

Liability questions concerning patent infringement arisen from consumer-level 3D
printing

Can a CAD file constitute a patent infringement?

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1. INTRODUCTION

The third industrial revolution is now standing on our door steps and knocking on our doors louder and louder. A steam engine could be drawn to symbolize the first industrial revolution. For the second industrial revolution, we could lay down the assembly lines and heavy manufacturing like steel, electricity and automobiles. Looking back in time, these revolutions have been the greatest developments of our time. As for the third industrial revolution, picture; green power technologies, internet and 3D printing technologies.¹ Many copyright and trademark related industries have already had to face the problem of digitalization.² Until now, the patent system has safely stayed in its comfort zone not needing to think about the developing world too much further. However, now that the digitalization is disrupting the world of tangible items, we need to prepare ourselves for the upcoming. It is finally time for the patent system to develop into the level of technology and digitalization of today.

At the beginning of Chapter 1, I will frame my area of study to give a conception of what this study includes and what it does not. I will give a simple introduction to what 3D technology is, how it works and what might be the possible outcome of it. The second chapter will handle the basics of patent law in Finland and the U.S. This is an important chapter as it combines the primary subject of this study to the very basics of patent law and thus makes it easier to understand how the subject moves within the patent legislation. It would be very hard to only try to concentrate on the patent infringements without the basic knowledge of patentability. Since there will be comparisons to the U.S. legislation, it is important to examine these facts also from the U.S. patent law's point of view. In Chapter 3, I will be moving on to the patent infringements. The chapter will get into the scope of patent protection, how the scope is interpreted, and what it consists of. The fourth chapter focuses on different types of infringements in the light of 3D printing technology and more specifically computer-aided design (CAD) files. I will be examining the applicability of Patents Act in the light of CAD files. Also, some relevant case law will be represented in this chapter. This is probably the most significant chapter as it focuses on the exact issues of the whole study. Chapter 5 includes some suggestions

¹ Xin, Liu; Xiang, Yu – Potential Challenges of 3D Printing Technology on Patent Enforcement and Considerations for Countermeasures in China, p. 155, *Journal of Intellectual Property Rights* (2015), Volume 20

² Desai, Deven R; Magliocca, Gerard N. – Patents, meet Napster: 3D Printing and the Digitalization of Things p. 1

on how to prepare ourselves against the risks that might be brought along with the 3D printing technology. These suggestions will concentrate on things that are available for the patentees trying to prevent the infringements from happening before the need for legal remedies. In Chapter 6, I will give my concluding words and ideas of these issues that are brought into discussion here.

1.1 Three-dimensional printing

It has been predicted that by 2018 intellectual property theft due to 3D printing alone will create losses of 100 billion dollars per year.³ Like any other new invention, *three-dimensional printing* seemed unimaginable only a few decades ago. Still, it might seem very complicated and far-fetched to a layperson, exactly, like the idea of mobile phones once amazed people before they became common everyday gadgets. Three-dimensional printers are still, of course, in use of somewhat a limited group of users that mostly consist of different companies in different industries such as construction, aerospace, architecture, automotive and medical replacements. However, as it has been stated, as the number of users of 3D printers builds up, we are on the edge of the third industrial revolution.

Three-dimensional printing or *additive manufacturing*, commonly known as *3D printing* is used to print three-dimensional objects. Initially, it was used for rapid prototyping.⁴ Now, you might wonder what you can actually print with it. Well the answer is: only the sky is the limit. Actually, to get the facts straight, even the sky will not be the limit since this method of printing is used to build parts of spaceships. This is not speculation. 3D printing has successfully already been used in a broad range of different sectors from the mentioned aerospace to prosthetics, implants, hearing aids, sports equipment, art, fashion, and as probably the most recent conquest, food.⁵ The ability for manufacturers to create new prototypes of products rapidly and in an inexpensive way is said to revolutionize the modern industry of manufacturing.⁶ There are countless opportunities that this technology gives but also a great number of loopholes that people may fall into

³ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1322, University of California, Davis Law Review 2015, Volume 48

⁴ Mimler, Mare – 3D printing, the Internet and patent law – A History repeating? p. 1, Queen Mary Intellectual Property Research Institute (2013)

⁵ Petrickand, Irene J.; Simpson Timothy W. – 3D Printing Disrupts Manufacturing, p. 3, Research-Technology Management (2013)

⁶ Xin, Liu; Xiang, Yu – Potential Challenges of 3D Printing Technology on Patent Enforcement and Considerations for Countermeasures in China, p. 155, Journal of Intellectual Property Rights (2015), Volume 20

if they are not aware of the existence of all the intellectual rights their printing may have an infringing effect on.

According to the so called bible of 3D printing, Wohlers Report 2016, more than 278,000 desktop 3D printers were globally sold in 2015. The sales of these printers that cost less than 5000 US dollars has been growing rapidly since 2010, when the corresponding number of 3D printers sold was less than one thousand units.⁷ The global market for 3D printing is already worth more than 5 billion dollars. There does not seem to be an end to the growth wherefore more and more of everyday people will have a desktop 3D printer in their homes as time passes. This will lead to more and more people printing whatever, whenever, and for the manufacturing to become uncontrollable and decentralized.

The need for mass manufacturing in the lower-cost areas, bulk transportation around the world, storage spaces and distribution will reduce remarkably along the way as the 3D printing technology takes over the world. The traditional manufacturing is dependent on these factors. The traditional mass manufacturing methods are based on manufacturing huge amounts of identical items. This method drops the per-item costs and passes them along to the end-consumers. The 3D printing technology allows the manufacturers to create personally modifiable items at the same cost per-item as the traditional manufacture methods. This makes the manufacturing a lot more flexible as the orders may be manufactured *ad hoc*. Usually, the traditional manufacturers also have to choose a suitable place for the physical factories where the mass production takes place. The locations are often chosen based on lower safety standards and lower labor expenses to reduce the costs of the manufacturing. This is not an issue with the additive manufacturing.⁸ As the manufacturing moves from the huge manufacturing halls on to the desktops of everyday people, we are certainly facing a fundamental change in production of material goods. Shipping and storing of products are no longer necessary. The effects of 3D printing will be remarkable. The smartest way to try to survive the change is to try to keep up and develop business models that are suitable for the rapidly changing world.

The 3D printing technology will simply benefit all stages of manufacturing. As for the everyday consumer, the technology will enable them to print the essentials they need on

⁷ Wohlers Associates – Wohlers Report 2016

⁸ Hausman, Kalani K; Horne, Richard – 3D Printing for Dummies, p. 19-20, John Wiley & Sons, Inc. (2014)

demand and personalized to meet the exact requirements for their needs – at least in theory, for now. Meanwhile, 3D printing will also give starts-ups a competitive edge against the industry giants by making specialized products. This is also based on the ability to test and make special featured products in a narrower time span compared with the industry giants' time consuming mass production of products. However, also the traditional giants will be able to take advantage of the 3D printing technology. A lot of the work that is now done by human labor can be transferred to 3D printers which will lower the labor costs. This basically means, that the production can be shifted back to the company's country of origin from the countries referred in the paragraph above.⁹

The questions referred in this study will mainly focus on the issues that arise from the consumer-level 3D printing. It is good to keep in mind that there are five main challenges and limitations – among others – to the current consumer-level 3D printing. The first issue the home manufacturers will face is the size the printers can print in. Currently, most of the desktop 3D printers are only able to print in a maximum size of around 25 x 25 x 25 centimeters. This limits the application of the printers to be used only for small-scale objects. Another obstacle is the resolution. The difference of the resolution between the professional printers and desktop printers is significant which basically means that the desktop printer cannot print even close to the same exactitude as the professional printers are able to. Hence, the home printed objects are not as accurate as professionally printed objects. The third issue concerns the material used in the desktop printers. For now, the only valid material to print with is plastic, more closely only a handful of different plastic materials. This is an essential limitation concerning the use of the printers. For example, there have been some concerns regarding the technology as it enables people to print guns. For now, printing a whole working gun that actually shoots bullets is impossible because of the limitations that the materials cause. The fourth issue worth mentioning here is the speed. The desktop 3D printers are slow which is a great challenge for the widespread adoption of 3D printing. At the current speed of a printer, you could basically run into a store to get a readymade product in time of printing the same product. Lastly, even though the accuracy will improve with each generation of desktop printers, it is remarkably lower than the professional 3D printers. This means that very complex objects will not fulfill the level of accuracy wanted and hence, limits the printable object to fairly simple models.¹⁰

⁹ Desai, Deven R; Magliocca, Gerard N. – Patents, meet Napster: 3D Printing and the Digitalization of Things p. 15

¹⁰ Xometry – 3D Printing, Consumer vs Professional, p. 6-7

As the increase of the use of 3D printing technologies will have both economic and environmental advantages, by making manufacturing and prototyping cheaper and decreasing the need of shipping¹¹ since the transfers will happen in a digital form, it will also create concerns regarding intellectual property law and enforcing it.¹²

Simple Description of the Process of 3D printing

3D printers are meant to print three-dimensional objects. The whole process begins with a “blueprint”. First, to be able to print three-dimensional objects, *a digital model* for the wanted object is required. These models can be created in a couple of ways, for example, by using 3D scanners or by using computer aided design (CAD) programs. The CAD programs make it possible for the user to manipulate and modify the design in a way he or she sees fit. These programs translate the three-dimensional design, stored on your computer, into a model with thin layers which is the readable form for a 3D printer.¹³ To actually make a quality CAD file you will need unique coordinates for every part of the object.

As the CAD file is ready for use, it can be easily distributed through internet to any corner of the world.¹⁴ Often these CAD files are available to download for free. For example, Thingiverse.com¹⁵ is the largest website providing and hosting different kinds of CAD files for the users to freely download and manufacture on their desktop 3D printers. The whole process of producing a CAD file from a scratch is not too complicated. It has been said that it is no longer in too distant a future, that your cell phone will be producing CAD files by scanning objects.¹⁶

Second part of the printing process is sending the digital model to a 3D printer as a command. The software inside the 3D printer will now identify the model.¹⁷ The information regarding the printed object is included in the digital model. After the identification process is done, the 3D printer begins to print out the object. The printer works in an additive process, where the object is composed of successive layers of

¹¹ Mimler, Mare – 3D printing, the Internet and patent law – A History repeating? p. 2, Queen Mary Intellectual Property Research Institute (2013)

¹² Bradshaw, Simon; Bowyer, Adrian; Haufe, Patrick – The Intellectual Property Implications of Low-cost 3D Printing, p. 5, University of Bath, SCRIPTed, Volume 7, Issue 1 (2010)

¹³ Hausman, Kalani K; Horne, Richard – 3D Printing for Dummies, p. 23, John Wiley & Sons, Inc. (2014)

¹⁴ Weinberg, Michael – It will be awesome if they don’t screw it up: 3D Printing, Intellectual Property, and the Fight Over the Next Great Disruptive Technology, p. 3, Public Knowledge (2010)

¹⁵ Desai, Deven R; Magliocca, Gerard N. – Patents, meet Napster: 3D Printing and the Digitalization of Things p. 8

¹⁶ Desai, Deven R; Magliocca, Gerard N. – Patents, meet Napster: 3D Printing and the Digitalization of Things p. 9

¹⁷ Xin, Liu; Xiang, Yu – Potential Challenges of 3D Printing Technology on Patent Enforcement and Considerations for Countermeasures in China, p. 155, Journal of Intellectual Property Rights (2015), Volume 20

material.¹⁸ What makes this technology so amazing and valuable, is that it is capable of manufacturing more complicated and intricate shapes than any other primary manufacturing technology.¹⁹ 3D printers use a print head that adds solid or molten material on every layer. After each layer is made, the print head moves up or the base moves down enough for the new layer to be added on top.²⁰ The industrial printers can be inserted with different materials such as plastic, metal, glass or even living cells.²¹ Layer by layer the 3D printer forms an object described on the CAD file. These printed products may vary from shoes to human body parts and real guns²². At the beginning of this year companies like Nike and BMW started testing HP's new "3D printing assembly line" printing sneakers and parts of automobiles.²³ In July, 2016 the world's first 3D printing restaurant Food Ink was established, bringing together, as they say: "Architects, Artists, Chefs, Designers, Engineers, Futurists, Industrials, Inventors and Technologists".

1.2 Research Questions and Exclusions

In this study, I am going to focus on the issues of possible patent infringements given to arise by consumer-level desktop 3D printing. Even though, 3D printing will, for certain, arise difficult questions among all traditional business models closely in connection with the tangibility of items and all intellectual rights, in this study I will concentrate on examining questions brought up, in the light of patents. These issues have not yet reached the courts or even the knowledge of the everyday people. This is exactly the reason why it is good to set these issues on the table for people to see and understand what is impending in the near future. It may still be early to understand the actual big picture of how much this new technology can affect us and our patent system, but the sooner the preparations begin the less damages will take place when this technology can be found on everybody's desktop.

