt Teil 1, Nr. 50 1 / 8

Bundesgesetzblatt Jahrgang 2009 Teil I Nr. 50, ausgegeben zu Bonn am 4. August 2009 **2521**

**Gesetz
zur Vereinfachung und Modernisierung des Patentrechts**
Vom 31. Juli 2009

Der Bundestag hat das folgende Gesetz beschlossen:

**Artikel 1
Änderung
des Patentrechts**

Das Patentrecht wird in der Fassung der Bekanntmachung vom 16. Dezember 1980 (BGBl. 1981 I S. 1), zuletzt geändert durch Artikel 83a des Gesetzes vom 17. Dezember 2008 (BGBl. I S. 2586), wie folgt geändert:

1. § 16a wird wie folgt geändert:
 - a) In Absatz 1 Satz 1 wird das Wort „Wirtschaftsgemeinschaft“ durch das Wort „Gemeinschaften“ ersetzt.
 - b) In Absatz 2 werden die Wörter „, über Gebühren (§ 17 Abs. 2)“ gestrichen.
2. § 25 Abs. 2 Satz 2 wird aufgehoben.
3. In § 30 Abs. 1 Satz 2 wird das Wort „Teilung,“ gestrichen.
4. § 49a wird wie folgt geändert:
 - a) In Absatz 1 werden die Wörter „des Rates der Europäischen Wirtschaftsgemeinschaft“ durch die Wörter „der Europäischen Gemeinschaften“ und die Angabe „Absatz 3“ durch die Angabe „Absatz 5“ ersetzt.
 - b) Nach Absatz 2 werden die folgenden Absätze 3 und 4 eingefügt:

„(3) Soweit eine Verordnung der Europäischen Gemeinschaften die Verlängerung der Laufzeit eines ergänzenden Schutzzertifikats vorsieht, gelten die Absätze 1 und 2 entsprechend und bestimmt Termin zur mündlichen Verhandlung. Mit Zustimmung der Parteien kann von einer mündlichen Verhandlung abgesehen werden. Absatz 2 bleibt unberührt.“

7. § 83 wird wie folgt gefasst:

„§ 83

(1) In dem Verfahren wegen Erklärung der Nichtigkeit des Patents oder des ergänzenden Schutzzertifikats weist das Patentgericht die Parteien so früh wie möglich auf Gesichtspunkte hin, die für die Entscheidung voraussichtlich von besonderer Bedeutung sein werden oder der Konzentration der Verhandlung auf die für die Entscheidung wesentlichen Fragen dienlich sind. Eines solchen Hinweises bedarf es nicht, wenn die zu erörternden Gesichtspunkte nach dem Vorbringen der Parteien offensichtlich erscheinen. § 139 der Zivilprozessordnung ist ergänzend anzuwenden.

(2) Das Patentgericht kann den Parteien eine Frist setzen, binnen welcher sie zu dem Hinweis nach Absatz 1 durch sachdienliche Anträge oder Ergänzungen ihres Vorbringens und auch im Übrigen abschließend Stellung nehmen können. Die Frist kann verlängert werden, wenn die betroffene Partei hierfür erhebliche Gründe darlegt. Diese sind glaubhaft zu machen.

(3) Die Befugnisse nach den Absätzen 1 und 2 können auch von dem Vorsitzenden oder einem von ihm zu bestimmenden Mitglied des Senats wahrgenommen werden.

(4) Das Patentgericht kann Angriffs- und Verteidigungsmittel einer Partei oder eine Klageänderung oder eine Verteidigung des Beklagten mit einer ge-

die Bekanntmachungskosten erfolgen; das gilt auch, wenn Anträge geändert werden.“

4. Dem § 6 wird folgender Absatz 4 angefügt:

„(4) Zahlt der Erinnerungsführer die Gebühr für das Erinnerungsverfahren nicht, nicht rechtzeitig oder nicht vollständig, so gilt auch die von ihm nach § 64 Abs. 6 Satz 2 des Markengesetzes eingelegte Beschwerde als zurückgenommen.“

5. Dem § 13 wird folgender Absatz 4 angefügt:

„(4) Verfahrenshandlungen, die eine Anmeldung oder einen Antrag ändern, wirken sich nicht auf die Höhe der Gebühr aus, wenn die Gebühr zur Zeit des verfahrenseinleitenden Antrages nicht nach dessen Umfang bemessen wurde.“

„...den Zeitpunkt, von dem an die Prozessakten nach Absatz 2 elektronisch geführt werden können, sowie die hierfür geltenden organisatorisch-technischen Rahmenbedingungen für die Bildung, Führung und Aufbewahrung der elektronischen Prozessakten.“

3. § 58 Abs. 2 Satz 2 wird aufgehoben.

Artikel 7

**Änderung des
Gesetzes über Arbeitnehmererfindungen**

Das Gesetz über Arbeitnehmererfindungen in der im Bundesgesetzblatt Teil III, Gliederungsnummer 422-1, veröffentlichten bereinigten Fassung, zuletzt geändert durch das Gesetz vom 18. Januar 2002 (BGBl. I S. 414), wird wie folgt geändert:

Das Bundesgesetzblatt im Internet: www.bundesgesetzblatt.de | Ein Service des Bundesanzeiger Verlag www.bundesanzeiger-verlag.de



Bundesgesetzblatt Jahrgang 2009 Teil I Nr. 50, ausgegeben zu Bonn am 4. August 2009

2527

1. In § 5 Abs. 1 Satz 1 und 3 wird jeweils das Wort „schriftlich“ durch die Wörter „in Textform“ ersetzt.

2. § 6 wird wie folgt geändert:

a) In Absatz 1 werden die Wörter „unbeschränkt oder beschränkt“ durch die Wörter „durch Erklärung gegenüber dem Arbeitnehmer“ ersetzt.

b) Absatz 2 wird wie folgt gefasst:

„(2) Die Inanspruchnahme gilt als erklärt, wenn der Arbeitgeber die Diensterfindung nicht bis zum Ablauf von vier Monaten nach Eingang der ordnungsgemäßen Meldung (§ 5 Abs. 2 Satz 1 und 3) gegenüber dem Arbeitnehmer durch Erklärung in Textform freigibt.“

3. § 7 wird wie folgt geändert:

a) Absatz 1 wird wie folgt gefasst:

„(1) Mit der Inanspruchnahme gehen alle vermögenswerten Rechte an der Diensterfindung auf den Arbeitgeber über.“

b) Absatz 2 wird aufgehoben.

c) Absatz 3 wird Absatz 2.

4. § 8 wird wie folgt gefasst:

a) In Absatz 1 Satz 1 wird das Wort „schriftlich“ durch die Wörter „durch Erklärung in Textform“ ersetzt.

b) In Absatz 2 werden die Wörter „durch schriftliche Erklärung“ durch die Wörter „durch Erklärung in Textform“ und die Wörter „er die Erfindung nicht mehr als Diensterfindung in Anspruch nehmen“ durch die Wörter „die Erfindung nicht mehr als Diensterfindung in Anspruch genommen werden (§ 6)“ ersetzt.

12. § 21 wird aufgehoben.

13. In § 23 Abs. 2 werden die Wörter „schriftliche Erklärung“ durch die Wörter „Erklärung in Textform“ ersetzt.

14. In § 24 Abs. 2 und § 25 wird jeweils die Angabe „Abs. 1“ gestrichen.

15. § 27 wird wie folgt gefasst:

„§ 27

Insolvenzverfahren

Wird nach Inanspruchnahme der Diensterfindung das Insolvenzverfahren über das Vermögen des Arbeitgebers eröffnet, so gilt folgendes:

Bundesministerium der Justiz und für Verbraucherschutz (2018)
Patentgesetz/gesetze-im-internet. Available at: <http://www.gesetze-im-internet.de/patg/BJNR201170936.html#BJNR201170936BJNG000100311>
 (Accessed: 13 April 2018).



Patentgesetz

[Nichtamtliches Inhaltsverzeichnis](#)

PatG

Ausfertigungsdatum: 05.05.1936

Volltext:

"Patentgesetz in der Fassung der Bekanntmachung vom 16. Dezember 1980 (BGBl. 1981 I S. 1), das zuletzt durch Artikel 4 des Gesetzes vom 8. Oktober 2017 (BGBl. I S. 3546) geändert worden ist"

Stand: Neugefasst durch Bek. v. 16.12.1980; 1981 I 1;
 zuletzt geändert durch Art. 4 G v. 8.10.2017 I 3546

Näheres zur Standangabe finden Sie im Menü unter [Hinweise](#)

Fußnote

(+++ Textnachweis Stellung ab: 1.1.2005 +++)
 (+++ Amtlicher Hinweis des Normgebens auf EG-Recht:
 Umsetzung der
 EURL 44/98 (CELEX: 398L0044) vgl. S v. 23.1.2005 I 346 +++)
 (+++ Zur Anwendung d. § 123 Abs. 1 bis 5, 7, §§ 124, 126 bis 128a
 vgl. § 23 Abs. 3 Satz 3 GeschNfG 2004 +++)

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Erster Abschnitt
Das Patent

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§ 1

(1) Patente werden für Erfindungen auf allen Gebieten der Technik erteilt, sofern sie neu sind, auf einer erfinderischen Tätigkeit beruhen und gewerblich anwendbar sind.

Deutscher Bundestag (2010) *Deutscher Bundestag, 17/1052 - Antrag: Neue Initiative für Neuheitsschonfrist im Patentrecht starten*. Available at: <https://www.bundestag.de/service/suche?suchbegriff=Drucksache+17%2F1052> (Accessed: 20 June 2018).



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Deutsches
Patent- und Markenamt



P 2 7 9 2 1 0 . 1 1 1 1

Erfinderbenennung

Die Erfinderbenennung muss auch erfolgen, wenn der Anmelder selbst der Erfinder ist. Ist der Anmelder Miterfinder, so ist er auch mitzubennenen.