¹⁸White & Case LLP – 3D Printing – implications on Intellectual Property Rights ("IP Rights"), (2014)

¹⁹ Bradshaw, Simon; Bowyer, Adrian; Haufe, Patrick – The Intellectual Property Implications of Low-cost 3D Printing, p. 8, University of Bath, SCRIPTed, Volume 7, Issue 1 (2010)

²⁰ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1329, University of California, Davis Law Review 2015, Volume 48

²¹ Jewell, Catherine – 3-D Printing and the Future of Stuff, Wipo Magazine (2013)

²² Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1330, University of California, Davis Law Review 2015, Volume 48

²³ Swartz, Jon – HP's new 3-D system to print Nikes, BMW parts, USA Today (May 19, 2016) (<http://www.usatoday.com/story/tech/news/2016/05/17/h-ps-new-3-d-system-print-nikes-bmw-parts/84247506/>)

Since, the United States of America is the market leader²⁴ in the scene of 3D printing, a lot of my sources are written in the light of U.S. legislation. The core purposes within the Finnish and the U.S. legislations concerning patent infringements are comparable. I am going to narrow down the area of my study to cover the Finnish legislation as a base for this study. Since, the case law is very scarce and we can say that the lack of its existence is glaring, as support, I am going to bring ideas and interpretations of terms from the case law from the other Nordic countries. Because of the broad similarities between the Nordic Patent laws the comparisons between the Nordic countries regarding patent legislation is easy. It is a well-established manner of the courts, to look into other Nordic courts' decision and look for directions and guidelines by their case law for the support of Finnish case law – especially in cases where we have no earlier cases. Also, of course, European Union legislation will be automatically taken into account due to the fact that Finland is a Member State of the Union. Some principles from Germany, which has often been the country that Finland has followed after, regarding legislation and interpretation of law, will be brought up in the text.

I am going to study the problems 3D printing might bring to discussion regarding patent protection – mainly the possible infringements. Even more precisely, I will be concentrating on the infringements that will arise from the printing executed by desktop 3D printers at consumer level. I will examine questions like: Who can be held liable for patent infringement if such infringement appears due to 3D printing? Can 3D printing even infringe a patent? Is the infringer the manufacturer of the 3D printer or the end user of the printer? Or maybe, could the liability fall on to the shoulders of the CAD file owner, or to the internet service provider who hosts a file-sharing website to enable users to download files from the site? Answering these questions require a broad understanding of basic patent law, for example what is patentable and what is the scope of patent protection.

At the time of writing, the possibilities for the everyday consumers using desktop 3D printers are still somewhat limited due to various reasons, as established above. However, it is good to begin the discussion of these issues before the development of desktop 3D printers reach the point, where it is actually possible to print anything with them without remarkable effort. I will discuss these issues which have not been

²⁴ Xin, Liu; Xiang, Yu – Potential Challenges of 3D Printing Technology on Patent Enforcement and Considerations for Countermeasures in China, p. 156, Journal of Intellectual Property Rights (2015), Volume 20:

"United States ranks first in 3D printing patent applications for more than 10 years and its amount of applications have stayed above 150 each year since 2003."

addressed in the Finnish legal literature before and hopefully make some valid points that will be taken into account in the further discussions related to the relation between the patents system and 3D printing technologies in Finland. We can already see the direction of the development and it is time to start taking these matters seriously. We should not let the digitalization of patented items shake down the whole system of patents. If we are prepared for these issues that will at some point drastically start affecting the patent system, we can reduce the risks concerning the illicit use of the patents. The patents system does not need to follow the errors that were made when digitalization shook the music industry.

1.3 On the Method of This Study

A method of a legal study is considered as an essential basic feature of science.²⁵ My study will mostly be based on the method of legal dogmatic. The method of legal dogmatic studies the legal norms and the ideas behind them. Legal dogmatic is based on already existing legal norms. The basic research problem within the legal dogmatic is trying to examine these existing norms and legislation applying them with the case at hand.²⁶ It can be said that the most important part of legal dogmatic is the interpretation of the norms. As the written norms give information about the content of the norm, the purpose of interpretation of these norms is to pursue to specify and clarify the real aim and meaning of them. As Hirvonen puts it, the legal dogmatic is trapped within the wording of the legislation.²⁷ The other important function that the legal dogmatic aims at is to systemize the legislation in order for us to find the relevant bits and pieces that are applicable to what we are examining. Through the systematization, legal dogmatic creates terms for the legislation that are used as tools for interpretation.²⁸

Defining terms that have either more than one meaning or are very open to interpretation is an important part of legal dogmatic. This method is built on text analyzes. Legal dogmatic focuses on the wording of the legislation. It aims to define these terms giving them meaning inside the plain term.²⁹ A big question of interpretation in my study is the question of how can *means related to essential elements of the patented invention* be

²⁵ Kolehmainen, Antti – Tutkimusongelma ja metodi lainopillisessa työssä, p. 6 Edilex, vol. 2015/29 Edita Publishing (2015)

²⁶ Husa, Jaakko; Mutanen, Anu; Pohjolainen Teuvo – Kirjoitetaan Juridiikkaa p. 20-21, Talentum (2008)

²⁷ Hirvonen, Ari – Mitkä metodit? Opas oikeustieteen metodologiaan, p. 36 – 37 (2011)

²⁸ Ibid. 25

²⁹ Husa, Jaakko; Mutanen, Anu; Pohjolainen Teuvo – Kirjoitetaan Juridiikkaa p. 25, Talentum (2008)

defined and is there certain limitation concerning means. There is the traditional way how *means* have been interpreted for decades. However, since the traditional way of interpretation has not taken into account the technological development that has happened over the years, this interpretation is now excluding some potential content to the definition of means. This is where we need legal dogmatic to look deeper into the interpretation of the meaning and clarify the term from a new broader perspective whether the definition of *means* as only tangible items could be changed.

Interpretation within the legal dogmatic can be based on the plain meaning of the term or on the other side, it can be based on the aspects of the rule's purpose, for example justice and reasonability.³⁰ I will try to give an interpretive proposition regarding the application of the current legislation after going through the possible ways of looking at the issues. In the end, the interpretations will focus on direct and indirect infringement and CAD files. The theoretical starting point of interpretation is, that the conclusions found in legal problems, are nothing as such. These conclusions and arguments have to be tied to the legislation through reasoning.

The study itself as a whole is based on the method of legal dogmatic as stated above. However, it will have a connection to comparative law as it will look for support and guidelines from another legislations than only the Finnish one. The meaning of comparative law is to examine and compare at least two different legislations. Comparative law is often – as it is here as well – used as a supportive method in legal dogmatic studies. The comparativeness brings depth to the legal dogmatic research by broadening the knowledge of different legislation.³¹ Comparative law pursues to develop legislation by gathering functional and usable rules and regulations together. Comparative law is very often used within the courts and researchers³² to make the reasoning of their founding more stable, as they are not hanging by a tread.

In my study, the comparisons will be made between Finland's and the U.S.'s patent legislations. There will be comparison between the patent acts of these countries and ideas and interpretation of U.S case law will be taken into consideration as for guidelines that may be applicable within the Finnish Patents Act. Also, Nordic countries will be compared with themselves, as case law concerning contributory infringement will be represented. I have knowingly decided to keep the comparative side of this study

³⁰ Ibid. 28

³¹ Husa, Jaakko; Mutanen, Anu; Pohjolainen Teuvo – Kirjoitetaan Juridiikkaa p. 23, Talentum (2008)

³² Ibid. 26

somewhat narrow, since the purpose of this study is to concentrate in Finland and find the suitable solutions between the Finnish Patents Act and patent infringements in light of desktop 3D printing technologies and CAD files.

From the legal dogmatic point of view, the norms and rules are the most important source of law. However, only looking into the norms and rules of the law, the understanding of the law may stay on a very unclear stage since the law is often constructed in a way that leaves room for interpretation. This is why we need to broaden the spectrum of our source of law to case law and the written preparation materials.³³ By reviewing the source of law through different methods of interpretation, for example systematic, historical, comparative, analogical, teleological and/or value-based (moral) interpretation, we get an interpretive proposition representing the substance of the legal rule.³⁴ I will be using most of these methods throughout the study to try to get a hold on the possible interpretation of different issues concerning the matters in this study.

In Finland, sources of law are typically systemized in a hierarchical order based on their binding nature. The best known classification type of source of law, stems from Aarnio's theory of binding natures of different sources. According to Aarnio's theory, there are three levels of different sources of law; strongly binding, weakly binding and permitted sources of law. The strongly binding source of law consists of written law and the established customs of the state. These rules of law must be observed in every case they apply to. If the source of law is not applied, the authority applying the law will be sanctioned for misconduct. A decision made without observing the applicable laws is unlawful. The next category of the weakly binding source of law, means rules that can be deviated from, unlike the strongly binding. Usually, they consist of case law and preparatory works of written law that often state the intent of the legislator. Even though, deviation from this source of law is not prohibited it is likely that, if the court does not take these into consideration, the decision may change in a higher instance later on. Lastly, the permitted sources of law include different arguments, opinions, morals, legal principles and doctrinal study of the law. The permitted source of law is brought up to support the arguments based on the above mentioned sources of laws. Deviation does not cause any consequences here.³⁵

³³ Husa, Jaakko; Mutanen, Anu; Pohjolainen Teuvo – Kirjoitetaan Juridiikkaa p. 33, Talentum (2008)

³⁴ Hirvonen, Ari – Mitkä metodit? Opas oikeustieteen metodologiaan, p. 38 – 40

³⁵ Aarnio, Aulis - Laintulkinnan teoria: Yleisen oikeustieteen oppikirja, p. 220 – 221, Tammi (1989)

An important notice is that since, Finland has joined EU, the hierarchy system has developed in such a way that European Union legislation has supremacy over any domestic legislation of all Member States.³⁶ This means that if there is a conflict between the EU and domestic laws, the EU law will be applied. Another important factor is that the decisions of the EU courts are strongly binding in all Member States, whereas in Finland our own court decisions are only weakly binding as stated above.

3D printing is still a very new phenomena and written law has no clear answers to the issues that arise with 3D printing. It can be stated that Finland is lacking a stable case law concerning patent infringements. It will take time and courage for the patentees to bring a 3D printing related infringement case into the courts. To this day and further, interpreting of issues brought up in this study will remain on a grey and unsettled area of legislation. This is of course a result of fast development of this kind of technology. It is also a well-established fact that the law always follows behind the development, on all aspects of life. Our Patents Act was written in 1967 when 3D printing did not even exist yet. Of course, it has been amended many times throughout the years, latest amendment having entered into force in January 2016. Still, 3D printing is something that does not exactly fit the setting, i.e., Patent Act is not directly applicable to patent infringements arisen from the events of 3D printing.

³⁶ More information about the supremacy of EU laws among Member States, see Craig, Paul; De Burca, Grainne *EU Law: Text, Cases and Materials* (6th ed.), Chapter 9, Oxford: Oxford University Press (2015)

2. PATENT LAW

First of all, to get an idea of what the patent infringements, addressed later on, are based on, it is good to go over the basics of patentability within the Patents Act. It is important to understand what can be patented before we can move on to the patent infringements. Also, the meaning behind the whole patent system is worth knowing about, since often in unclear situations the purpose of the law can be a deciding factor. As the subject of the study is new and, at the time of writing, not addressed too many times before, it is important for the reader to develop a consistent idea of the whole process, no matter regardless if the reader of this study is a patentee or a user or maker of CAD files.

2.1 Finnish Patents Act

The Finnish Patents Act (550/1967) is formed solid on the basis of the European Community and European Patent Office's (EPO) Convention for the European Patent for the Common Market (CPC) even though mutual understanding of the content of this convention was never reached, and the convention did not actually come into force.³⁷ A year before EPO was put up to work, European Patent Convention (EPC) was established, making it possible for patentees to apply for a patent in every contracting member state with one patent application. This Agreement was a great step towards more harmonized patent system within Europe.

Since Finland is a Member State of the European Union, it is also a contracting part of the agreement on Trade-Related Aspects of Intellectual Property Rights, commonly known as the TRIPS Agreement. TRIPS agreement sets down the minimum standards for different aspects of intellectual property rights. The Agreement is implemented by all World Trade Organization members, who all together amount to 162 contracting parties.³⁸ One of the contracting parties of this Agreement is the United States of America, which is a harmonizing factor between the Finnish Patents Act and the US Patent Act.

It is also worth mentioning that there is a large ongoing reform concerning European Union wide patent package which includes the launching of a new unified Court for

³⁷ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttioikeus p. 32, Talentum 2014

³⁸ Contracting parties of TRIPS agreement
(http://www.wipo.int/wipolex/en/other_treaties/parties.jsp?treaty_id=231&group_id=22)

patent related matters with exclusive competence in respect of European patents and European patents with unitary effect within the Member States and a launch of a unitary patent that will be applicable in all 26 Member States.³⁹ Finland has ratified the Unified Patent Court (UPC) Agreement (16351/12) in connection with Unitary Patent (UP) system (Regulations 1257/2012 concerning the unitary patent protection and 1260/2012 concerning the translation arrangements). These are whole new actors on the field of patents and are likely to harmonize the patent system in Europe compared with the current situation.