Amtliches Aktenzeichen (wenn bereits bekannt)

Platz für Zeichen des Anmelders/Vertreters

Bezeichnung der Erfindung (bitte vollständig)

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Vor- und Zuname

Straße, Hausnummer

Postleitzahl Ort

Erfinder (2)
Vor- und Zuname

Straße, Hausnummer

Postleitzahl Ort

Erfinder (3)
Vor- und Zuname

Straße, Hausnummer



Erfinder (4)
 Vor- und Zuname

 Straße, Hausnummer

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Achtung: bei mehr als vier Erfindern bitte gesondertes Blatt benutzen!

Das Recht auf das Patent ist auf den Anmelder übergegangen durch:

(z.B. Erfinder ist/sind der/die Anmelder, Inanspruchnahme aufgrund §§ 6 u. 7 ArbNErfG, Kaufvertrag mit Angabe des Datums, Erbschaft usw.)

Es wird versichert, dass nach Wissen des/der Unterzeichner/s weitere Personen an der Erfindung nicht beteiligt sind.

_____, den _____

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 Bei Firmen genaue, eingetragene Firmenbezeichnung angeben.

Antrag auf Nichtnennung als Erfinder

Nur von denjenigen oben genannten Erfindern auszufüllen, die nach außen hin nicht bekanntgegeben werden wollen (§ 63 Abs. 1 S. 3 PatG).


Der Antrag kann jederzeit widerrufen werden. Ein Verzicht des Erfinders auf Nennung ist ohne rechtliche Wirksamkeit (§ 63 Abs. 1 S. 4 u. 5 PatG).

Es wird beantragt, den bzw. die Unterzeichner dieses Antrags in der oben angegebenen Patentanmeldung als Erfinder nicht öffentlich bekanntzugeben. Die Einsicht in die obige Erfinderbenennung wird nur bei Glaubhaftmachung eines berechtigten Interesses gewährt.

_____, den _____

Eigenhändige Unterschrift des Erfinders oder der Erfinder

DPMA (2018e) *International Patent Classification*. Available at: <https://depatisnet.dpma.de/ipc/ipc.do?s=H03&v=20180101&l=DE&dh=dh11&sn=n00&sci=i00#H03> (Accessed: 26 April 2018).



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C08B 11/193: H03</p> <p>Sprache: <input checked="" type="checkbox"/> DE <input type="checkbox"/> EN <input type="checkbox"/> FR</p> <p>IPC-Ausgabe/Version: 2018.01(aktuell) ▾</p> <hr/> <p>Anzeigeoptionen</p> <p>maximale Punkthierarchie: 11-Punkt Untergruppe ▾</p> <p> <input type="checkbox"/> Hierarchie <input type="checkbox"/> DEKLA-Gruppen <input checked="" type="checkbox"/> Anmerkungen <input checked="" type="checkbox"/> Sachverzeichnisse <input type="checkbox"/> Stich- und Schlagworte </p> <hr/> <p>jsführen</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="text-align: center; vertical-align: top;">H03</td> <td style="vertical-align: top;">Grundlegende elektronische Schaltkreise</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A D</td> <td style="text-align: center; vertical-align: top;">H03B</td> <td style="vertical-align: top;"> Erzeugung von Schwingungen, unmittelbar oder durch Frequenzwandlung, durch Schaltungsanordnungen (Generatoren besonders ausgebildet für elektroakustische Musikinstrumente G) <u>Sachverzeichnis der Unterklasse</u> ERZEUGUNG OHNE ÄNDERUNG DER FREQUENZ mit Hilfe von Verstärkung und Rückkopplung; negativem Widerstand H03B 5/00; H03B 7/00 mit Hilfe der Laufzeit; mittels Elektronenstrahlröhren H03B 9/00; H03B 13/00 durch Stoßerregung; Hall-Effekt; Strahlungsquelle und Detektor H03B 11/00; H03B 15/00; H03B ERZEUGUNG MIT ÄNDERUNG DER FREQUENZ durch Multiplikation oder Division eines Signals H03B 19/00 durch Zusammensetzen unmodulierter Signale H03B 21/00 BESONDERHEITEN VON ERZEUGTEN SCHWINGUNGEN Wobelfrequenz; Mehrfrequenzbereich; Mehrphasenbereich; Rauschen H03B 23/00; H03B 25/00; H03B ANDERE VERFAHREN DER ERZEUGUNG H03B 28/00 EINZELHEITEN H03B 1/00 </td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A D</td> <td style="text-align: center; vertical-align: top;">H03C</td> <td style="vertical-align: top;"> Modulation (Maser oder Laser H01S; Codieren, Decodieren oder Codeumsetzung H03M) Anmerkung: 1. Diese Unterklasse <u>umfasst</u> nur Modulation, Tasten oder Unterbrechen von sinusförmigen Sc 2. Schaltungen in dieser Unterklasse, die sowohl als Modulator als auch als Demodulator verw </td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A D</td> <td style="text-align: center; vertical-align: top;">H03D</td> <td style="vertical-align: top;"> Demodulation oder Übertragung einer Modulation von einem Träger auf einen anderen (N H03C 1/54; Einzelheiten, die sowohl bei Modulatoren als auch bei Frequenzwandlern anwendbar sind; H03C; H03K 11/00; Relaisübertragungssysteme, z.B. Verstärkerstationen H04B 7/14; Demodulation bei Systemen r Anmerkung: Diese Unterklasse <u>umfasst</u> nur: o Demodulation oder Übertragung von auf einen sinusförmigen Träger oder auf elektr o Vergleich von Phase oder Frequenz von zwei gegenseitig unabhängigen Schwingung </td> </tr> <tr> <td></td> <td></td> <td style="vertical-align: top;"> <u>Sachverzeichnis der Unterklasse</u> DEMODULATION Amplitude; Winkel; kombiniert; Pendelrückkopplung H03D 1/00 ÜBERTRAGUNG H03D 7/00 VERGLEICH DER PHASE ODER DER FREQUENZ H03D 13/0 SACHVERHALTE, SOWEIT NICHT IN ANDEREN GRUPPEN DIESER UNTERKLASSE VORGESEHEN H03D 59/0 </td> </tr> <tr> <td style="text-align: center; vertical-align: top;">A</td> <td style="text-align: center; vertical-align: top;">H03F</td> <td style="vertical-align: top;"> Verstärker (Messen, Prüfen G01B; optische parametrische Verstärker G02F; Schaltungsanordnungen mit t H03G; Kopplungsanordnungen, unabhängig von der Ausbildung des Verstärkers, Spannungsteiler H03H; Vers Sprachverstärkern im Fernspreckverkehr H04M 1/60 , H04M 3/40) Anmerkung: Diese Unterklasse <u>umfasst</u>: o Verstärkung, wobei eine lineare Beziehung zwischen den Eingangs- und Ausgangsar o dielektrische, magnetische und parametrische Verstärker, wenn sie als Oszillatoren o Ausführungen der aktiven Elemente von dielektrischen und parametrischen Verstärk </td> </tr> </table>	A	H03	Grundlegende elektronische Schaltkreise	A D	H03B	Erzeugung von Schwingungen, unmittelbar oder durch Frequenzwandlung, durch Schaltungsanordnungen (Generatoren besonders ausgebildet für elektroakustische Musikinstrumente G) <u>Sachverzeichnis der Unterklasse</u> ERZEUGUNG OHNE ÄNDERUNG DER FREQUENZ mit Hilfe von Verstärkung und Rückkopplung; negativem Widerstand H03B 5/00 ; H03B 7/00 mit Hilfe der Laufzeit; mittels Elektronenstrahlröhren H03B 9/00 ; H03B 13/00 durch Stoßerregung; Hall-Effekt; Strahlungsquelle und Detektor H03B 11/00 ; H03B 15/00 ; H03B ERZEUGUNG MIT ÄNDERUNG DER FREQUENZ durch Multiplikation oder Division eines Signals H03B 19/00 durch Zusammensetzen unmodulierter Signale H03B 21/00 BESONDERHEITEN VON ERZEUGTEN SCHWINGUNGEN Wobelfrequenz; Mehrfrequenzbereich; Mehrphasenbereich; Rauschen H03B 23/00 ; H03B 25/00 ; H03B ANDERE VERFAHREN DER ERZEUGUNG H03B 28/00 EINZELHEITEN H03B 1/00	A D	H03C	Modulation (Maser oder Laser H01S ; Codieren, Decodieren oder Codeumsetzung H03M) Anmerkung: 1. 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DPMA (2018f) *Priority Country, Application Country, Applicant*. Available at: <https://depatisnet.dpma.de/prod/de/hilfe/researchierbarefelder/index.html#aPUB> (Accessed: 23 June 2018).

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Textfelder	Titel (Title)	(TI)	+	+	+
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	Anmeldeland (Country of application)	(AC)		+	+
	Anmeldedatum (Application date)	(AD)		+	+
	Anmeldejahr (Application year)	(AY)		+	+
Daten zur Priorität	Prioritätsnummer (Priority number)	(PRN)		+	+
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Enlarged Board of Appeal

T 0444/88 () of 9.5.1990

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European Case Law Identifier:	ECLI:EP:BA:1990:T044488:19900509
Date of decision:	09 May 1990
Case number:	T 0444/88
Application number:	81109804.5
IPC class:	C08J 9/16
Language of proceedings:	EN
Distribution:	
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 536.212K)
	Documentation of the appeal procedure can be found in the Register
	Bibliographic information is available in: EN
Versions:	Unpublished
Title of application:	Process for the production of pre-foamed particles of polypropylene resin
Applicant name:	Japan Styrene Paper
Opponent name:	BASF AG
Board:	3.3.03
Headnote:	-
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54 > European Patent Convention 1973 Art 56 > European Patent Convention 1973 Art 112


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- Entscheidungen: 2000

T 0153/88 () of 9.1.1991

European Case Law Identifier:	ECLI:EP:BA:1991:T015388.19910109
Datum der Entscheidung:	09. Januar 1991
Aktenzeichen:	T 0153/88
Anmeldenummer:	80107296.8
IPC-Klasse:	C21D 8/02
Verfahrenssprache:	DE
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	Fassungen: Unpublished
Bezeichnung der Anmeldung:	Warmband oder Grobblech aus einem denitrierten Stahl und Verfahren zu seiner Herstellung
Name des Anmelders:	Stahlwerke Peine-Salzgitter AG
Name des Einsprechenden:	1) Thyssen Stahl AG 2) Hoesch AG
Kammer:	3.3.03
Leitsatz:	-

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T 0059/90 () of 12.3.1993

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European Case Law Identifier:	ECLI:EP:BA:1993:T005990:19930312
Datum der Entscheidung:	12 März 1993
Aktenzeichen:	T 0059/90
Anmeldenummer:	84113531.2
IPC-Klasse:	C08G 59/40
Verfahrenssprache:	DE
Verteilung:	C
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Bibliografische Daten verfügbar in:	DE
Fassungen:	Unpublished
Bezeichnung der Anmeldung:	Härter für Epoxidharzmassen
Name des Anmelders:	SKW Trostberg Aktiengesellschaft
Name des Einsprechenden:	BASF Aktiengesellschaft, Ludwigshafen
Kammer:	3.3.03
Leitsatz:	-
Relevante Rechtsnormen:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54 > European Patent Convention 1973 Art 56



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T 0602/91 (Gipskartonplattenherstellung/BAYER) of 13.9.1994

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European Case Law Identifier:	ECLI:EP:BA:1994:T060291.19940913
Datum der Entscheidung:	13 September 1994
Aktenzeichen:	T 0602/91
Anmeldenummer:	85109532.3
IPC-Klasse:	C04B 28/14
Verfahrenssprache:	DE
Verteilung:	B
Download und weitere Informationen:	<input type="checkbox"/> Text der Entscheidung in DE (PDF, 583.059K) Alle Dokumente zum Beschwerdeverfahren finden Sie im Register
Bibliografische Daten verfügbar in:	DE
Fassungen:	Unpublished
Bezeichnung der Anmeldung:	Verfahren zur Herstellung wasserabweisender Formkörper aus Gips
Name des Anmelders:	BAYER AG
Name des Einsprechenden:	I) Rigips GmbH II) WACKER-CHEMIE GMBH
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Leitsatz:	-



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Große Beschwerdekammer

T 0634/91 () of 31.5.1994

European Case Law Identifier:	ECLI:EP:BA:1994:T063491:19940531
Datum der Entscheidung:	31 Mai 1994
Aktenzeichen:	T 0634/91
Anmeldenummer:	82109768.0
IPC-Klasse:	B27B 5/34
Verfahrenssprache:	DE
Verteilung:	B
Download und weitere Informationen:	<input type="checkbox"/> Text der Entscheidung in DE (PDF, 301.839K) Alle Dokumente zum Beschwerdeverfahren finden Sie im Register Bibliografische Daten verfügbar in: DE Fassungen: Unpublished
Bezeichnung der Anmeldung:	Kreissäge mit verstellbaren Sägeblättern
Name des Anmelders:	Gebrüder Linck, Maschinenfabrik "Gatterlinck" GmbH & Co. KG
Name des Einsprechenden:	1) Wurster & Dietz GmbH & Co. Maschinenfabrik (1) 2) Maschinenfabrik Esterer AG (2)
Kammer:	3.2.02
Leitsatz:	-
Relevante Rechtsnormen:	> European Patent Convention 1973 Art 114(1) > European Patent Convention 1973 R 60(2)
Schlagwörter:	Termination of appeal proceedings - withdrawal of



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EPO (1996b) T739/92. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t920739eu1.html> (Accessed: 31 May 2018).



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Enlarged Board of Appeal

T 0739/92 () of 16.7.1996

European Case Law Identifier:	ECLI:EP:BA:1996:T073992.19960716
Date of decision:	16 July 1996
Case number:	T 0739/92
Application number:	86102074.1
IPC class:	C08G 59/50
Language of proceedings:	EN
Distribution:	C
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 104.645K)
Documentation of the appeal procedure can be found in the Register	
Bibliographic information is available in: EN	
Versions: Unpublished	
Title of application:	Thermosetting epoxy resin compositions and thermosets therefrom
Applicant name:	HERCULES INCORPORATED
Opponent name:	BASF Aktiengesellschaft, Ludwigshafen
Board:	3.3.03
Headnote:	-
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54(2) > European Patent Convention 1973 Art 56
Keywords:	Novelty - availability to the public - obligation to maintain secrecy -

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EPO (1996c) T823/93. Available at: [http://www.epo.org/law-practice/case-law-appeals/recent/t930823fu1.html#q%22T 0823%2F93%22](http://www.epo.org/law-practice/case-law-appeals/recent/t930823fu1.html#q%22T%20823%2F93%22) (Accessed: 4 June 2018).



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T 0823/93 (Charge palettisée) of 25.6.1996

European Case Law Identifier:	ECLI:EP:BA:1996:T082393.19960625
Date de la décision :	25 Juin 1996
Numéro de l'affaire :	T 0823/93
Numéro de la demande :	87401242.0
Classe de la CIB :	B65B 53/02
Langue de la procédure :	FR
Distribution :	B
Téléchargement et informations complémentaires :	<input type="checkbox"/> Texte de la décision en FR (PDF, 7.768K)
	Les documents concernant la procédure de recours sont disponibles dans le > Registre
Informations bibliographiques disponibles en : FR	
Versions :	Unpublish > Unpubli v2
Titre de la demande :	Procédé et installation pour l'emballage d'une charge palettisée une housse en matière plastique thermorétractable
Nom du demandeur :	NEWTEC INTERNATIONAL
Nom de l'opposant :	MSK-Verpackungssysteme
Chambre :	3.2.04
Sommaire :	-
Dispositions juridiques pertinentes :	> European Patent Convention 1973 Art 54(2)

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EPO (1997a) T292/93. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t930292fu1.html> (Accessed: 4 June 2018).



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T 0292/93 () of 13.2.1997

European Case Law Identifier:	ECLI:EP:BA:1997:T029293.19970213
Date de la décision :	13 Février 1997
Numéro de l'affaire :	T 0292/93
Numéro de la demande :	86901428.2
Classe de la CIB :	B41F 13/12
Langue de la procédure :	FR
Distribution :	C

Téléchargement et informations complémentaires :

Texte de la décision en FR (PDF, 903.933K)


Les documents concernant la procédure de recours sont disponibles dans le [Registre](#)

Informations bibliographiques disponibles en : FR

Versions : Unpublish

Titre de la demande :	Procédé et dispositif de positionnement d'objets les uns par rapport aux autres, en particulier des rouleaux d'impression de couleurs dans une presse rotative offset
Nom du demandeur :	CALGRAPH
Nom de l'opposant :	BOBST S. A. MAN Roland Druckmaschinen AG Web Printing Controls Co., Inc. Heidelberger Druckmaschinen AG
Chambre :	3.2.05
Sommaire :	-

Dispositions juridiques pertinentes : [European Patent Convention 1973 Art 56](#)



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EPO (1997b) T809/95. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t950809du1.html> (Accessed: 4 June 2018).



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T 0809/95 () of 29.4.1997

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European Case Law Identifier:	ECLI:EP:BA:1997:T080995:19970429
Datum der Entscheidung:	29 April 1997
Aktenzeichen:	T 0809/95
Anmeldenummer:	90111947.9
IPC-Klasse:	B65D 1/02
Verfahrenssprache:	DE
Verteilung:	B
Download und weitere Informationen:	<input type="checkbox"/> Text der Entscheidung in DE (PDF, 50.896K) Alle Dokumente zum Beschwerdeverfahren finden Sie im Register
Bibliografische Daten verfügbar in:	DE
Fassungen:	Unpublished
Bezeichnung der Anmeldung:	Faltbare Kunststoff-Flasche
Name des Anmelders:	Düring AG
Name des Einsprechenden:	01) Alpla Werke, Alwin Lehner KG 02) Migros-Genossenschafts-Bund
Kammer:	3.2.01
Leitsatz:	-
Relevante Rechtsnormen:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54(2) > European Patent Convention 1973 Art 56 > European Patent Convention 1973 Art 87(1)
Schlagwörter:	Prioritätsrecht - bejaht, dieselbe Erfindung Offenkundige Vorbenutzung durch Marktakzeptanztest -

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EPO (1998b) *T348/94*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t940348eu1.html> (Accessed: 4 June 2018).



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T 0348/94 () of 21.10.1998

European Case Law Identifier:	ECLI:EP:BA:1998:T034894.19981021
Date of decision:	21 October 1998
Case number:	T 0348/94
Application number:	88105180.9
IPC class:	C23C 14/08
Language of proceedings:	EN
Distribution:	C
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 40.275K)
	Documentation of the appeal procedure can be found in the Register
	Bibliographic information is available in: EN
	Versions: Unpublished
Title of application:	A production method of superconductive thin film and a device thereof
Applicant name:	Sumitomo Electric Industries Limited
Opponent name:	Siemens AG
Board:	3.2.02
Headnote:	-
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 56 > European Patent Convention 1973 Art 104
Keywords:	Inventive step - after amendment (yes)

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EPO (1998f) T901/95. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t950901du1.html> (Accessed: 4 June 2018).