Meaning of the system

A patent is one of the forms of intellectual property rights. According to Chapter 1, Section 1, subsection 1 of the Patents Act:

Anyone who has made an invention on any field of technology which is susceptible of industrial application, or his successor in title, shall be entitled, on application, to a patent and thereby to the exclusive right to exploit the invention commercially, in accordance with this Act.

As stated in Section 1, the patent gives its holder an exclusive right to exploit the invention for a fixed period of twenty years.⁴⁰ This exclusive right is defined in a negative sense, meaning that the holder of the patent has the right to prohibit others from using the invention commercially without the patent holder's consent.⁴¹ The main purpose behind the patent system is to promote the industrial and technological development.⁴² When the holder of a patent has an exclusivity over the patent, it results in incentive to invent. Moreover, as looking at the world and its emphasis on commercialism, we can easily say that patents are also resulting in incentive in commercializing.⁴³

As the incentive to invent and to commercialize maybe the main ideas behind the closed curtains of patent's ideology, another important function of the system is to disclose the invention to others.⁴⁴ The opposite of what people may think, is that patents are not kept

³⁹ For further information on UPC and UP, see <https://www.epo.org/law-practice/unitary.html>

⁴⁰ Patents Act Chapter 4, Section 40, subsection 1: "A granted patent may be maintained for 20 years from the date on which the application was filed."

⁴¹ Norrgård, Markus – Patent in loukkaus, p. 41, Talentum (2008)

⁴² Norrgård, Markus – Patent in loukkaus, p. 39, Talentum (2008)

⁴³ Ibid. 34

⁴⁴ Ibid. 34

in secret but as you apply for the patent, one needs to disclose everything about the patent in the patent claims that one wants to receive the protection for. In other words, the patent system should encourage other people designing around the existing patents.⁴⁵ Holding the patent is very important for the holder itself, since he can focus on inventing new things or try to develop the patented invention he already has without the fear of someone stealing the idea. Also, having the patent may bring its holder significant economic value. No one can use the patented product without consent of the holder. This often results in licensing agreements with the patentee and another party who wants to use the product, which again brings money to the table.

Of course, these objectives can be questioned. There will always be people saying that patents increase the competition and others will say that patents restrict the competition and slow down the development. Both opinions are probably right – at least partly.⁴⁶ There are Open Source and Open Innovation movements (“the Maker Movement”) that offer so-called free licenses.⁴⁷ These licenses give everyone a platform that they can use free of charge⁴⁸. As an example, the whole scene of 3D printer developers started working on an open-source platform, RepRap⁴⁹ being the mother and father of what I would call the modern desktop 3D printers. The idea was to keep the source open so that everyone could use it, develop it and to make it better together. RepRap was the first affordable desktop 3D printer for everyday people and hobbyists. From the beginning of the RepRap project, the platform has served as a starting point to many of today’s well-known desktop 3D printers, for example MakerBot. MakerBot also started as a pro-open-source company but as the business and greed for money started to grow they took a U-turn in their ideology, patented their technology, and got the hatred from the open-source 3D printing community thrown at their faces.⁵⁰

Patentability

The characteristics for patentable inventions are laid down in the Patents Act, Section 1, as shown above⁵¹, and Section 2, Subsection 1:

⁴⁵ Holbrook, Timothy – How 3D printing threatens our patent system, *The Conversation* (Article, Jan 11, 2016)

⁴⁶ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 850, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

⁴⁷ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttioikeus p. 20, *Talentum* 2014

⁴⁸ Compare to patent licensing.

⁴⁹ <http://reprap.org/>

⁵⁰ *Print the Legend* (documentary, 2014)

⁵¹ Section 1 of the Patents Act

Patents may only be granted for inventions which are new in relation to what was known before the filing date of the patent application, and which also involve an inventive step with respect thereto.

From these Sections, we can separate three primary qualifications that have to be met for the invention to be patentable. The first Section lays down that the invention must be *a technical invention that can be exploited in industrial use*. For the invention to actually be *susceptible of industrial application* the invention has to be technical in nature, have technical power and to be replicable.⁵² It also has to have a problem-solution-approach.⁵³ The addition of *any field of technology* roots from TRIPS (article 27 (1)) and the CPC (52(1)) and was only added into the Finnish Patents Act in 2005. When discussing about digitalization and its rapid development and expansion, this addition might help – or at least broaden – the interpretation of applying the Patents Act within new technologies.

The first Section of the Patents Act also includes a list of things that cannot be regarded as inventions by themselves. There are many exceptions regarding the patentability of inventions but I will only concentrate on the ones that are important considering the scope of my study. In the third paragraph of the Subsection two; *schemes, rules and methods for performing mental acts, playing videogames or doing business, and programs for computers*⁵⁴ are defined as such exemptions. In this study, the matter at hand will later on be touched when viewing the interpretation of patent infringements. Later on, I will discuss if a file created with a computer program could be protected by a patent.⁵⁵

Pursuant to Section 2, Subsection 1 of the Patents Act the invention has to be *new* and it has to *substantially differ from earlier inventions*.⁵⁶ More specifically, the invention has to be new on the day the application is left at the registration authority, which in Finland is the Finnish Patent and Registration Office.⁵⁷ For the invention to be seen as new, it has to be *state of the art* and during the process of settling the question of the newness, it has to be compared with similar technical solutions. If all of the special features of the invention do not match with the invention it is compared with, or one or more of these

⁵² Haarman, Pirkko-Liisa; Mansala, Marja-Leena – *Immateriaalioikeuden perusteet* p. 66, Talentum 2012

⁵³ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – *Patenttioikeus* p. 79, Talentum 2014

⁵⁴ Chapter 1, Section 1, Subsection 2, paragraph 3 of the Patents Act

⁵⁵ See Chapter 4.3, below *Means in the light of 3D printing*

⁵⁶ *Ibid.* 44

⁵⁷ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – *Patenttioikeus* p. 68, Talentum 2014

features are missing, the invention is new. In other words, if there is at least one remarkably different feature in this invention at hand, it fulfils the requirements to be interpreted as a new invention. The interpretation and the comparison are performed from a perspective of what we call *a person skilled in the art*.⁵⁸ The perspective of a skilled person gives knowledge about the stage of generally known technology and hence, makes it easier to understand what can be seen as a new invention within the art and what cannot.⁵⁹ The inventions must also be inventive. Moreover, pursuant to the European Patent Convention (EPC), for the invention to be inventive it cannot be obvious to a person skilled in the art.⁶⁰

Product and process patents

There are two main types of patents. A patent can be directed to protect an actual product or a patent can protect the process or the method in which a product is made. A product, in respect of patents, is not necessarily only a physical object. A product is a technical solution which is described in the patent claims. This is something to pay attention to because it might be a relevant factor when observing if a patented product is being offered as an act of infringement.⁶¹ The exclusivity of a patented process covers the use of the process and offering to use the patented process, in case the user knows or if it is evident that using or offering to use the process, is prohibited without consent of the patent holder.⁶² In this study, the focus will mostly stay on the product patents since 3D printing produces items.

2.2 35 U.S.C a.k.a. Patent Act

As mentioned above, the United States of America is also a member of the TRIPS agreement. This agreement is basically the only harmonizing factor between the patent legislations between Finland and the United States. However, at least in course of patentability and patent infringements we will find a lot of similarities when reviewing the requirements. The U.S. patent legislation will be referred to when looking into the

⁵⁸ Ibid. 49

⁵⁹ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttioikeus p. 69, Talentum 2014

⁶⁰ Article 56 of the EPC: *An invention shall be considered as involving an inventive step if, having regard to the state of the art, it is not obvious to a person skilled in the art. If the state of the art also includes documents within the meaning of Article 54, paragraph 3, these documents shall not be considered in deciding whether there has been an inventive step.*

⁶¹ Norrgård, Markus – Patentin loukkaus p. 61, Talentum (2008)

⁶² Norrgård, Markus – Patentin loukkaus p. 46, Talentum (2008)

case law from the States. Also, it is good to know the very basics of the U.S. patent legislation to understand the differences compared with the Finnish legislation. The ideas from the interpretation and reasoning will be used to form a consensus of the relation between the whole patent system and 3D printing and CAD files.

Patentability

The qualifications of patentable inventions are laid down in the 35 United States Code (U.S.C)⁶³, Section 10:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

As in the Finnish Patents Act, there are similar qualifications in the U.S Patent Act required from an invention for it to be patentable. Even though, the wording of the requirements is different comparing the Finnish and the U.S. legislations, the core purpose of patentability of inventions seems to be similar in both. This also makes it possible to use examples based on the U.S. legislation as ideas and support for the interpretation of the Finnish Patents Act.

The Patent Act sets down four primary requirements for patentability. In the first section, we can find the requirement for patentable *subject matter*. This means the types of inventions listed which can be considered for the patent protection; *process, machine, manufacture, or composition of matter or an improvement thereof*. These types are very generally defined and can be interpreted broadly. The Supreme Court of the United States has stated the patentable matter to “include anything under the sun that is made by man.”⁶⁴ However, the Court also included in the statement that not every discovery is patentable. Examples of not patentable things according to the Supreme Court are the laws of nature, physical phenomena, and abstract ideas. A rough line can be drawn between the products of nature and human-made inventions.⁶⁵ Comparing with the Finnish legislation, there are no regulations on the same kind of subject matter. However, similar kind of requirement is mentioned in Section 14, Subsection 3 of the Patents Decree (669/1980), where the patent types are divided into four categories; *product*,

⁶³ Also known as the Patent Act

⁶⁴ *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

⁶⁵ <https://www.law.cornell.edu/wex/patent>

apparatus, process, and use. This list of types is not exhaustive since the Decree only states that the invention shall, *where possible*, relate to these categories above.

The second requirement for the patentability is the *utility* of the invention. This requirement is also found in the Finnish Patents Act although only indirectly expressed. In other words, as it is written in the Section the invention has to be useful. The Patent and Trademark Office (PTO) has established guidelines for examining the utility requirement concerning patents. According to these guidelines, the patent has a well-established utility when “(i) a person of ordinary skill in the art would immediately appreciate why the invention is useful based on the characteristics of the invention (e.g., properties or applications of a product or process), and (ii) the utility is specific, substantial, and credible.”⁶⁶ Furthermore, the terms used in the second part are defined more specifically in the Utility Guidelines Training Materials.⁶⁷

Novelty, which is described in the 35 U.S.C. § 102, consists of two requirements; novelty and statutory bars to patentability. As of one rule this § 102 can be seen as a corresponding requirement as what the requirement of new is in the Finnish Patents Act. In other words, according to Section 102, the invention cannot be known, patented or described in a publication or used in the United States or for that matter, in any other country, before the applicant applies for the patent for his invention.⁶⁸ The second part of the Section lays down statutory bars, which differs from the Finnish Patents Act, as the inventor cannot delay the seeking for the patent more than a year. If the statutory bar of one year surpasses, the inventor loses his right to patent.⁶⁹ This statutory bar is also known as the grace period which we do not have in Finland.

Last but not least, is the requirement of *nonobviousness*. The invention cannot be obvious to a person having ordinary skill in the art⁷⁰ as laid down in the 35 U.S.C § 103. This same requirement is also laid down in the Finnish Patents Act. In 2007, the Supreme Court addressed the nonobviousness in *KSR International Co. v. Teleflex, Inc.*, holding that “a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.”. Long before this ruling, in 1966, the Supreme Court had held that the differences between the prior art and the claims at

⁶⁶ Guidelines for Examination of Applications for Compliance with the Utility Requirement [R-11.2013] – Section 2, paragraph A

⁶⁷ Utility Guidelines Training Materials p. 5 – 7 (<http://www.uspto.gov/sites/default/files/web/menu/utility.pdf>)

⁶⁸ <https://www.law.cornell.edu/wex/patent>

⁶⁹ Ibid. 61

⁷⁰ Ibid. 61

issue could be resolved comparing the factual inquiries with the scope and content of the prior art.⁷¹

3. PATENT INFRINGEMENT

In this chapter, we will get into examining the scope of the patent protection and what it consists of. This chapter will lay down the source of law that is essential for the whole study. In other words, the exact applicable Sections of the Patents Act will be explored and explained. Understanding the scope of the protection here is very important, since the infringements are tightly attached to the patent claims that are the base for the scope, as explained below. As the scope of protection is clear we will move on to exploring the actual patent infringements. Direct and indirect i.e. contributory infringements will be explained below. The terms of the infringement rules will be separated from each other to make it easier to understand the purpose of the rules, piece by piece.