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Große Beschwerdekammer

T 0901/95 () of 29.10.1998

European Case Law Identifier:	ECLI:EP:BA:1998:T090195:19981029
Datum der Entscheidung:	29 October 1998
Aktenzeichen:	T 0901/95
Anmeldenummer:	87100983.3
IPC-Klasse:	H02J 3/38
Verfahrenssprache:	DE
Verteilung:	B
Download und weitere Informationen:	<input type="checkbox"/> Text der Entscheidung in DE (PDF, 52.344K) Alle Dokumente zum Beschwerdeverfahren finden Sie im Register
	Bibliografische Daten verfügbar in: DE
	Fassungen: Unpublished
Bezeichnung der Anmeldung:	Verfahren zum dauernden Parallelauf eines Synchronwellengenerators mit mindestens einem Dieselmotor eines Hilfsdieselaggregates
Name des Anmelders:	STN Systemtechnik Nord GmbH
Name des Einsprechenden:	Siemens AG
Kammer:	3.5.02
Leitsatz:	-
Relevante Rechtsnormen:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 52 > European Patent Convention 1973 Art 54 > European Patent Convention 1973 Art 56



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EPO (2000a) T165/96. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t960165fu1.html> (Accessed: 4 June 2018).



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T 0165/96 (Délavage/CAYLA) of 30.5.2000

European Case Law Identifier:	ECLI:EP:BA:2000:T016596:20000530
Date de la décision :	30 Mai 2000
Numéro de l'affaire :	T 0165/96
Numéro de la demande :	90901828.5
Classe de la CIB :	C11D 11/00
Langue de la procédure :	FR
Distribution :	C
Téléchargement et informations complémentaires :	<input type="checkbox"/> Texte de la décision en FR (PDF, 33.054K) Les documents concernant la procédure de recours sont disponibles dans le Registre Informations bibliographiques disponibles en : FR Versions : Unpublish
Titre de la demande :	Procédé de délavage hétérogène d'articles à base de coton tein
Nom du demandeur :	CAYLA
Nom de l'opposant :	Novo Nordisk A/S
Chambre :	3.3.06
Sommaire :	-
Dispositions juridiques pertinentes :	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54(1) > European Patent Convention 1973 Art 54(2) > European Patent Convention 1973 Art 56 > European Patent Convention 1973 Art 423(2)



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European Case Law Identifier: ECLI:EP:BA:2000:T003796.20000207

Date of decision: 07 February 2000

Case number: T 0037/96

Application number: 90915864.4

IPC class: D21C 7/14

Language of proceedings: EN

Distribution: C

Download and more information: Decision text in EN (PDF, 30.061K)

Documentation of the appeal procedure can be found in the [Register](#)

Bibliographic information is available in: EN

Versions: Unpublished

Title of application: Method and apparatus to displace spent liquors in a digester

Applicant name: BELOIT TECHNOLOGIES, INC.

Opponent name: Voest-Alpine Industrieanlagenbau Gesellschaft m.b.H.


Board: 3.3.06

Headnote: -

Relevant legal provisions: [> European Patent Convention 1973 Art 54](#)
[> European Patent Convention 1973 Art 56](#)

Keywords: Public prior use and public availability of written disclosure - not

EPO (2000c) T478/99. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t990478eu1.html> (Accessed: 4 June 2018).



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T 0478/99 () of 7.12.2000

European Case Law Identifier:	ECLI:EP:BA:2000:T047899:20001207
Date of decision:	07 December 2000
Case number:	T 0478/99
Application number:	89904968.8
IPC class:	A62B 7/00
Language of proceedings:	EN
Distribution:	C
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 75.979K)
Documentation of the appeal procedure can be found in the Register	
Bibliographic information is available in: EN	
Versions:	Unpublished
Title of application:	Crew oxygen mask with pneumatic comfort adjustment
Applicant name:	BE Intellectual Property, Inc.
Opponent name:	INTERTECHNIQUE SA
Board:	3.2.04
Headnote:	-
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 107 > European Patent Convention 1973 R 20(3) > European Patent Convention 1973 R 61
Keywords:	Admissibility of the appeal - yes Public prior use - no

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EPO (2000d) T838/97. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t970838eu1.html> (Accessed: 4 June 2018).

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The main content area features a sidebar on the left titled 'Search decisions' with a sub-section 'Recent decisions' listing years from 2018 down to 2000. The central part of the page displays the title 'T 0838/97 (Translational inhibition/RESEARCH FOUNDATION) of 14.11.2000'. To the right of the title are 'Print' and 'Share' icons.

The decision details are presented in a table-like format:

European Case Law Identifier:	ECLI:EP:BA:2000:T083897:20001114
Date of decision:	14 November 2000
Case number:	T 0838/97
Application number:	84112647.7
IPC class:	C12N 15/11
Language of proceedings:	EN
Distribution:	B
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 63.188K) Documentation of the appeal procedure can be found in the Register
Bibliographic information is available in:	EN
Versions:	Unpublished
Title of application:	Regulation of gene expression by employing translational inhibition utilizing mRNA interfering complementary RNA
Applicant name:	THE RESEARCH FOUNDATION OF STATE UNIVERSITY OF NEW YORK
Opponent name:	Calgene Inc.
Board:	3.3.04
Headnote:	-

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At the bottom left of the page, there is a link to the 'Enlarged Board of Appeal'.

EPO (2001b) T1212/97. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t971212eu1.html> (Accessed: 4 June 2018).



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Procedure

T 1212/97 (Immunoglobulin preparations/GENENTECH) of 14.5.2001

Print
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European Case Law Identifier:	ECLI:EP:BA:2001:T121297.20010514
Date of decision:	14 May 2001
Case number:	T 1212/97
Application number:	84302368.0
IPC class:	C12N 15/13
Language of proceedings:	EN
Distribution:	B
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 82.978K) <p style="font-size: small; margin-top: 5px;">Documentation of the appeal procedure can be found in the Register</p>
Bibliographic information is available in: EN	
Versions: Unpublished	
Title of application:	Recombinant immunoglobulin preparations, methods for their preparation, DNA sequences, expression vectors and recombinant host cells therefor
Applicant name:	Genentech, Inc., et al
Opponent name:	Bristol-Myers Company Roche Diagnostics GmbH Protein Design Ortho Pharmaceutical Corp. Celltech Limited



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EPO (2003) T947/99. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t990947eu1.html> (Accessed: 4 June 2018).



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Procedure

T 0947/99 (Confectionary/UNILEVER) of 27.11.2003

 Print
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European Case Law Identifier:	ECLI:EP:BA:2003:T094799.20031127
Date of decision:	27 November 2003
Case number:	T 0947/99
Application number:	93921860.8
IPC class:	A23G 1/20
Language of proceedings:	EN
Distribution:	B
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 97.256K)
	Documentation of the appeal procedure can be found in the Register
	Bibliographic information is available in: EN
	Versions: Unpublished
Title of application:	Production of confectionery
Applicant name:	UNILEVER PLC, et al
Opponent name:	NESTEC S.A.
Board:	3.3.02
Headnote:	-
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54 > European Patent Convention 1973 Art 56 > European Patent Convention 1973 Art 69 > European Patent Convention 1973 Art 83



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EPO (2004c) T50/02. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t020050eu1.html> (Accessed: 4 June 2018).



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T 0050/02 (Pentafluoroethane refrigerant/DAIKIN) of 29.6.2004

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European Case Law Identifier:	ECLI:EP:BA:2004:T005002.20040629		
Date of decision:	29 June 2004		
Case number:	T 0050/02		
Application number:	94908493.3		
IPC class:	C07C 19/08		
Language of proceedings:	EN		
Distribution:	B		
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 138.661K) Documentation of the appeal procedure can be found in the Register		
	Bibliographic information is available in: EN		
	<table style="width: 100%; border: none;"> <tr> <td style="border: none;">Versions:</td> <td style="border: none; text-align: right;">Unpublished</td> </tr> </table>	Versions:	Unpublished
Versions:	Unpublished		
Title of application:	Process for producing 1,1,1,2,2-pentafluoroethane, process for producing 2,2-dichloro-1,1,1-trifluoroethane, and method of purifying 1,1,1,2,2-pentafluoroethane		
Applicant name:	DAIKIN INDUSTRIES, LIMITED		
Opponent name:	Solvay (Société Anonyme)		
Board:	3.3.01		
Headnote:	-		
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54(1) > European Patent Convention 1973 Art 54(2) 		

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EPO (2008a) *T1875/06*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t061875eu1.html> (Accessed: 4 June 2018).



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Procedure

T 1875/06 (Barley/SAPORO BREWERIES) of 8.1.2008

European Case Law Identifier:	ECLI:EP:BA:2008:T187506.20080108
Date of decision:	08 January 2008
Case number:	T 1875/06
Application number:	00953438.9
IPC class:	A01H 5/00
Language of proceedings:	EN
Distribution:	C
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 35.117K) Documentation of the appeal procedure can be found in the Register
Bibliographic information is available in:	EN
Versions:	Unpublished
Title of application:	Construction of barley with decreased gel protein content
Applicant name:	SAPORO BREWERIES LTD.
Opponent name:	-
Board:	3.3.04
Headnote:	-
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54(2) > European Patent Convention 1973 Art 56 > European Patent Convention 1973 Art 111(1)
Keywords:	Strict standard of proof in respect of an internet disclosure

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EPO (2009a) T1309/07. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t071309du1.html> (Accessed: 4 June 2018).