3.1 Scope of patent protection

There are four primary acts that constitute an infringement of a patent in Finland. These acts are making, offering, putting on the market and using the patented invention. Secondary, the exclusivity of the patent also covers importing and possessing of such protected product as shown below⁷². Secondary infringement acts can only be at hand when connected to a primary act of infringement. An exhaustive list of infringing acts is written down in Section 3, Subsection 1, of the Patents Act;

The exclusive right conferred by a patent shall imply, with the exceptions stated below, that no one may exploit an invention, without the proprietor's consent, by:

(1) making, offering, putting on the market or using a product protected by the patent, or importing or possessing such product for these purposes;

⁷¹ See *Graham v. John Deere Co.*, 383 U.S. 1 (1966).

⁷² Norrgård, Marcus – Patentin loukkaus, p. 45, Talentum 2009

(2) using a process protected by the patent, or offering such process for use in this country if he knows or if it is evident from the circumstances that the use of the process is prohibited without the consent of the proprietor of the patent;

(3) offering, putting on the market or using a product obtained by a process protected by the patent or importing or possessing such product for these purposes.

The rule also includes restrictions of the exclusivity of the right. For us here, the most important one that has to be taken into account is that the exclusive right only applies to commercial use. The patent holder's right to prohibit others from using the patent does not reach private use of the patented invention.⁷³ This Section sets down the frames for the extent of the exclusive right. The other important Section in the Patents Act, concerning the infringements, is Section 39 of the Act, setting down rule of the scope of the protection⁷⁴:

*The scope of protection conferred by a patent shall be determined by the claims.
The description may serve as guidance for interpreting the claims.*

In other words, the applicant himself can affect the scope of the protection, since he is the one writing down the claims as a part of the patent application process. If the patent is complicated or otherwise difficult to understand, the applicant may use descriptions and pictures to further describe the functions of the invention. The requirements of patentability, as explained above, are the only limiting factors for what can be listed in the patent claims. In other words, the content of the claims is not defined. This will arise the question whether a CAD file could actually be listed in the patent claims as an essential element of the patent.

The scope of protection is not only limited to the exact wording of the claims, but is also open to interpretation.⁷⁵ The main rule is that non-essential differences between the wording of the patent claims and the allegedly infringing item, are not enough to invalidate the infringement claim. Non-essentialism as such is too abstract and general to use, hence the functionality and the effect of the patented invention are also to be taken into account.⁷⁶ The interpretation that detaches from the wording of the claims is

⁷³ Section 3, Subsection 3, Paragraph 1 of the Patents Act

⁷⁴ See also article 69 of the European Patent Convention (EPC)

⁷⁵ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttuoikeus p. 223, Talentum 2014

⁷⁶ Norrgård, Marcus – Patentin loukkaus p. 216, Talentum (2009)

also known as the *doctrine of equivalence*. The claims are used as tools for the interpretation of equivalency.⁷⁷ This doctrine is created to catch the ones that try to avoid infringing a patent by making only minor changes to the patented technology. In other words, this doctrine can be utilized to enable claims to go beyond the literal terms in the patent claims.⁷⁸ This doctrine will be discussed and applied in the frames of 3D printing, later on, in Section 4.2 under *Direct infringement due to the doctrine of equivalency*. For clarifying reasons, this doctrine was also added into the article 69 of the EPC in 2000. It was stated, that amendment to Section 39 of the Patents Act was not needed due to the open wording of the Section.⁷⁹ Thus, non-literal interpretation i.e. equivalency is also enabled under to the Patents Act.

The interpretation of an infringement starts with considering these aspects mentioned above, firstly through comparing the allegedly infringing objects with the wording of the patent claims. Could the alleged act of infringement correspond to these protected types of use? Does the protection reach as far as the alleged act?⁸⁰ Also, it is important to remember that patent protection is not international but complies with the principle of territorialism.⁸¹ The geographical scope of the protection of the patent is always tied to a country in which the protection of the patent has been sought, approved, and registered. A Finnish patent is only valid in Finland, and so on. This is also a very important and complicated factor, when examining the patent protection in the context of 3D printing, and how the CAD files can travel easily over the geographical state borders through the internet.

In a question of infringement, the alleged infringing product is objectively compared with the patented product and the claims registered with the patent application. A clear, objective similarity is enough for the product to be found infringing.⁸² However, a small difference can be essential enough to invalidate the claim of infringement. The product that is under the allegations of being infringing has to match all the special features of the written claims or features equivalent⁸³ to what is described in the claims.

⁷⁷ Ibid. 68s

⁷⁸ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 54-55, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

⁷⁹ HE 92/2005

⁸⁰ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttioikeus p. 221, Talentum 2014

⁸¹ Norrgård, Marcus – Patentiloukkaus p. 47, Talentum (2009)

⁸² Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttioikeus p. 225, Talentum 2014

⁸³ Protocol on the Interpretation of Article 69 of EPC – Article 2: Article 2 (Equivalents): (1) For the purpose of determining the extent of protection conferred by a European patent, due account shall be taken of means which at the time of the alleged infringement are equivalent to the means specified in the claims. (2) A means shall

3.2 Direct infringement

Pursuant to Section 3, Subsection 1 of the Patents Act, a person, who makes, offers, puts on market or uses a patented product or imports or holds in his possession such product, meaning to offer, put on the market or use, is guilty of direct infringement of a patent. As there are different types of patents, using a patented process is also considered as a direct infringement of a process patent. Due to indirect protection of the patented process, also a product, made by using such process, is covered by the patent.⁸⁴ This type of protection further enforces the exclusive right to the invention. However, indirect protection is not to be confused with indirect i.e. contributory infringement. The indirect protection guards against situations where the usage of the process could take place outside of Finland and then products made using the patented process would be brought back into the country.⁸⁵ This kind of indirect protection is already set down in the TRIPS agreement, guaranteeing the protection at least for the products obtained directly using the patented method.⁸⁶

A direct patent infringement does not require the patent holder to suffer any damage, neither the intent of the infringer nor for the infringer to gain any profit from the use of the patent. Knowledge of the patent is not required, either. This, however, differs depending on what kind of patent is at hand. In case of products, including products made using a patented process, the knowledge requirement does not apply. Contrary to this, knowledge of the patent is required when considering an infringement of a process patent.⁸⁷ Furthermore, knowledge is required when offering the patented product for use, to a third person.⁸⁸ It is important to understand that damages are a totally separate question when considering a patent infringement case. Damages require negligence and are governed under regulations of the Damages Act (412/1974).

The exemption of commercial use in Section 3, Subsection 3, Paragraph 3 of the Patents Act is the most important one concerning this study. This rule allows private use of the patented invention in situations it cannot in any way be interpreted as commercial use.

generally be considered as being equivalent if it is obvious to a person skilled in the art that using such means achieves substantially the same result as that achieved through the means specified in the claim.

⁸⁴ Haarman, Pirkko-Liisa; Mansala, Marja-Leena – Immateriaalioikeuden perusteet p. 67, Talentum 2012

⁸⁵ Norrgård, Marcus – Patentien loukkaus p. 75, Talentum (2009)

⁸⁶ Article 28.1 of the TRIPS Agreement

⁸⁷ Section 3, Subsection 1, Paragraph 2 of the Patents Act

⁸⁸ Norrgård, Marcus – Patentien loukkaus p. 74, Talentum (2009)

When the patented product is used in commercial purposes⁸⁹, an infringement has happened. The term commercial use should be interpreted broadly containing all forms of commercial exploitation.⁹⁰ Being commercial does not require the using to be economically profitable. For example, according to the Finnish Supreme Court⁹¹, only keeping oil recovery equipment in alert was considered commercial use. This gives a conception of the broadness of the term's definition. It has also been said that commercial use requires a stage of continuous activity.⁹²

Making and using the product as acts of infringement seem fairly self-explanatory. No one can simply make or use a patented product without a consent of the patent holder. More complex interpretation is required when a case of offering a patented product, is in question. It is not completely settled, what *offering* really means. However, basically all acts that target to promote the product or process as available for trade, rent, etc. to a third person are to be included in the term of offering.⁹³ Another prohibited act is *putting on the market*. According to the government bill⁹⁴, putting on the market includes selling, renting and loaning. It is also stated in the bill that already a stage of taking any steps towards these acts have to be considered putting on the market. This statement, for sure, adds some confusion and pressure on the interpretation of putting on the market. According to Norrgård, putting on the market still requires an actual transfer of the control of the product.⁹⁵ This opinion clearly differs from the wording of the government bill that the whole Patents Act is based on.

As mentioned before, those above listed acts of infringements are primary types of infringements, and can be identified by themselves. Secondary acts of infringements that can only be identified in connection with the primary acts are importation and possession of such products. In other words, these only apply when the aim of the act is to either offer, put on the market or use the product in Finland.⁹⁶

⁸⁹ Section 3, Subsection 3, Paragraph 1 of the Patents Act

⁹⁰ HE 101/1966 p. 10: "säännös käsittää periaatteessa kaikki ajateltavissa olevat ammattimaisen hyväksikäyttämisen muodot".

⁹¹ KKO 2003:127

⁹² Domeij, Bengt – Patenträtt p. 100, Iustus (2007)

⁹³ Norrgård, Marcus – Patentin loukkaus p. 64, Talentum (2009)

⁹⁴ HE 139/1979, s. 9. KM 1977:38, s. 82.

⁹⁵ Norrgård, Marcus – Patentin loukkaus p. 66, Talentum (2009)

⁹⁶ Norrgård, Marcus – Patentin loukkaus p. 44, Talentum (2009)

3.3 Contributory infringement

Contributory infringement was not included in the original version of Section 3 of the Patents Act. The Section was renewed and amended in 1980⁹⁷ in accordance with the article 26 of the CPC. The meaning behind this regulation was to ensure that also a person, who is supplying a third person with the *means related to essential elements* for patented products, would be possible to be held liable of an infringement of the patent – contributory infringement.⁹⁸ Great importance was attached to the fact that the patent holders could step in to stop the infringing act in an earlier stage, before the actual infringement would happen. Meaning that the contributory infringement would be an independent act of infringement. The holder could stop the infringing act on the stage of preparations and before the infringing product would be put on the market.⁹⁹

Contributory infringement is set down in Section 3, Subsection 2 of the Patents Act:

A patent shall also confer on its proprietor the exclusive right to prevent any person not having his consent from supplying or offering to supply any person not entitled to exploit the invention with the means of working the invention in this country in relation to an essential element of the invention where such other person knows, or where it is evident from the circumstances, that the means are suitable and intended for working the invention.

The idea of an indirect i.e. contributory infringement might seem complicated at first. There are several little pieces that all together constitute a complex of indirect infringement. The idea is based on a prohibition of a promotion of a direct infringement by a third party i.e. the supplier. According to Section 3, Subsection 2 of the Patents Act, the person has to supply or offer to supply a third person with *means related to essential elements* of the patented invention, who then directly infringes the patent. The person supplying the infringing means does not himself directly infringe the patent but is making the infringement possible for another person, by supplying this person with the means related to essential elements of the patented invention.¹⁰⁰ The supplied means enable the recipient to *put the invention into effect* in an infringing way. The indirect infringement already happens when the means are supplied or offered to a third

⁹⁷ Ibid. 94

⁹⁸ Norrgård, Marcus – Patent in loukkaus p. 84, Talentum (2008)

⁹⁹ Ibid. 98

¹⁰⁰ Norrgård, Marcus – Patent in loukkaus p. 83, Talentum (2008)

person.¹⁰¹ Indirect infringement does not, however, require for the third person to actually put the invention into effect with the supplied means, which makes indirect infringement an independent act of infringement.

There is an exception of staple commercial products which requires inducement from the supplier. Section 3, Subsection 2 of the Patents Act:

This provision shall not apply where the means are staple commercial products, except where such other person attempts to induce the receiver to commit any of the acts referred to in the first subsection of this section.

When the means are already commonly put on the market i.e. *stable commercial products*, indirect infringement requires *active inducement* by the person, who is supplying these means. This signifies that the person actively tries to make the direct infringement happen by encouraging a third person to buy means to use it in a specific patented invention.¹⁰² The term, *induce*, does not have an established meaning in the Finnish case law. To look for a definition a little bit farther, the 35 U.S.C § 271 (b) sets down a rule of active inducement that constitutes a type of contributory infringement. The term, *induce*, originates from the Anglo-American common law system. Supreme Court of the United States has stated that “*the term induce means to lead on; to influence; to prevail on; to move by persuasion or influence*”. This helps us to understand the basic meaning of the term.

In the U.S., the contributory infringement is divided into two, where the 35 U.S.C. § 271 (c), contributory infringement¹⁰³, represents the most common types of indirect infringement and 35 U.S.C. § 271 (b), active inducement, covers all other forms of indirect infringement. Even though, the inducement, which in other words means the intent to cause the infringement is not required in the contributory infringement, it is presumed.¹⁰⁴ As stated above, in the Finnish system the requirement of inducement only becomes valid when it is a question of a patent that has already been commonly put on the market. Comparing the Section 3, Subsection 2 of the Finnish Patents Act with the 35 U.S.C. § 271 (c) it is fair to say that the contributory infringement rules are similar.

¹⁰¹ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 857, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

¹⁰² Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttioikeus p. 231, Talentum 2014 and Norrgård, Marcus – Patentin loukkaus p. 89, Talentum (2008)

¹⁰³ Ibid. 83

¹⁰⁴ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1345, University of California, Davis Law Review 2015, Volume 48

However, examining the differences between the wordings in the contributory infringement rules in the U.S and Finland, the U.S. Patent Act's wording differs crucially from the Finnish Patents Act. This is a good difference looking from the Finnish point of view of enforcing patent protection. Most of the discussions in the U.S. have been focusing on the fact whether the CAD files could be considered components¹⁰⁵, but it is a question of interpretation of these terms that is lurking around the corner.¹⁰⁶ The contributory infringement in the U.S. Patent Act requires *selling* or *an offer to sell*. The Finnish Patents Act only requires *supplying* or *offering to supply*. The crucial factor here is the difference between *selling* and *supplying*. Selling requires taking payment for the means, where supplying does not. In the U.S., this may raise another obstacle when applying the 35 U.S.C. 271 (c) rule of contributory infringement with CAD files. Already, CAD files are being distributed on file-sharing websites free of charge. If the selling is strictly interpreted as a bargain that requires a fee for the item, the contributory infringement due to this rule in question will not be applicable. As for the wording of the Finnish regulation, there is no requirement of a fee, which makes it one less obstacle to tackle on the way of deciding whether the CAD files could be capable of constituting a contributory infringement.

Means

What are the kind of *means* that can be considered to constitute a contributory infringement when supplied or offered to supply to a third party? Section 3, Subsection 2 of the Patents Act:

A patent shall also confer on its proprietor the exclusive right to prevent any person not having his consent from supplying or offering to supply any person not entitled to exploit the invention with the means of working the invention in this country in relation to an essential element of the invention where such other person knows, or where it is evident from the circumstances, that the means are suitable and intended for working the invention.

The supplier does not need to supply a third person with the essential element of the patented invention, but simply the *means* that relate to such element or elements. It is good to remind ourselves that there are different types of patents – product patents or

¹⁰⁵ *Component* in the U.S. legislation and *means* in the Finnish legislation equate to each other.

¹⁰⁶ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1345-1346, University of California, Davis Law Review 2015, Volume 48

process patents – and the interpretation of means is the same regardless of the patent type.¹⁰⁷ Means do not have a clear definition in the legislation. The legislator has left the defining of the term for the authorities applying the rule. Traditionally, means have been considered as a physical, tangible object. This type of narrow-minded way of thinking is not really suitable for the world that we are living in today. This traditional way of interpreting means applies in both countries, Finland and the U.S. However, to stay on top of the development and to reduce the risks of wide-spread mass infringement this interpretation would require an update. To give at least loose frames and a starting point for the new interpretation of means, the common understanding has been that simple and abstract instructions, per se, could not be qualified as means within the context of indirect infringement.¹⁰⁸ This understanding is also supported by the Norwegian Supreme Court ruling in SINTEF.¹⁰⁹

Connected to the context of 3D printing we will now look into the following. According to Section 1, Subsection 2, Paragraph 3 of the Patents Act, computer programs are not patentable *as such*, but they are indeed patentable as a part of an invention. Referring to the above mentioned traditional way of interpreting, this leads to broadening the interpretation of *means*. When a patent consists of a computer program and a physical object, it would only be logical to consider the computer program as means related to an essential element of the invention.¹¹⁰ Interpreting of *means* is definitely not as simple as it used to be at a time when things were mostly tangible. It is good to note that there is no strict objection towards more allowing interpretation, where also software would be included in the definition of means as a part of a larger whole of an invention.¹¹¹ Later on, I will be discussing whether CAD files could be interpreted as such *means relating to essential elements of patented inventions* and hence constitute an infringement.

Essential Elements

Contributory infringement requires that the supplied means, in relation to elements, are essential for the invention. Already, one element of the invention can qualify as

¹⁰⁷ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 858, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

¹⁰⁸ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 857, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

¹⁰⁹ See Chapter 4.1 Case law

¹¹⁰ Norrgård, Marcus – Patentin loukkaus p. 85, Talentum (2008), Also see the Ibid. 109: In SINTEF the Supreme Court stated that computer program can be interpreted as means and it can constitute a contributory patent infringement.

¹¹¹ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 858, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

infringing when it is truly essential for the invention to work properly. Patent claims step in when interpreting the essentialism of the elements. The patent claims specify the pieces of what the invention consists of and what the scope of the patent protection is.¹¹² The basic starting point here is that all the elements listed in the claims are essential.¹¹³ Looking in the opposite direction, the question remains, if an element, not listed in the patent claims, could constitute an essential element of the patented invention. The question of whether the element is essential, or not, is to be decided on case-by-case bases. Since, there is very little case law concerning these matters the definition of the essential elements stays unclear.¹¹⁴ The European Court seems to be attaching the essential elements very closely with the interpretation of means.¹¹⁵ Yet again, these questions cannot be answered in a general way, but instead, on case-by-case basis.

Independency of the act

Another question is whether indirect infringement is possible as an independent act of infringement.¹¹⁶ As stated above, part of the reasoning of the whole rule was that the patent holder could stop the infringing acts before the infringing product would get to the market and create a widespread and uncontrollable range of direct infringement. It would seem odd, if the indirect infringer could only be held liable, when there is also a direct infringement at hand. It has been stated, as a common understanding that contributory infringement can be committed without a direct infringement. In other words, indirect infringement is an independent act of infringement.¹¹⁷

Bad faith

There are two conditions to be satisfied in the contributory infringement; knowledge of the patent and the intent of use. The opposite, compared with the direct infringement which does not require knowledge of the patent from the infringer, contributory infringement requires acting in bad faith. This means that the person who is indirectly infringing a patent knows that the means, he is supplying or offering to supply, are suitable with the invention, and is intended to be used to put the invention into effect.

¹¹² Section 39 of the Patents Act

¹¹³ Norrgård, Marcus – Patentin loukkaus p. 85, Talentum (2008)

¹¹⁴ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 858, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

¹¹⁵ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 859, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

¹¹⁶ Norrgård, Marcus – Patentin loukkaus p. 86, Talentum (2008)

¹¹⁷ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 857, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

Even, if the infringer does not know but it is evident that the means supplied or offered to be supplied are used in the invention, the circumstances may impose a requirement that the infringer should have known about the patent.¹¹⁸

Suitability signifies that the means actually make it possible to carry out the invention i.e. makes the invention usable.¹¹⁹ When the means do not have any other use except how it is suitable for carrying out the invention, the constructive – circumstantial – knowledge is clear. However, in a situation in which the supplied means have other uses than what it is used for in the invention, the constructive knowledge might be harder to prove.¹²⁰ Basically, this means that if the supplier of means does not know of the suitability with an invention or, the suitability for the invention is not evident from the circumstances i.e. constructive knowledge of the suitability, his or her actions cannot constitute an indirect invention. Given the circumstances the deciding factor might be tied to what the person in the receiving end intends to use the element. This again depends on what can be proven and what cannot.

¹¹⁸ Norrgård, Marcus – Patent in loukkaus p. 88, Talentum (2008)

¹¹⁹ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 860, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

¹²⁰ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 860, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

4. INFRINGEMENT – 3D PRINTING AND COMPUTER-AIDED DESIGN (CAD) FILES

4.1 Case law

Align v. ClearCorrect (United States of America)

The case *Align v. ClearCorrect* is so far, at the time of writing, the only case that has actually clearly concerned 3D printing and the interpretation of CAD files as infringing components or means. Even though, this case was settled in the end and the decision by the International Trade Commission (ITC) was discarded by the United States Court of Appeals for the Federal Circuit due to lack of jurisdiction, there is relevant reasoning to the Commission's decision. This is the beginning of case law in respect of 3D printing and CAD files. The common understanding seems to be shifting towards allowing digital and intangible items as well as tangible items. The direction is good, since the digitalization will at some point change the most common objects – that we are always known to be tangible – intangible.

The case was based on Align Technology, Inc.'s complaint against ClearCorrect Operation, LLC and ClearCorrect Pakistan, Ltd. (collectively ClearCorrect), claiming infringement of seven different patents owned by the Align. Align has several patents concerning the product – aligners for teeth. ClearCorrect made its aligners through a process of scanning a patient's teeth in the U.S. and creating a digital model of the patient's teeth. These files were transferred to ClearCorrect Pakistan in a digital form where the scanned model of the arrangement of the patient's teeth was modified to the wanted final position of the teeth. These modified models of the teeth were then transferred back into the U.S. and ClearCorrect there would print the models into the physical form with using 3D printing technology. Finally, this 3D printed model would be used as a mold for the aligners, as the end product.

Align claimed that the act of transmission of the articles here “digital models, digital data and treatment plans, expressed as digital data sets, which are virtual three-dimensional models of the desired positions of the patients' teeth at various stages of orthodontic treatment” were in violation of its patents. The patent claims were divided in 4 different groups in which the Commission found the claims related to group one and two infringed. These groups included the method of forming dental appliances and those related to methods of producing digital data sets. Also, the Administrative Law

Judge supported the decision of finding the infringement. The Commission found that ClearCorrect U.S. directly infringed the Align’s patents by making patented products and contributory infringement by ClearCorrect Pakistan for importing the data models into the U.S. This is really something to pay attention to. The Commission actually found that importing the CAD files for the aligners into the U.S. was a contributory act of infringement. This would mean that the digital file i.e. the CAD file, was interpreted as an article that constituted a contributory infringement. Logically, this could be paralleled to 35 U.S.C § 127 (c) Patent Act, whereas these articles could be interpreted as components i.e. means. Articles that were imported into the U.S. were CAD files which contributed the direct infringement in the U.S.

The purpose of 19 U.S.C. § 1337 (“Section 337”) – the regulation in question in the case – is to regulate international commerce and focuses on commercial activity related to cross-border movement of goods. The Section 337 reads as follows:

Subject to paragraph (2), the following are unlawful, and when found by the Commission to exist shall be dealt with, in addition to any other provision of law, as provided in this section:

(A) Unfair methods of competition and unfair acts in the importation of articles (other than articles provided for in subparagraphs (B)¹²¹, (C)¹²², (D)¹²³, and (E)) into the United States, or in the sale of such articles by the owner, importer, or consignee, the threat or effect of which is—

The importance here is the interpretation of *articles*; whether the articles can be considered to include digital files that represent a physical item. Since the term, *article*, is not defined in the Act, it is open to interpretation and the Commission had to look further to find the meaning of the term. The Commission found the *articles* to “embrace a generic meaning that it is synonymous with a particular item or thing, such as a unit of merchandise” based on the 1924 edition of Webster’s New International Dictionary of the English Language. Hence, the Commission interpreted the term, *articles*, not to be narrowed down to only material things but to also include digital data. At least this

¹²¹ (B) The importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that

¹²² (C) The importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that infringe a valid and enforceable United States trademark registered under the Trademark Act of 1946 [15 U.S.C. 1051 et seq.].

¹²³ (E) The importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consigner, of an article that constitutes infringement of the exclusive rights in a design protected under chapter 13 of title 17.

definition does not give the impression that articles could not be interpreted more broadly than material things. Within the context of Section 377, articles are connected with importing for sale. The Commission therefore concluded as a supportive measure that since the digital files in the case were imported into the country for the purpose of eventually selling the items made by using the files, they would constitute as “articles of commerce” and therefore include digital files.

Even though, the Chief Judge Prost and the Circuit Court Judge O’Malley appear to disagree systematically on everything the Commission had stated in its decision, the decision by the Court of Appeals was not unanimous. There is one dissenting opinion by Circuit Judge Newman who supports the decision of the Commission. Judge Newman states that the reasoning of the Court for articles being only tangible items conflicts rulings of all hereby relevant Courts and authorities in the U.S. and therefore he respectfully dissented from the decision. Here again, it is noteworthy that, even though, the Court is not interpreting the infringement itself, the decision can be read as it was obvious to consider the CAD files of the aligners as infringing components¹²⁴. Newman says the decision of the Court on rejecting the Commission’s view on including the digital files in the definition of articles fights against the text and purpose of Section 337 of the Tariff Act. The purpose of the regulation is indeed to forbid any infringing imports that result in an unfair competition in the U.S. Taking into account the development of the technologies since 1922 and 1930 Newman also completely agrees with the Commission’s decision on the matter that the regulation in question is not limited to the kinds of technology that existed during those years. He refers to *Fortnightly Corp. v. United Artists Television, Inc.*, where the Supreme Court held that “a statute that was drafted long before the development of the electronic phenomena with which we deal here ... we must read the statutory language ... in the light of drastic technological change.”. This statement has totally been discarded as the majority of the court’s opinion based its reasoning on excluding the intangible digital files from the definition of articles. The whole purpose of Section 377 is shaken down by this decision.