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T 1309/07 () of 23.6.2009

Drucken
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European Case Law Identifier:	ECLI:EP:BA:2009:T130907:20090623
Datum der Entscheidung:	23 Juni 2009
Aktenzeichen:	T 1309/07
Anmeldenummer:	00111733.2
IPC-Klasse:	F02F 3/22
Verfahrenssprache:	DE
Verteilung:	B
Download und weitere Informationen:	<input type="checkbox"/> Text der Entscheidung in DE (PDF, 41.124K) Alle Dokumente zum Beschwerdeverfahren finden Sie im Register Bibliografische Daten verfügbar in: DE Fassungen: Unpublished
Bezeichnung der Anmeldung:	Kolben für einen Verbrennungsmotor
Name des Anmelders:	KS Kolbenschmidt GmbH
Name des Einsprechenden:	Mahle International GmbH Federal-Mogul Holding Deutschland GmbH
Kammer:	3.2.04
Leitsatz:	-
Relevante Rechtsnormen:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54 > European Patent Convention 1973 Art 56 > European Patent Convention 1973 Art 99 > European Patent Convention 1973 R 55(c)

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EPO (2009b) *T1464/05*. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t051464eu1.html> (Accessed: 4 June 2018).



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T 1464/05 (Hydrogen-absorbing composition/PRYSMIAN) of 14.5.2009

Print
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European Case Law Identifier:	ECLI:EP:BA:2009:T146405.20090514
Date of decision:	14 May 2009
Case number:	T 1464/05
Application number:	94109180.3
IPC class:	G02B 6/44
Language of proceedings:	EN
Distribution:	B
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 92.423K) Documentation of the appeal procedure can be found in the Register
	Bibliographic information is available in: EN
	Versions: Unpublished
Title of application:	Hydrogen-absorbing composition for optical fiber cables and optical fiber cables incorporation such compositions
Applicant name:	Prysmian S.p.A.
Opponent name:	Alcatel Kabel Beteiligungs-AG
Board:	3.4.02
Headnote:	-
Relevant legal provisions:	European Patent Convention Art 123(2) European Patent Convention 1973 Art 54(2)

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EPO (2009c) T1829/06. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t061829eu1.html> (Accessed: 4 June 2018).



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T 1829/06 () of 10.11.2009

European Case Law Identifier:	ECLI:EP:BA:2009:T182906.20091110
Date of decision:	10 November 2009
Case number:	T 1829/06
Application number:	99124055.7
IPC class:	H01L 31/048
Language of proceedings:	EN
Distribution:	D
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 32.290K) Documentation of the appeal procedure can be found in the Register Bibliographic information is available in: EN Versions: Unpublished
Title of application:	Photovoltaic module and power generation system
Applicant name:	KANEKA CORPORATION
Opponent name:	SCHOTT Solar GmbH
Board:	3.4.03
Headnote:	-
Relevant legal provisions:	<ul style="list-style-type: none"> > European Patent Convention 1973 Art 54(1) > European Patent Convention 1973 Art 54(2) > European Patent Convention 1973 Art 56
Keywords:	Public prior use (free)

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EPO (2010) T1168/09. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t091168du1.html> (Accessed: 4 June 2018).



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Große Beschwerdekammer

T 1168/09 () of 15.10.2010

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European Case Law Identifier:	ECLI:EP:BA:2010:T116809:20101015
Datum der Entscheidung:	15 October 2010
Aktenzeichen:	T 1168/09
Anmeldenummer:	02023117.1
IPC-Klasse:	F04D 25/06
Verfahrenssprache:	DE
Verteilung:	C
Download und weitere Informationen:	Text der Entscheidung in DE (PDF, 30.672K) Alle Dokumente zum Beschwerdeverfahren finden Sie im Register Bibliografische Daten verfügbar in: DE Fassungen: Unpublished
Bezeichnung der Anmeldung:	Lüfter
Name des Anmelders:	ebm-papst St. Georgen GmbH & Co. KG
Name des Einsprechenden:	HKR Climatec GmbH Thorsten Meyer
Kammer:	3.2.04
Leitsatz:	-
Relevante Rechtsnormen:	European Patent Convention Art 100(b)
Schlagwörter:	Ausführbarkeit der Erfindung - bejaht Offenkundige Vorbenutzung - Lastenheft, Pflichtenheft, Lieferung einer Vielzahl von Kfz-Teilen an einen Kfz-



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T 2339/09 () of 17.11.2011

European Case Law Identifier:	ECLI:EP:BA:2011:T233909.20111117
Datum der Entscheidung:	17 November 2011
Aktenzeichen:	T 2339/09
Anmeldenummer:	06023921.7
IPC-Klasse:	B22D 46/00 G09F 3/02
Verfahrenssprache:	DE
Verteilung:	D
Download und weitere Informationen:	<input type="checkbox"/> Text der Entscheidung in DE (PDF, 30.059K) Alle Dokumente zum Beschwerdeverfahren finden Sie im Register
	Bibliografische Daten verfügbar in: DE
	Fassungen: Unpublished
Bezeichnung der Anmeldung:	Verfahren zur Herstellung eines gegossenen Bauteils mit einer Markierung, ein Bauteil und eine Gruppe von Bauteilen
Name des Anmelders:	SIEMENS AKTIENGESELLSCHAFT
Name des Einsprechenden:	-
Kammer:	3.2.03
Leitsatz:	-
Relevante Rechtsnormen:	> European Patent Convention Art 56
Schlagwörter:	Öffentliche Zugänglichkeit eines im Internet gefundenen Dokuments (nicht)

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T 1553/06 (Public availability of documents on the World Wide Web/PHILIPS) of 12.3.2012

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European Case Law Identifier:	ECLI:EP:BA:2012:T155306.20120312
Date of decision:	12 March 2012
Case number:	T 1553/06
Application number:	00200326.7
IPC class:	H04N 9/16
Language of proceedings:	EN
Distribution:	B
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 146.854K) <p style="font-size: small; margin-top: 5px;">Documentation of the appeal procedure can be found in the Register</p> <p style="font-size: small; margin-top: 5px;">Bibliographic information is available in: EN</p> <p style="font-size: small; margin-top: 5px;">Versions: Unpublished</p>
Title of application:	Display device
Applicant name:	Koninklijke Philips Electronics N.V.
Opponent name:	DSM IP Assets B.V.
Board:	3.5.04
Headnote:	1. An opposition filed within the framework of a test case is not inadmissible for that sole reason, provided that the prosecution of the proceedings thereby instituted is contentious because the parties defend mainly opposing positions. (See point 1.3)



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T 0002/09 (Public availability of an e-mail transmitted via the Internet/PHILIPS ... of 12.3.2012)

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European Case Law Identifier:	ECLI:EP:BA:2012:T000209.20120312
Date of decision:	12 March 2012
Case number:	T 0002/09
Application number:	02077838.7
IPC class:	H04N 9/16
Language of proceedings:	EN
Distribution:	B
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 250.167K)
	Documentation of the appeal procedure can be found in the Register
	Bibliographic information is available in: EN
	Versions: Unpublished
Title of application:	Display device
Applicant name:	Koninklijke Philips Electronics N.V.
Opponent name:	DSM IP Assets B.V.
Board:	3.5.04
Headnote:	1. An opposition filed within the framework of a test case is not inadmissible for that sole reason, provided that the prosecution of the proceedings thereby instituted is contentious because the parties defend mainly opposing positions. (See point 1.3.3)



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- 2002 decisions
- 2001 decisions
- 2000 decisions


Enlarged Board of Appeal

Procedure

T 0990/09 (Cell culture medium/BAXTER) of 3.7.2012

European Case Law Identifier:	ECLI:EP:BA:2012:T099009:20120703
Date of decision:	03 July 2012
Case number:	T 0990/09
Application number:	00969319.3
IPC class:	C12N 5/00 C12N 5/06
Language of proceedings:	EN
Distribution:	C
Download and more information:	<input type="checkbox"/> Decision text in EN (PDF, 85.018K) Documentation of the appeal procedure can be found in the > Register
Bibliographic information is available in: EN	
Versions:	Unpublished
Title of application:	Medium for the protein-free and serum-free cultivation of cells
Applicant name:	Baxter Aktiengesellschaft
Opponent name:	Merck Serono SA, Maxygen Inc., Sigma-Aldrich Co., Kerry Ingredients (UK) Limited, Novo Nordisk A/S, F.Hoffmann-La Roche AG, Novartis AG, Campina Nederland Holding B.V.
Board:	3.3.08

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EPO (2014) T286/10. Available at: <http://www.epo.org/law-practice/case-law-appeals/recent/t100286fu1.html> (Accessed: 4 June 2018).



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Grande chambre de recours

T 0286/10 (Sécurisation d'un accès à une ressource numérique/BOUYGUES) of 21.5.2014

European Case Law Identifier:
ECLI:EP:BA:2014:T028610.20140521

Date de la décision :
21 Mai 2014

Numéro de l'affaire :
T 0286/10

Numéro de la demande :
02803846.1

Classe de la CIB :
G06F 12/14

Langue de la procédure :
FR

Distribution :
C

Téléchargement et informations complémentaires :
 Texte de la décision en FR (PDF, 376.532K)

Les documents concernant la procédure de recours sont disponibles dans le [Registre](#)

Informations bibliographiques disponibles en :
FR

Versions :
Unpublish

Titre de la demande :
PROCEDE DE SECURISATION D UN ACCES A UNE RESSOURCE NUMERIQUE

Nom du demandeur :
Bouygues Telecom


Nom de l'opposant :
Pointsec Mobile Technologies AB

Chambre :
3.5.06

Sommaire :
-

Dispositions juridiques pertinentes :

[European Patent Convention 1973 Art.56](#)
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[http://documents.epo.org/projects/babylon/eponet.nsf/0/029F2DA107DD667FC125825F005311DA/\\$File/EPC_16th_edition_2016_de.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/029F2DA107DD667FC125825F005311DA/$File/EPC_16th_edition_2016_de.pdf) (Accessed: 8 August 2018).