Generally, based on the Commission’s and Judge Newman’s statements and founding, it seems it should be unarguable that digital files should be interpreted as articles as found in the Tariff Act. Through analogy, this interpretation would affect the definition of articles to be more broadly interpreted and to include intangible items. There does not

¹²⁴ 35 U.S.C. § 127 (c)

seem to be any bullet proof reasoning to exclude the digital files from the definition of articles. There are masses of Supreme Court decisions that support the view that digital files should be included in the definition just as computer programs¹²⁵ have been included. Newman also notes that the difficulty of the enforcement – stopping the importation of digital files – cannot be grounds for discarding a remedial statute. Over all, the most important fact here is that a contributory infringement was found due to an import of a CAD file.

Notes

Despite the fact that the whole case somewhat trickled down the drain due to the question of jurisdiction, this case builds up the basis for the possibility to consider CAD files as means, or within the U.S. vocabulary, as components. This case and the Commission's reasoning brings us closer to establishing that CAD files are means without triggering the difficult question whether the files should be seen as computer programs or software or items falling into the scope of copyrights. When the courts will finally establish – which they probably at some point will – whether CAD files can be interpreted as means, deciding on contributory infringement cases will get a lot easier.

Kvassheim v. research foundation Stiftelsen SINTEF¹²⁶ (Norway)

The case SINTEF is also a great decision towards the interpretation of including the digital files in the definition of means, written down in the Patents Act. The Norwegian Patents Act is relatively similar to the Finnish Patents Act. Section 3, Subsection 2 of both Patents Acts define a contributory infringement reflecting each other's wordings. It is very common for the courts in the Nordic Countries to use each other's case law as support to their reasoning. It is also very common to the parties in court to reason their claims based on other Nordic case law, especially when there is no valid case law available, concerning the claim at hand in that country. Accordingly, since there is no case law concerning contributory infringements nor the questions related to allowing interpretation of computer programs as means related to essential elements of inventions, this decision can be used as supportive reasoning in a contributory infringement case where CAD files would be reflected on computer programs.

¹²⁵ Lucent Techs., Inc. v. Gateway, Inc. 580 F.3d 1301, 1321 (Federal Circuit Court 2009) – The court rejected the argument that digital files such as computer software are not a "material or apparatus" subject to infringement as set forth in the 35 U.S.C. § 271(c).

¹²⁶ Rt. 2009 s. 1665

The case itself concerned a situation where a research foundation called SINTEF had created computer software which was used for its customer's fish counters. These fish counters had already been found to infringe an existing patent in an earlier court case concerning a direct infringement. Due to the fact that the company making the fish counters went bankrupt and the patent holder could not collect the damages appointed to him due to direct infringement. The infringed patent protected "A device for the recording of number and size classification of objects, wherein the objects pass between a light source (1) and an objective (2)/CCD-line camera (3) further transmitting data to a signal processing card (4). The signal processing card (4) is connected to a PC-card (5) which executes calculations of the measured data for the determination of the number of objects as well as size classification. When classifying by size, the PC-card (5) also gives signals to an actuator (7) controlling flaps (8) guiding the objects to appropriate channel/chute."

SINTEF supplied the customer with its computer software for the infringing fish counter. The patent holder had first sued the customer who had made the infringing fish counters for direct infringement but failed to collect the awarded damages because of the infringer's bankruptcy. Hence, the patent holder sued SINTEF for contributory infringement.

The Supreme Court of Norway first rejected the argument of the use of the computer software falling into the scope of the research exemption. Further, it took a stand on if the supplying of the computer program fulfills the definition of contributory infringement. The computer program was interpreted as being essential to the invention since it made it possible for the direct infringer to exploit the invention in an infringing way. Through analogy, this also resulted in making the computer program interpreted as a means of the patented invention. The Supreme Court stated that only the supplying of pure information would not result in interpreting the supplied things as means pursuant to the Patents Act. However, by supplying more than pure information; test results, directions on how fish counter would be used, algorithms and such, the supplied things constitute together as means.

The Supreme Court did not take a stand on whether there was an actual contributory infringement here but returned its judgement to the Court of Appeals suggesting that the supplying of the software may fall into the scope of contributory patent infringement pursuant to Section 3, Subsection 2 of the Norwegian Patents Act:

The exclusive right shall also imply that no one but the patent holder may, without his consent, exploit the invention by offering or supplying any person who is not entitled to exploit the invention in this country with the means for carrying out the invention, provided that the means relate to an essential element of the invention and the person supplying or offering the means knows, or it is obvious from the circumstances, that the means are suitable and intended for such exploitation.

The case was handled in the Supreme Court due the patentee's appeal on the Court of Appeals decision stating that SINTEF could not be held liable due to the exemption of experimental use of the invention. Eventually, the case was turned back to the Court of Appeals and it held its original decision on the exemption of experimental use.¹²⁷ However, this is a great decision for the Nordic case law, having the Supreme Court state that software can be interpreted as means and can result in contributory infringement.

Notes

This case is also a remarkable one when discussing the case law that follows the development of the world and especially on the field of technology. As stated many times before, there is very little case law concerning the contributory infringement doctrine. This case roams around those facts that in the end gave us the Supreme Court statement of computer software being able to be considered as means. This statement constitutes an interpretation of mean not only being tangible items. Hence, these digital files may constitute a contributory patent infringement – when other circumstances do not fall into the scope of the exemptions listed in the Patents Act. This has not, of course, been settled yet, since there is no valid case law saying whether digital files, or more specifically CAD files, could be reflected on computer software, but it is a step forward.

Summary of establishments

Recognizing the fact that there are different regulations (the U.S. Patent Act and the Norwegian Patents Act) behind these court rulings on contributory infringements, there are similar aspects that should be taken into consideration when these kind of cases start appearing in the courts more regularly. The contributory infringement rule differs

¹²⁷ Borgarting Court of Appeals, 30.5.2011 (07-192273ASI-BORG/03)

between the Nordics and the U.S. but the main purpose of the rule is somewhat the same in each country.

In *Align*, the International Trade Commission in the U.S. had to interpret the term *articles* in the Tariff Act, but it can be reflected to the *components* in the Patent Act. Since, there was no definition for the term in the act itself or any valid case law concerning the definition of the term, the Commission by thorough reasoning found that there is no valid reason for the definition of the term to exclude digital files. Hence, the Commission established that the CAD files, in question, were indeed, components that resulted in a contributory infringement pursuant to the 35 U.S.C. 127 § (c).

In *SINTEF*, a similar statement was given by the Supreme Court of Norway. In the reasoning the Supreme Court stated that by purely giving information regarding, for example, use of the patented invention, the requirements for contributory infringement cannot be fulfilled. This has been the common consensus also within the Finnish legal literature. However, when more than pure information is offered to the user of the patented invention – here the software – the supplier may become liable due to a contributory infringement pursuant to Section 3, Subsection 2 of the Patents Act. The Supreme Court also clearly stated that computer software is to be included in the definition of means. Now, it is only a question of whether CAD files could be considered being more than pure information or, on the other hand, as software. This gives us something to grab into when looking for the enforcement of the protection of our patents.

These cases also strengthen – to some extent – the view, that maybe the contributory infringement could be the best avenue to pursue the enforcement of the protection of our patents – of course taking into account the different situations. However, the rulings still leave uncertainty relating to the question whether CAD files can even be interpreted as means. The reasoning in *Align* is based on the fact that the only reason intangible item would be excluded from the definition of components is the traditional way of interpreting components; components are tangible items. Whereas in *SINTEF*, it is stated that computer software can be included in the definition of means and hence constitute a contributory infringement. This is a good decision since computer software can be related to intangible items. However, for this decision to directly support the interpretation of CAD files as means we would need stable reasoning concerning how CAD files and computer software can be interpreted as equals.

4.2 Direct Infringement in the context of 3D Printing

Direct infringement by the end user of the 3D printer

At first glance, looking at 3D printing related patent infringements, suing the end user for direct infringement might seem like a good idea. The end user i.e. the person who prints the patented invention using a desktop 3D printer, is clearly *making* the invention. Pursuant to Section 3 of the Patens Act, making constitutes a direct infringement of a patent. If we had the same kind of provision regarding *making* as in the U.S., already the making would constitute an infringement. Instead in Finland, there is an exemption in Section 3, Subsection 3, Paragraph 1 in the Patents Act; private use does not count. The exclusive right of the patent holder does not apply to the use of the invention which is not commercial. This excludes a number of end users outside the scope of protection. Hypothetically thinking, it could be assumed that most of the end users printing patent protected inventions are printing these inventions only for their own use.

However, there will most likely also be a number of users that are making and using these patented inventions in the infringing way – for commercial purposes¹²⁸. As one prints the patented invention for commercial use, he or she becomes liable for directly infringing a patent, even if he or she does not know about the existence of the patent. Direct infringement does not require knowledge of the patent. The patent owner can indeed sue the end user for infringing his or her patent which is printed using a CAD file downloaded from a file-sharing website. This however, would mean suing potential customers.¹²⁹ The music industry faced a same kind of problem when illegal digital downloads boomed in the very beginning of the millennium. Peer-to-peer file-sharing platforms of the same kind will be distributing CAD files all over the world as they have been doing with music.¹³⁰

The patentee who goes for this avenue of pursuing protection through a claim of direct infringement will now face another challenge. Due to widespread and decentralized making of the patented inventions, it is almost impossible to identify the infringer.¹³¹ At least finding out the infringer would probably take a lot of time, effort and assets. Users

¹²⁸ Ibid. 90

¹²⁹ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1333, University of California, Davis Law Review 2015, Volume 48

¹³⁰ Napster as the best known peer-to-peer platform to share music between users.

¹³¹ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1332-1333, University of California, Davis Law Review 2015, Volume 48

of the file-sharing websites are basically anonymous. It would take great lengths from the patent holder to navigate his or her way to the directly infringing end user. Another thing is, that even if the infringer was found the patentee would face other difficulties enforcing his rights. These difficulties could present themselves through obstacles of the principle of territorialism and the competent jurisdiction, or the simple fact that the patentee would have to sue all the people, infringing his or her patent, separately possibly causing dozens of expensive and time consuming legal battles. This does not seem like the most effective way for the patentees to enforce their rights to their patent.¹³²

Direct infringement of a CAD file

To directly infringe a patent, one must make, use, offer or put on the market the patented invention.¹³³ As for now, the CAD file is not interpreted as infringing. To be fair, it has not really been interpreted at all. However, Ebrahim suggests that direct infringement of a CAD file could be a better way for the patentees to protect their patents. Could or should there not be a difference made between the tangible item – the patented physical invention – and the intangible presentation of exactly the same invention? Could or should the tangible and the intangible be interpreted as the same product?¹³⁴ The courts will face a great issue, when they will have a case at hand and they need to decide whether a digital CAD file should be treated as equal to the tangible patented invention.¹³⁵ At the end of the day, no one is going to purchase or even download for free a CAD file only to have the file itself. The reason for acquiring the file is most likely to print out the product it presents. In addition, the courts have not directly stated that digital files could not constitute an infringement under Section 3, Subsection 1 of the Patents Act.

Of course, the digital aspect of CAD files brings its own spice into the pot, but the owner of a CAD file could be at least easier to track down than the end user of a desktop 3D printer.¹³⁶ The digital form of the files means that they are capable of being transferred in a no-boundary environment over the internet. This makes it very difficult and, in some

¹³² Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 50, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

¹³³ Section 3, Subsection 1, Paragraph 1 of the Patents Act

¹³⁴ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 51-52, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

¹³⁵ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1355, University of California, Davis Law Review 2015, Volume 48

¹³⁶ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 51, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

cases, impossible to investigate or collect evidence of an infringement, moreover, to calculate the losses of patent owners.¹³⁷ However, it is more likely to get the information of an infringing CAD file owner because the website hosts may be co-operative in this sense and give out the IP-address that can help tracking down the owner.

According to Ebrahim, the focus in comparing the digital embodiment of the product, which the CAD basically is, and the patented tangible product should be directed to different aspects: time to transition, complexity of the transitioning and degree in transforming from intangible to tangible product. These aspects would disclose how close the tangible and the intangible items are to each other and suggest that it may be possible to interpret them as identical items. This is the most essential factor in the light of direct infringements of a CAD file. If it cannot be settled that CAD files could be treated as equal to the invention it represents, the whole claim of direct infringement will not be possible against the CAD file owner or maker. As support for this claim, the patentee could point out that in the past decade, there have been changes to the direction of equating the electronic media and the equivalent tangible product; e-books v. books, thumbnail images v. photographs and MP3 v. songs.¹³⁸ Pursuant to this kind of argumentation the patentees could try to justify the claim for direct infringement. By representing the CAD file as an equal – only a press of a button away from the tangible item – to the patented product, making, offering, putting on the market or using such file could constitute as direct infringement.