Regel Rule Règle	Ausführungsordnung	Implementing Regulations	Règlement d'exécution
	Tag des Inkrafttretens 01.07.2016	Date of entry into force 01.07.2016	Date d'entrée en vigueur 01.07.2016
	Das Europäische Patent- übereinkommen und die Gebührenordnung wurden seit der Publikation der 16. Auflage der Textausgabe (Juni 2016) durch folgende Beschlüsse des Verwaltungsrats geändert:	The European Patent Convention and the Rules relating to Fees have been amended by the following decisions of the Administrative Council since the publication of the 16th edition (June 2016):	La Convention sur le brevet européen et le règlement relatif aux taxes ont été modifiés par les décisions suivantes du Conseil d'administration depuis la publication de la 16 ^e édition (juin 2016):
R. 9(1)	Regel 9(1) geändert durch Beschluss CA/D 6/16 vom 30.06.2016 (ABI. EPA 2016, A90)	Rule 9(1) amended by decision CA/D 6/16 of 30.06.2016 (OJ EPO 2016, A90)	Règle 9(1) modifiée par décision CA/D 6/16 du 30.06.2016 (JO OEB 2016, A90)
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R. 12a	Regel 12a eingefügt durch Beschluss CA/D 6/16 vom 30.06.2016 (ABI. EPA 2016, A90)	Rule 12a inserted by decision CA/D 6/16 of 30.06.2016 (OJ EPO 2016, A90)	Règle 12bis insérée par décision CA/D 6/16 du 30.06.2016 (JO OEB 2016, A90)
R. 12b	Regel 12b eingefügt durch Beschluss CA/D 6/16 vom 30.06.2016 (ABI. EPA 2016, A90)	Rule 12b inserted by decision CA/D 6/16 of 30.06.2016 (OJ EPO 2016, A90)	Règle 12ter insérée par décision CA/D 6/16 du 30.06.2016 (JO OEB 2016, A90)
R. 12c	Regel 12c eingefügt durch Beschluss CA/D 6/16 vom 30.06.2016 (ABI. EPA 2016, A90)	Rule 12c inserted by decision CA/D 6/16 of 30.06.2016 (OJ EPO 2016, A90)	Règle 12quater insérée par décision CA/D 6/16 du 30.06.2016 (JO OEB 2016, A90)
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R. 13	Regel 13 geändert durch Beschluss CA/D 6/16 vom 30.06.2016 (ABI. EPA 2016, A90)	Rule 13 amended by decision CA/D 6/16 of 30.06.2016 (OJ EPO 2016, A90)	Règle 13 modifiée par décision CA/D 6/16 du 30.06.2016 (JO OEB 2016, A90)
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	Tag des Inkrafttretens 01.11.2016	Date of entry into force 01.11.2016	Date d'entrée en vigueur 01.11.2016
R. 147	Regel 147 (1) bis (3) geändert durch Beschluss CA/D 10/15 vom 14.10.2015 (ABI. EPA 2015, A83) bereits in Kursivschrift in der 16. Auflage integriert	Rule 147(1) to (3) amended by decision CA/D 10/15 of 14.10.2015 (OJ EPO 2015, A83) already integrated in italics in the 16 th edition	Règle 147(1) à (3) modifiée par décision CA/D 10/15 du 14.10.2015 (JO OEB 2015, A83) déjà intégré en italique dans la 16 ^e édition

EPO (2018a) *Antrag auf Erteilung eines europäischen Patents*. Available at: [documents.epo.org/projects/babylon/eponet.nsf/0/5C683C367A8DFBC7C12577F400449FD8/\\$FILE/epo_form_1001_03_18_editable.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/5C683C367A8DFBC7C12577F400449FD8/$FILE/epo_form_1001_03_18_editable.pdf) (Accessed: 23 June 2018).

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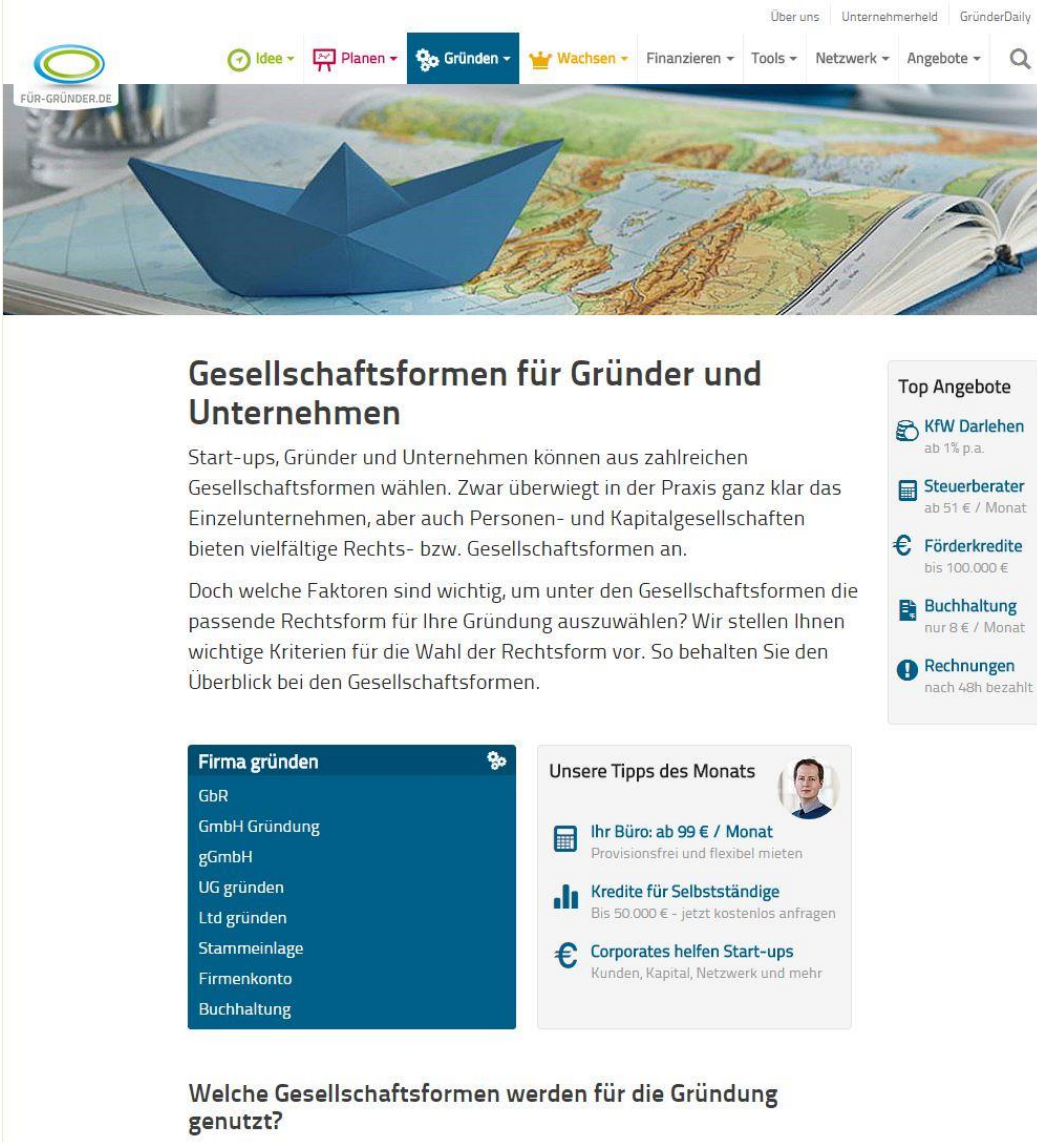
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Gesellschaftsformen für Gründer und Unternehmen

Start-ups, Gründer und Unternehmen können aus zahlreichen Gesellschaftsformen wählen. Zwar überwiegt in der Praxis ganz klar das Einzelunternehmen, aber auch Personen- und Kapitalgesellschaften bieten vielfältige Rechts- bzw. Gesellschaftsformen an.

Doch welche Faktoren sind wichtig, um unter den Gesellschaftsformen die passende Rechtsform für Ihre Gründung auszuwählen? Wir stellen Ihnen wichtige Kriterien für die Wahl der Rechtsform vor. So behalten Sie den Überblick bei den Gesellschaftsformen.

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Howe, J. (2006) *The rise of crowdsourcing*, Wired Magazine. Available at: <https://www.wired.com/2006/06/crowds/> (Accessed: 8 August 2018).

JEFF HOWE IDEAS 06.01.06 12:00 PM

THE RISE OF CROWDSOURCING



von der Lippe, P. (2011) *Wie groß muss meine Stichprobe sein, damit sie repräsentativ ist?* Available at: <http://von-der-lippe.org/dokumente/Wieviele.pdf> (Accessed: 31 March 2018).

**Wie groß muss meine Stichprobe sein, damit sie repräsentativ ist?
Wie viele Einheiten müssen befragt werden?
Was heißt "Repräsentativität"?**

von

Peter von der Lippe (Februar 2011)

Stichworte:

Stichprobenumfang, Stichprobenplanung, Repräsentativität, geschichtete Stichprobe, Stichprobenfehler, Zufallsauswahl, Antwortausfälle bei Stichproben

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dem um die *Schätzung des Gesamtmittelwerts* \bar{x} als Mittel aus allen diesen Schichtmittelwerten $\bar{x}_1, \bar{x}_2, \dots, \bar{x}_k$.⁴

In Abschn. 3 werden darüber hinaus aber auch noch einige weitere interessante Zusammenhänge betrachtet, die für geschichtete Stichproben gelten. Andere, z.T. erheblich kompliziertere Stichprobendesigns, wie Klumpenstichprobe oder mehrstufige Stichproben werden in diesem recht elementaren Text allerdings nicht behandelt.

In Abschn. 4 wird auf den Begriff der *Repräsentativität* (ein Ausdruck der Alltagssprache, nicht der Statistik) und im Abschnitt 5 abschließend auf einige Probleme im Zusammenhang mit Fehlern, Antwortausfällen und Hochrechnungen (zur nachträglichen Anpassungen der Struktur der Stichprobe an die Struktur der Grundgesamtheit) eingegangen.

Der Begriff "Repräsentativität" (ein ausgesprochen nicht-statistischer Sprachgebrauch) ist nicht nur unklar, sondern er verführt auch zu offensichtlich unhaltbaren und rein gefühlsmäßigen Schlüssen nach der Art: "nur 100 Befragte kann nicht repräsentativ sein". Statt von "Repräsentativität" zu sprechen ist es in der Fachterminologie üblich (und, wie gezeigt, auch allein sinnvoll), das Konzept des "Stichprobenfehlers" (SF) bei der Beurteilung des Stichprobenumfangs n ins Spiel zu bringen. Wir beginnen deshalb im Abschn. 1 mit Formeln, in denen n aus SF abgeleitet ist.⁵ Dabei soll zunächst noch der problematische Begriff der "Repräsentativität" (bis Abschnitt 4) zurückgestellt werden.

1. Die Lehrbuchformeln für eine einfache Stichprobe

Als Formel für den mindestens erforderlichen Stichprobenumfang n (etwa bei einer geplanten Befragung) findet man meist⁶

$$(1) \quad n \geq \frac{z^2 \sigma^2}{e^2} = \left(\frac{z\sigma}{e} \right)^2,$$

worin z Ausdruck der Sicherheit, wie z.B. 90% oder 95% ist, bzw. der Irrtumswahrscheinlichkeit (das Signifikanzniveau) darstellt, was dann entsprechend 10% oder 5% wäre. Der Betrachtung liegt in der Regel die Normalverteilung zugrunde und die z -Werte sind dann (bei der hier üblichen Annahme eines symmetrischen zweiseitig begrenzten Intervalls):

Sicherheit	z
90%	1,6449
95%	1,96 \approx 2
99%	2,5758

Die Größe σ^2 stellt die Varianz des interessierenden Merkmals X dar und e (error) die absolute Genauigkeit (etwa $e = 100$, wenn eine Genauigkeit des zu schätzenden Mittelwerts μ der Grundgesamtheit in Höhe von ± 100 € gewünscht wird). Weil es bei einer Stichprobenbefragung in der Regel eine große Zahl von abgefragten Merkmalen gibt (die im unterschiedlichen Maße streuen), und über die Grundgesamtheit aus der die Stichprobe gezogen werden soll meist nichts bekannt ist, stellen sich gleich zwei Fragen

1. Welches meiner Merkmale soll ich bei σ^2 zu Grunde legen?

⁴ Das war mir bislang nicht so bewusst und erklärt auch dass man sowohl die paradox erscheinenden Ergebnisse von Abschn. 2 als auch ganz andere Ergebnisse mit den Formeln der geschichteten Stichprobe gleichermaßen als logische Konsequenz der betreffenden (unterschiedlichen) Aufgabenstellungen erhält.

⁵ Der erforderliche Stichprobenumfang hängt u.a. von der Streuung des interessierenden Merkmals in der Grundgesamtheit ab. Im Extremfall einer Varianz von Null (lauter gleiche Einheiten) reicht eine Stichprobe von $n = 1$ aus.

⁶ Zu Varianten Formel vgl. Anhang 1.

2. Welchen Zahlenwert kann man für σ^2 ansetzen, wo man doch den wahren Wert in der Grundgesamtheit nicht kennt?

Zu 1 gibt es wohl keine brauchbare Antwort. Man könnte argumentieren, es solle ein besonders "wichtiges" Merkmal sein, oder es solle, um sicher zu gehen, die Varianz desjenigen Merkmals sein, das besonders stark streut. Was Frage 2 betrifft, so wird gern Zuflucht genommen zu einer noch zu besprechenden Formel (Gleichungen 2 und 5) mit der man zur Sicherheit einen meist viel zu großen Wert für n erhält. Besser ist es, wenn man in der angenehmen Situation ist, eine zweite oder dritte Befragung der gleichen Art (also eine Panelbefragung) durchführen zu können, dass man dann (versuchsweise) den Wert der ersten oder zweiten (also jeweils der letzten) Befragungs-"Welle" nehmen kann. Verfügt man nicht über solche Daten kann es – wie im Anhang 1 gezeigt wird – evtl. besser sein, mit Annahmen über den relativen statt dem absoluten Fehler (e) und über den Variationskoeffizient statt über σ (wie in Gl. 1) zu operieren.

In jedem Fall wird man statt der wahren Varianz σ^2 eine geschätzte, angenommene oder aufgrund früherer Erhebungen zu vermutende Varianz $\hat{\sigma}^2$ einsetzen. Die Aussage von Gl. 1 ist intuitiv verständlich. Danach hängt die Größe n ab von

1. der quadrierten Genauigkeit, definiert aufgrund des absoluten Fehlers⁷ e (große Genauigkeit heißt kleiner Fehler, so dass die Genauigkeit quasi $1/e$ ist),
2. der Sicherheit, der jeweils ein bestimmter Wert z zugeordnet ist und
3. der Homogenität der Grundgesamtheit σ^2 .

Mit dem "Fehler" e ist hier die halbe Breite des Konfidenzintervalls gemeint. Der Begriff ist jedoch nicht eindeutig. Unter dem "Stichprobenfehler" (SF) wird üblicherweise (und so auch im Folgenden) die Standardabweichung $\sigma_{\bar{x}}$, bzw. die (aufgrund der Stichprobe) geschätzte Standardabweichung $\hat{\sigma}_{\bar{x}}$ der Stichprobenverteilung (Verteilung aller möglichen Stichproben vom Umfang n , die man aus einer Grundgesamtheit vom Umfang N ziehen kann) von \bar{x} verstanden und e ist dann das Produkt $z \cdot \sigma_{\bar{x}}$. Das Konfidenzintervall für den mit \bar{x} geschätzten Mittelwert μ der Grundgesamtheit hat bekanntlich bei einer von der Irrtumswahrscheinlichkeit (= Signifikanzniveau) α abhängigen Signifikanzschranke z_α die Grenzen⁸

$\bar{x} \pm z_\alpha \cdot \hat{\sigma}_{\bar{x}} = \bar{x} \pm e$ und der Stichprobenfehler (SF) ist gegeben mit

$$(1a) \quad \hat{\sigma}_{\bar{x}} = \frac{\hat{\sigma}}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}} \text{ bzw. bei } N \rightarrow \infty$$

$$(1b) \quad \hat{\sigma}_{\bar{x}} = \frac{\hat{\sigma}}{\sqrt{n}}, \text{ was wie Gl. 1 darauf beruht, dass } e = z \hat{\sigma}_{\bar{x}} = z \frac{\hat{\sigma}}{\sqrt{n}} \text{ nach } n \text{ aufgelöst}$$

wurde. Es ist unmittelbar einsichtig, dass n umso kleiner sein kann, je homogener die Grundgesamtheit ist. Sind dort alle Elemente bezüglich des Merkmals X gleich, dann ist $\sigma_x^2 = \sigma^2 = 0$ und es reicht, wie bereits gesagt, eine Stichprobe von $n = 1$ zu ziehen, um die Grundgesamtheit komplett und mit Sicherheit (Wahrscheinlichkeit 1) zu kennen. Gl. (1) zeigt, dass n direkt proportional zu z^2 und σ^2 ist. Eine größere Sicherheit und eine weniger homogene Grundge-

⁷ e ist die halbe Länge des (symmetrischen zweiseitigen) Schwankungsintervalls (bei Verwendung von σ^2), bzw. Konfidenzintervalls wenn für σ^2 der entsprechende Schätzwert aufgrund der Stichprobe verwendet wird. Die entsprechenden Formeln (1) bis (4) beruhen alle auf einer einfachen Umformung der Gleichungen für e .

⁸ Im Folgenden, wie auch in Gl. 1 schreiben wir der Einfachheit halber nur z statt z_α . Der (absolute) Stichprobenfehler SF bestimmt nicht nur die Breite des Konfidenzintervalls sondern auch die Testentscheidung bei Hypothesen über μ .

samtheit verlangen eine größere Stichprobe. Entsprechend ist n proportional zu $1/e$ (also indirekt proportional zu e), d.h. mehr Genauigkeit (kleineres e , größeres $1/e$) bedeutet größerer Stichprobenumfang.

Das Problem, das mit (1) verbunden ist, ist dass man i.d.R. keine Kenntnisse über die Größenordnung von σ^2 hat (außer $\sigma^2 > 0$), wenn X ein Merkmal ist, das "quantitativ" ist (d.h. metrisch skaliert ist und beliebig viele Abstufungen hat).⁹ Angenehmer ist in dieser Hinsicht ein "qualitatives" Merkmal mit Merkmalsausprägungen, für die meist nicht eine Ordnung existiert (z.B. beim Familienstand ist "ledig" nicht mehr oder "besser" als "verheiratet") und bei denen man sich für die Wahrscheinlichkeit π des Auftretens einer bestimmten dieser Ausprägung interessiert. In diesem Fall tritt $\pi(1-\pi)$ an die Stelle von σ^2 und weil für die Wahrscheinlichkeit π gilt $0 \leq \pi \leq 1$ ist die Varianz hier (im Unterschied zu σ^2) nach oben begrenzt $\pi(1-\pi) \leq 1/4$. Man kann dann n abschätzen weil jetzt σ^2 durch $\pi(1-\pi)$ zu ersetzen ist

$$(2) \quad n \geq \frac{z^2 \pi(1-\pi)}{e^2} \quad \text{und} \quad \frac{z^2 \pi(1-\pi)}{e^2} \leq \frac{1}{4} \cdot \frac{z^2}{e^2}.$$

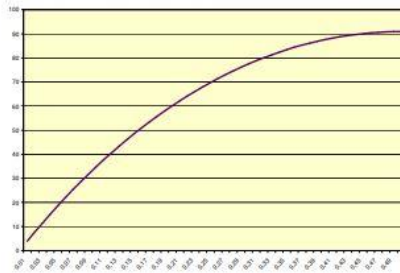
Die meisten Befragungen enthalten neben "quantitativen" Merkmalen auch "qualitative", so dass man sich mit $z^2/4e^2 = (z/2e)^2$ auf der sicheren Seite fühlen kann (vgl. aber auch Anhang 1). Varianten von (1) und (2) sind die Endlichkeit der Grundgesamtheit berücksichtigend¹⁰

$$(3) \quad n \geq \frac{K}{e^2 + \frac{K}{N}} \quad \text{mit} \quad K = z^2 \sigma^2$$

$$(4) \quad n \geq \frac{K^*}{e^2 + \frac{K^*}{N}} \quad \text{mit} \quad K^* = z^2 \pi(1-\pi)$$

Der Einfluss von π auf den Stichprobenumfang n nach Gl. 4 ist erheblich.