Considering the CAD files further, we could discuss whether the mere creation of these files could actually constitute making of the patented invention.¹³⁹ The mere creation as such should not be able to constitute a direct infringement due to the exemption of private use. However, there are already a number of websites that facilitate CAD files that are freely downloadable.¹⁴⁰ These intermediaries passively host hundreds of thousands or even millions CAD files but not necessarily know about the existence of specific patent infringing CAD files.¹⁴¹ It might be difficult to fit this kind of free of charge sharing to the doctrine of commercial use of the patented invention. However, as

¹³⁷ Xin, Liu; Xiang, Yu – Potential Challenges of 3D Printing Technology on Patent Enforcement and Considerations for Countermeasures in China, p. 159, *Journal of Intellectual Property Rights* (2015), Volume 20

¹³⁸ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 52, *Northwestern Journal of Technology and Intellectual Property*, Volume 14, Issue 1

¹³⁹ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1364, *University of California, Davis Law Review* 2015, Volume 48

¹⁴⁰ See for example GrabCAD (www.grabcad.com) and Thingiverse (www.thingiverse.com)

¹⁴¹ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1377, *University of California, Davis Law Review* 2015, Volume 48

referred above, one discussion point could focus on the Government's statement, that already promotional steps towards bringing the availability of a product to knowledge of a third person, could be considered as infringing act, such as offering and putting on the market. Put in another way, taking any action towards offering or putting on the market could constitute an infringing act. Applying this way of thinking to the perspective of CAD files and the online sharing platforms, this could be considered as taking action towards bringing the availability of the product to someone's knowledge. Is this still enough to constitute a direct infringement? I do not think so and neither does Norrgård.¹⁴²

Direct infringement due to the doctrine of equivalency

While it might be very difficult and maybe even impossible to directly fit the CAD files, as such, in the scenario where it would be directly infringing, the doctrine of equivalency could offer some relief here. This doctrine stems from case law, as it has been noticed to be necessary in fulfilling the gaps of the scope in the protection of patents on case-by-case bases.

As mentioned above, the meaning behind this doctrine is to somewhat release the courts from the strict wording of the patent claims to also catch the ones trying to avoid the liability from an infringement by only making minor changes to the patented product. The doctrine of equivalency is not the primary way to look into the accused infringing product and compare it with the patented invention. It only steps in as a secondary way to interpret the similarities between these products when a specific element of the patent claims is not found in the accused infringing product. In these cases, the first assumption is that there is no infringement at hand.¹⁴³ The equivalency may come into force if the accused product substantially performs the same function in the same way as the patented product and results in the same substantial outcome.¹⁴⁴

The doctrine of equivalency is used as a device to help the process of comparison between the allegedly infringing product and the patented invention. However, this doctrine is also used in situations when a patent is applied for and it has to be examined if it is actually new as the patentability requires for the patentable inventions to be. As

¹⁴² Ibid. 95

¹⁴³ Palm, Jukka; Konkonen Tomi, p. 745, Patentin suoja-alasta – suutaviiva-ajattelun nousu ja tuho? Defensor Legis N:o 5/2007

¹⁴⁴ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 54, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

mentioned above, equivalency is not included in the wording of Section 39 of the Patents Act but it is allowed by the wording to use such doctrine to broaden the interpretation. However, something to be taken into account is that the amended supplementary protocol of the European Patent Convention Article 69 emphasized the relevance of this doctrine.¹⁴⁵ In the interpretation of equivalency, the essential elements that are included in the patent claims should, one by one, be reflected on each essential element of what the CAD consists of. The CAD file cannot be said to function, but it substantially enables the same functions and outcome, as the invention it represents when printed out. It is yet again, a question of how far are the courts willing to stretch the doctrine.

Using the doctrine of equivalency among a claim of direct infringement by CAD file would also surpass the difficult question of whether the CAD file can be treated identical to tangible items. Hence, CAD files would not need to be interpreted as means related to essential elements of the invention at all. The patentees could argue that CAD files are type of change or permutation of a patented device and it could not have been foreseen at the time of appliance of the patent. However, substantially the CAD file would be equated to the physical form of the patented product.¹⁴⁶ As Ebrahim puts it: “The slight deviations in the CAD files are inevitable and at the very heart of the type of changes that the doctrine of equivalents was created to capture.”.

4.3 Contributory infringement in light of CAD files

General

The doctrine of contributory infringement could be a powerful tool for the patentees to use to protect their patents, but it has not been used very often to fight infringing acts. Now, due to the increasing versatile use of internet, the doctrine has lift up its head as the possible avenue to pursue concerning patent infringements. However, because of the rare use of this doctrine, there are still open questions and grey areas within the doctrine itself. This might make it undesirable for the patentees to use as a way of protecting the patents because who would want to be the first to try their luck. It would be a different

¹⁴⁵ Oesch, Rainer; Pihlajamaa, Heli; Sunila, Sami – Patenttioikeus p. 236, Talentum 2014

¹⁴⁶ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 55, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

situation if the contributory infringement had been applied more often and would have established stable ground.

As explained in the Introduction, to 3D print, the printers need instruction to know what to print and how. These instructions are included in CAD files. A person, having the possession of a CAD file of a patented product is basically only a push of a button away from having the possession of the actual physical product.¹⁴⁷ CAD files are not often or at all, at least yet, included in the patent claims when applying for a patent for an invention. As 3D printing becomes more common, and desktop 3D printers start appearing on everyday people's desks, at least the patent holders might start questioning the effectiveness of the enforcement of the protection of their patents. To keep it simple, CAD files are digital files that do not recognize state borders which will make it even harder to make sure your patented invention is and stays safe and protected. No one can really keep track on what people are printing in their homes and for which purposes.

The CAD files are in many ways similar to MP3 music files that started the same kind of disruption that CAD files will start in the near future.¹⁴⁸ From the copyright side of the table, we have learned that suing the end users was not the way to go. It only scared possible customers away. Now, we have Spotify, Netflix, and what not, reducing the illegal downloads and distribution, and making sure that the people who own the rights to these kind of works get their benefits that they are entitled to. CAD files are a significant factor in a discussion of economic development. The availability of these kinds of files affects the prices of the patented inventions and can create remarkable losses in sales for the patented.¹⁴⁹ Losses in sales are, however, very hard to prove, since there are no restrictions on how many of the patented inventions people can make with the CAD file for that invention. The CAD files are reusable, which makes the situation for the patentees even more difficult to handle.

CAD files and file-sharing websites make it very easy for everyday people, anywhere in the world, to make and use patented products without paying for them and even without anybody knowing about it. The enforcement of the patent protection gets more and more difficult as the websites enable decentralized making and using of the patent. It is

¹⁴⁷ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1331, University of California, Davis Law Review 2015, Volume 48

¹⁴⁸ Osborn, Lucas; 3D Printing and Intellectual Property, p. 258, (2016)

¹⁴⁹ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 53, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

important to keep in mind the principle of territorialism¹⁵⁰ which is actually stated in the statute of contributory infringement.¹⁵¹ Because of the widely spread digitalization, the patented products can spread all over the world in a second and create a huge challenge for protecting the patents.¹⁵² Patents are usually applied in those countries that the patentee thinks his or her invention will have a great market space. As the sharing of CAD files makes the invention available all over the world, the patentee loses his or her control over the use of the product and cripples the core meaning of the exclusive right to one's patent. This leads to great losses in sales and reduces the value of the invention.

A CAD file can partly be equated with blueprints or molds. Even though, the basic idea of all of these is to create a model or instructions for building the wanted invention, there is a significant difference between these objects. If you possess the blueprints for an invention, it still takes a lot of effort, knowledge and probably also time and money to actually make the physical product presented in the blueprints. This is not the case with CAD files. Like said many times, if you have access to a 3D printer and you have the CAD file, you can effortlessly turn the file into the physical object. It is said that CAD files are precursors to the inventions and present the whole object in a digital form.¹⁵³ 3D printing technology is making the manufacturing of even a little bit more complex objects easier for everyday people. A question arises if there is a real difference between having the physical object to having the digital presentation of the object.

In the context of 3D printing and CAD files, contributory infringement would possibly be the most logical avenue for the patentees to pursue the protection of their patents. At this point, however, nearly every little term has to be defined from a new point of view for the present legislation to stay applicable as the digital development takes over. Since, there have not been cases concerning these issues in the Finnish courts or the European Court of Justice, we cannot say for certain how the cards will be dealt once these questions reach the courts. It is clear that CAD files do not fit the framework of the Patents Act as it is traditionally interpreted and if only the exact wording is taken into account. CAD files are somewhat an additional new aspect to the whole patent scene

¹⁵⁰ See Chapter. 3.1 Scope of the patent protection

¹⁵¹ Section 3, Subsection 2 of the Patents Act: "A patent shall also confer on its proprietor the exclusive right to prevent any person not having his consent from supplying or offering to supply any person not entitled to exploit the invention with the means of working the invention *in this country* ..."

¹⁵² Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 48, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

¹⁵³ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 52, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

and thus problematical, at least for now, as these issues have not been addressed in courts or even within the legal literature. Therefore, there is not too much material to support these ideas with.

Contributory Infringement

The most obvious scenario in this context is the following. A random consumer creates a CAD file presenting a patented invention and transfers it directly or indirectly to a third person. This transfer can take place in various ways, for example by uploading it on a peer-to-peer website to share it with every user on that site. A user then downloads the CAD file for free or purchases a copy of the file to eventually print the product it presents.¹⁵⁴ As established earlier, the catch here is that even though the end user is making the product, which would constitute a direct infringement, often this making would fall into the scope of non-commercial use¹⁵⁵. Now, there may be millions of people *making* the product for private use which would mean that there would not be a remedy for the patentee to seek for. Some of them may be making the products also for commercial use, but the patent holder would still need to find them, to sue them for direct infringement. Hence, if the provider of the CAD file could not be held liable for indirect i.e. contributory infringement, the patentees would not have any way to enforce the protection of their patents. In this case the free sharing of CAD files would probably lead to the whole patent system to be wrecked.

Contributory infringement may also arise in a situation where a service provider is hosting a peer-to-peer file-sharing website, where consumers can freely upload CAD files to, and other users can freely download or purchase copies of these files from the site. It could be interpreted in this scenario, that the website host is supplying or offering to supply third persons with *means related to essential elements of the patented invention* and thus infringing the patent.¹⁵⁶ Further, if the service provider hosts these files, offers additional services, for example modifying the CAD files, and eventually prints out the products due to an order and ships them to the customer, liability may fall on the

¹⁵⁴ Ebrahim, Tabrez Y. – 3D Printing: Digital Infringement & Digital Regulation, p. 46, Northwestern Journal of Technology and Intellectual Property, Volume 14, Issue 1

¹⁵⁵ Section 3, Subsection 3 of the Patent Act

¹⁵⁶ This of course in case of CAD files interpreted as means.

shoulders of the internet service provider.¹⁵⁷ This however, would most likely fall into the scope of direct infringement rather than contributory infringement.

It seems unarguable that the person or entity providing the CAD files should be able to be held liable for infringing the patent. Considering all these scenarios that roam around the fact that someone is providing a CAD file – that could be interpreted as means relating to an essential element of a protected invention and hence, constitute an indirect infringement – the crucial factor is, that the CAD file is made accessible to people who are not entitled to exploit the invention¹⁵⁸ in accordance with Section 3, Subsection 2 of the Patents Act. This is exactly what the doctrine of contributory infringement has been created for.

As referred above in Chapter 3.3 *Contributory infringement*, the U.S. Patent Act requires selling or offering to sell a component for a contributory infringement to happen. The Federal Circuit has established that not all transactions where the infringing item is donated or otherwise given, away for free could constitute as *sale*. It has defined sale as “1. The transfer of property or title for a price. 2. The agreement by which such a transfer takes place.”¹⁵⁹ This seems to be a problem when masses of CAD files can be uploaded on a file-sharing website and be downloaded for free. The fact that sale requires a payment could create a barrier to lawsuits based on contributory infringement.¹⁶⁰ If the interpretation stays narrow and excludes free transfers, the contributory infringement is not applicable. According to Brean, the only way likely to succeed, in enforcing the protection of patents, is through active inducement under 35 U.S.C 271 (b).¹⁶¹

Thankfully – for the patentees – the wording of the Finnish Patent Act is a little bit more far-reaching as it does not exclude free distribution from the contributory infringement. The biggest issue on our behalf is the interpreting of means, which I will enter next. Although the U.S. also has this same issue with the interpreting of components. At least we have one problem less to think about in the Finnish perspective.

¹⁵⁷ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 862, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

¹⁵⁸ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 863, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

¹⁵⁹ *NTP, Inc. V. Research in Motion, Ltd.* 418 F.3d 1282, 1319 (Fed. Cir. 2005)

¹⁶⁰ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1346-1347, University of California, *Davis Law Review* 2015, Volume 48

¹⁶¹ Brean, Daniel – Asserting Patents to Combat Infringement via 3D Printing: It’s not “Use”, p. 804 (2013)

Means in the light of contributory patent infringement

In Finland, to indirectly infringe a patent, the infringer must know about the patent or should know about the existence of the patent due to surrounding circumstances if they are obvious enough. Also, the contributory infringement requires inducement by the infringer, in case the element is already put on the market.¹⁶² Further, the contributory infringer must supply or offer to supply the direct infringer with means related to an essential element of the patented invention. The definitions of means and essential elements are explained above in the Chapter 3.3 *Contributory infringement*, under *Means and Essential Elements*.