π (oder $1-\pi$)	$\pi(1-\pi)$	n
0,05 0,95	0,0475	18,65
0,1 0,9	0,09	34,75
0,2 0,8	0,16	60,15
0,3 0,7	0,21	77,49
0,4 0,6	0,25	87,59



In der nebenstehenden Tabelle (und der Graphik darunter) ist mit $N = 1000$, $e = 0,1$ und $z = 2$ gerechnet worden. Wie man sieht, ist der Zusammenhang nicht linear und der Stichprobenumfang kann *erheblich* kleiner sein, wenn sich die relevanten Anteile um 0,1 (0,9) oder 0,2 (0,8) bewegen statt um 0,5. Es ist auch offensichtlich, dass danach der Stichprobenumfang nach Maßgabe der Varianz $\pi(1-\pi)$ zunimmt, genauso wie dies auch gem. (1) bei zunehmender Varianz σ^2 der Fall ist. Er dürfte bei dieser Art der Abschätzung von n (nach Gl. 2) überhaupt etwas zu groß sein (vgl. auch Anhang 1).

⁹ Man spricht in diesem Fall auch von "heterograd" und bei "qualitativen" (oder "kategorialen") Merkmalen von "homograd".

¹⁰ Es sind die Fälle von Ziehen ohne (statt mit) Zurücklegen (ZoZ statt ZmZ), je nachdem ob eine Endlichkeitskorrektur nicht erforderlich ist (ZmZ) oder erforderlich ist (ZoZ). Mit $N \rightarrow \infty$ strebt (3) gegen (1), (4) gegen (2).

Mit $N \rightarrow \infty$ erhält man K/e^2 bzw. $K*/e^2$ also (1) bzw. (2). Eine beliebte und sehr konservative Abschätzung von n ist mit $\pi(1-\pi) = < 1/4$ die Formel

$$(5) \quad n_{\max} = \frac{z^2}{4e^2 + z^2/N} \text{ bzw. noch einfacher bei einer Sicherheit von etwa 95\%, also } z = 2$$

$$(5a) \quad n \geq \frac{N}{1 + e^2 N}$$

Wir wollen im Folgenden zeigen, was es bedeutet, diese beliebte Formel bei der Planung der Stichprobenumfänge für die einzelnen Schichten einer geschichteten Stichprobe zu benutzen.

2. Planung der Stichprobenumfänge für die Schichten einer geschichteten Stichprobe (mit Formeln für die einfache Stichprobe)

Wendet man für diese Aufgabe Gl. 5a an, so geht man implizit davon aus, dass man über die Varianzen σ_k^2 bzw. $\pi_k(1-\pi_k)$ innerhalb der einzelnen Schichten (z.B. Branchen, Berufsgruppen, Regionen) $k = 1, \dots, K$ keine Kenntnisse besitzt und deshalb zur Sicherheit jeweils der maximal mögliche Wert von $1/4$ (sowie $z = 2$) angenommen werden könnte bzw. sollte. Es gibt dann jedoch einige sonderbare Konsequenzen.

a) Auswahlsatz indirekt proportional zum Schichtumfang

Dividiert man n in Gl. (5a) durch N (bzw. n_k durch den Schichtumfang N_k)¹¹ so erhält man

$$(6) \quad \frac{n}{N} \geq \frac{1}{1 + e^2 N}$$

Tabelle 1 zeigt, was das impliziert, wenn man $z = 2$ (für eine Sicherheit von $\approx 95\%$), $\pi_k(1-\pi_k) = 1/4$ und einen absoluten Fehler von $e = 0,08$ (und damit $e^2 = 0,0064$) annimmt, also mit

$$(6a) \quad \frac{n_k}{N_k} = \frac{1}{1 + 0,0064 \cdot N_k}$$

rechnet. Man erhält eine hyperbolisch fallende Kurve, d.h. mit wachsendem N_k strebt der Auswahlsatz gegen 0. Bei einer kleinen Schicht ist der Auswahlsatz groß und bei großem N_k ist der Auswahlsatz klein. Der Umfang der Teil-Stichprobe n_k strebt mit wachsendem N_k gem. Gl. 2 wegen $z = 2$ gegen $1/e^2 = 1/0,0064 = 156,25$.

Auswahlsatz n_k/N_k in % (und Stichprobenumfang n_k) in Abhängigkeit von N_k

N_k	n_k/N_k in % (bzw. n_k)	N_k	n_k/N_k in % (bzw. n_k)
10	94	2000	7,2 ($n_k = 145$)
50	76 ($n_k = 38$)	3000	4,95 ($n_k = 148,5$)
100	60,9 ($n_k = 61$)	5000	3,03 ($n_k = 151,5$)
200	43,8 ($n_k = 87,7$)	10.000	1,54 ($n_k = 154$)
300	34,2 ($n_k = 102,7$)	20.000	0,775 ($n_k = 155$)
400	28,1 ($n_k = 112,4$)	30.000	0,518 ($n_k = 155,4$)
500	23,8 ($n_k = 119$)	40.000	0,389 ($n_k = 155,64$)
1000	13,5 ($n_k = 135$)	50.000	0,312 ($n_k = 155,76$)

¹¹ Aufteilung der Grundgesamtheit in K Schichten mit den Umfängen N_k (Summation jeweils über $k = 1, \dots, K$) so dass $\sum N_k = N_1 + N_2 + \dots + N_K = N$. Entsprechend wird der Umfang n der Gesamt-Stichprobe auf K Stichproben wie folgt aufgeteilt $\sum n_k = n_1 + n_2 + \dots + n_K = n$.

Lober, A. and Just, C. (2010) *Welche Gesellschaftsform ist die beste für Unternehmensgründer?* Available at: <https://www.gruenderszene.de/allgemein/gesellschaftsformen-fur-die-unternehmensgruendung> (Accessed: 4 June 2018).

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Welche Gesellschaftsform ist die beste für Unternehmensgründer?

Fachbeitrag. Von GmbH bis AG: Vor- und Nachteile der eigenen Gesellschaftsform

19. Januar 2010 | Joel



Der Unternehmensgründer hat regelmäßig eine Vielzahl von Aufgaben und Problemen, die möglichst schnell erledigt werden wollen. Nicht selten geht dabei die Wahl der richtigen, und das heißt für das wirtschaftliche Vorhaben sinnvollsten, Gesellschaftsform etwas unter oder wird als lästige administrative Formalie wahrgenommen. Dies kann erhebliche Konsequenzen für den Unternehmensgründer haben, wenn das operative Geschäft in der Folgezeit zwar gut anläuft, das rechtliche Gewand durch eine unpassende Gesellschaftsform aber nicht recht passt.

... ..

Rigby, D. K. and Zook, C. (2002) *Open-market Innovation*, *Harvard Business Review*. Available at: <https://hbr.org/2002/10/open-market-innovation> (Accessed: 18 June 2018).

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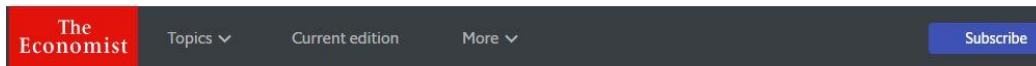
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FROM THE OCTOBER 2002 ISSUE

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When Pitney Bowes learned a year ago that envelopes tainted with anthrax had spread infection and death through the U.S. postal system, executives at the company realized that both their customers and their core business were under attack. Overnight, the world's largest provider of mailing systems was flooded with desperate requests from corporations and postal services seeking a solution—any solution—that could protect people from the deadly spores. Pitney Bowes's core competence was in the area of secure metering systems that protected postal revenue; the \$4.1 billion market leader had nothing in its pipeline to shield clients against a biological threat as unexpected as anthrax.

The Economist (2015) *Blockchain. The next big thing*, *The Economic Journal*. Available at: <https://www.economist.com/news/special-report/21650295-or-it-next-big-thing> (Accessed: 30 May 2018).

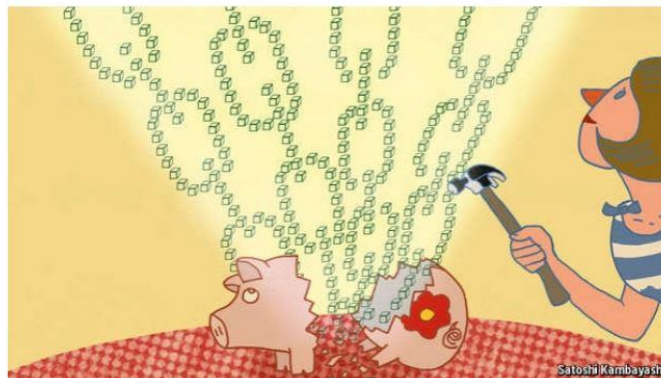


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