Now, there is a question if a CAD file can be interpreted as an essential element of the patented product. Further, it is a question of what CAD file actually is. Could it be considered as simple and abstract instructions? If so, it would mean, as referred above under Chapter 3.3¹⁶³, that CAD files could not qualify as *means*. On the other hand, could the CAD files be equated to software and computer programs? CAD files are created by using a software design for creating three dimensional models. Whether a CAD file is software itself remains uncertain. There are dissenting opinions on what CAD files are which can result in very different outcomes considering the interpretation of CAD files' status within the patent legislation.

Others consider them as software and others as artistic or literary works.¹⁶⁴ Taking into account the intended use of the CAD files, considering them as artistic work protected by the copyright system, would not really protect the functionality of inventions. It has been expressed that if, and only if, CAD files would fall into the scope of copyright protected works, it would be only protected as pictorial, graphic, or sculptural (PGS) works.¹⁶⁵ Of course, it is good to note here that not all CAD files represent a patented invention. Copyright protection would cover CADs that represent, for example, sculptures, jewelry and such but leave out functional products. In other words, this means that the copyright protection would be only attached to the expression of the computer code.¹⁶⁶ This would leave out the functional aspect of a CAD file. This view

¹⁶² Section 3, Subsection 2 of the Patents Act.

¹⁶³ See title: Means.

¹⁶⁴ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 863, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

¹⁶⁵ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1382, University of California, *Davis Law Review* 2015, Volume 48

¹⁶⁶ Mendis, Dinusha; Secchi Davide – A legal and Empirical Study of 3D Printing Online Platforms and an Analysis of User Behaviour, Centre for Intellectual Property Policy & Management, Volume 2015/41 (March 2015)

has also been supported by the CJEU stating in SAS Institute Inc. that “*functionality, language and data file formats are not protected by copyright under the Software Directive.*”¹⁶⁷

It is difficult to set CAD files in frameworks we already know the contents of, because CAD files are rather new development within this technology and have some special features that earlier frameworks related to patent legislation do not include – the aspect of digital form for example. Maybe it would be easier to only define digital files including CAD files, as such, and create a whole new framework – or broaden the old framework – into a form that these files could fit into.

When the courts have to take a stand on the matter of digital works being applicable to be considered as *means*, it will be a great step towards clarifying the view on the issues referred in this study.¹⁶⁸ One of the interesting factors here is the fact the CAD file remains existing independently even after the product it presents is printed out.¹⁶⁹ Basically, there is no limit on how many products can be printed with only one CAD file. This would support the arguments stating CAD files being only instructions to the product. However, as established in SINTEF, the Supreme Court stated that supplying pure information does not fall into the scope of Section 3, Subsection 2 of the Patents Act, but supplying anything more than pure information might constitute a contributory infringement. As it seems, CAD files are not pure information but consist of something more.

Even though, throughout most of the references of this study, and in this study, CAD files are pictured to be only a push of a button away from the physical form of the invention it represents, it has been noted that this is not exactly the simple truth. It is more of a simplified truth. The currently-available desktop 3D printing technology actually requires further technical steps before the actual printing. This is due to the fact that the CAD files shared on the peer-to-peer platforms online, are often offered without the related and required 2D drawings that include relevant information concerning the arrangements of the invention – the actual detailed blueprints and instructions. Without these additional instructions, the printing will be hard since it might print out imprecisely

¹⁶⁷ SAS Institute Inc., v. World Programmin Ltd. (C-406/10)

¹⁶⁸ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 863, Oxford University Press, Journal of Intellectual Property Law & Practice (2015), Volume 10, No. 11

¹⁶⁹ Ibid. 157

to fit the wanted purpose.¹⁷⁰ The lack of this additional information will not be as important when printing a whole invention, but when printing, for example spare parts for an excising invention, the printed object has to be precisely right for it to be able to put the invention into effect.

The Patents Act¹⁷¹ sets down that computer program is not patentable as such. However, the Government has stated¹⁷² that computer programs are patentable as a part of a larger entirety of an invention. Hence, computer programs can be interpreted as means related to the essential elements of patented inventions. This statement shakes down the wall between the tangible and intangible items. If an intangible computer program can be means for an essential element, why could an intangible CAD file not be. To clarify, the CAD file works as a precursor to the entire invention and not as a part of a larger entirety, this parallel might not be trouble-free and awake further questions.

The same idea has been confirmed by the Supreme Court of the United States. In *Microsoft Corp. v. AT&T Corp.* the Court stated that components, in the context of software, can be digital in nature when part of a larger software architecture or method.¹⁷³ Many software related inventions in the States are claimed as methods. According to Holbrook and Osborn, the courts consider the software functionality to be a component of the method of creating or editing files. For example, an XML editor would be considered a method of editing an XML document.¹⁷⁴ The Supreme Court made also an important difference between software “in abstract” versus software “on a medium” whereas software on a medium could be a component as software in abstract could not. This would point us in a direction where a CAD file which is stored on a tangible medium, could possibly constitute as a component i.e. means. However, this decision does not at all address software that would present the whole invention, but it states that software that makes a component for the invention is not a component itself, as if, a machine that makes components is not a component of the invention.¹⁷⁵ And then again, this would point us in the opposite direction. In *Align*¹⁷⁶, the Commission looked

¹⁷⁰ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 864, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

¹⁷¹ Section 1, Subsection 2, Paragraph 3 of the Patents Act

¹⁷² HE 139/1979

¹⁷³ *Microsoft Corp. v. AT&T Corp.*, 550 U.S. 437, 449-52 (2007)

¹⁷⁴ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1347, *University of California, Davis Law Review* 2015, Volume 48

¹⁷⁵ *Ibid.* 172

¹⁷⁶ See Chapter 4.1

for support from various court decision concerning software but did not directly reflect digital files with software. It found digital files themselves to be included to be *articles* which are comparable to *components* (or *means*) in the context Patent Act.

It all comes down to the interpretation of *means*. It might not be possible to interpret the term *means* to cover CAD files based on the plain meaning on the term, but it might be possible and logical, through a purposive interpretation.¹⁷⁷ It may also be unnecessary to try to interpret these kinds of digital files through software. It may only make it more complex than it already is. However, software makes a good supporting argument for the CAD files to be able to constitute a means. As the Commission did in *Align*, the clearest and the simplest way of interpreting digital files, in the context of means, might just be interpreting them as such. However, as stated, the support from the interpretation of software will probably help, as the questions can be identified as relatively new intangible and digital items.

If the courts decide not to go with the interpretation of giving the CAD files the status of means, there is very little of what the patent holders can do to protect their inventions within the present legal framework. The indirect infringement will then only offer a weak protection toward the infringers. If the case law builds on not including the CAD files into the definition of means, we will probably need an enactment of the current Patens Act to to be able to enforce the core purposes of the act and effectively protect the granted patents.

Essential elements

As stated above in Chapter 3.3, the interpretation of essence is closely linked to the patent claims registered with the application of the patent. The patent claims usually list all the elements that are essential to the invention but also include elements not fundamental to the invention to work. For example, a tin plate which is meant to be the cover for an invention is probably not essential enough to qualify in the context of interpreting indirectly infringing elements. In other words, the tin plate is not essential in putting the invention into effect. Another question is whether something, not mentioned in the patent claims, could be considered as an essential element. In this

¹⁷⁷ Holbrook, Timothy R.; Osborn, Lucas S. – Digital Patent Infringement in an Era of 3D Printing, p. 1348, University of California, Davis Law Review 2015, Volume 48

study, of course, it is the matter of CAD file considered as means related to essential element even when not listed in the patent claims.¹⁷⁸

The question of the possibility of adding CAD files as one of the claims for a patent has already been raised. If this could be possible, the CAD files would then constitute the whole essential element and not only means related to an essential element of the invention. One way to reason, for CAD files to be essential elements of a patented invention could be through the argument of that it actually enables the making of the product. Printing a product through a desktop 3D printer is more efficient and cheaper than going through the whole traditional procedure of making the product in question. The CAD files make it possible to substitute the whole traditional procedure by 3D printing. As such, we could argue that CAD files are essential elements to the invention, since without them, 3D printing the products could not be possible.¹⁷⁹

¹⁷⁸ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 864, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

¹⁷⁹ Ballardini, Rosa M.; Norrgård, Marcus; Minssen, Timo – Enforcing patents in the era of 3D printing, p. 864, Oxford University Press, *Journal of Intellectual Property Law & Practice* (2015), Volume 10, No. 11

5. SUGGESTIONS

Since, we cannot say for sure how this all is going to play out, the only way to prepare ourselves for the misuse of patented inventions is to work on other creative ways to restrict the infringing use and distribution of CAD files. Establishing a valid and stable case law that clarifies the interpretation of the law will take years. Maybe, even longer than what an actual enactment of the Patents Act would take. It does not seem wise for the patentees to stay put and do nothing. While waiting for either the changes of the law or case law to build up the patentees may be suffering remarkable losses because the only clear avenue to pursue to enforce their rights is through direct infringement. Direct infringements are, for sure, happening all around the patentees but, as stated, tracking down these infringers can be very time consuming and expensive. This is why the patentees should prepare themselves and take these new ways of using and distributing into account in their business plans. Here are some suggestions that might to a certain extent at least help keep the patent holders' patented products in control and not spread like a wild virus around the world.

5.1 Digital Rights Management

One avenue for the patentees – or anyone who wants to profit from CAD files – is to try to seek for protection for the CAD files by self-help technologies which control the access to the file. Collectively, these types of technologies are generally called Digital Rights Management (DRM) systems. These systems can include encryption, streaming technologies, password protection and more.¹⁸⁰ For example, in the 3D printing context, it can be set to limit the number of products the copy of a CAD file could actually print out.¹⁸¹ This would be the system that is embedded in the printer itself and the CAD files. As a CAD file with such limitation is transferred to the 3D printer, the printer would not print more objects of that same file after the limit is up. This kind of system will probably be inserted into the commercial desktop printers. However, as long as people use self-built 3D printers, these kind of restriction systems will most likely be and stay absent.¹⁸² It is also stated that DMR only prohibits unsophisticated users from using the file

¹⁸⁰ Osborn, Lucas; 3D Printing and Intellectual Property, p. 264 (2016)

¹⁸¹ Hausman, Kalani K; Horne, Richard – 3D Printing for Dummies, p. 128, John Wiley & Sons, Inc. (2014)

¹⁸² Hausman, Kalani K; Horne, Richard – 3D Printing for Dummies, p. 128, John Wiley & Sons, Inc. (2014)

however they want. More sophisticated users will always find a way to circumvent the DRM.¹⁸³ Also, for those products that are easy to scan, the DRM will be a weak tool of protection.¹⁸⁴

5.2 Licensing

Another way for the patentees to seek protection for their patents would be licensing. This is nothing new but the patentees should wake up to see that the licensing option could be applied concerning the CAD files as well. Licensing of patents is regulated under Chapter 6 of the Patents Act. By giving a license, the patentee gives another person or an entity the right to commercially use his or her invention.¹⁸⁵ The patentee, as for the licensor, could for example license the right to use his or her patent by giving the licensee the right to scan or otherwise make a CAD file of the patented invention and then sell that CAD further to end-users via an online service. If the patentees license the rights to make and distribute CAD files representing their patents, it could benefit both parties. It would probably also ensure the quality of the CAD files. Hence, also the end-users who finally purchase the file would be happy to get the perfect CAD file fulfilling their needs.

Licensing has solved or at least remarkably reduced the illegal downloading of music, movies and other similar files. People are most likely to purchase safe files than download for free possibly corrupted or malware infested CAD files.¹⁸⁶ As mentioned above, for example Netflix, Spotify and YouTube are great examples of doing business through licensing of intellectual property owned by other people and entities. They have lowered the costs of single items, made the access to these file very easy and opened new markets for digital content.¹⁸⁷ Simply, the licensee pays a fixed amount of royalties to the licensor for the agreed intellectual property; songs, movies, etc. Then the licensee can further host these websites, where people listen to them or watch them usually for a fixed monthly fee. The licensing agreements can be drawn however to satisfy both of the parties and of course taking into account the items being licensed. For example,

¹⁸³ Osborn, Lucas; 3D Printing and Intellectual Property, p. 264 (2016)

¹⁸⁴ Osborn, Lucas; 3D Printing and Intellectual Property, p. 265 (2016)

¹⁸⁵ Section 43 of the Patents Act

¹⁸⁶ Desai, Deven R; Magliocca, Gerard N. – Patents, meet Napster: 3D Printing and the Digitalization of Things p. 27, Harvard Journal of Law & Technology, Volume 26. (2012)

¹⁸⁷ Ibid. 175

Spotify pays about 70 % of their revenue back to the right holders. The 70 % is then divided between the right holders according to the popularity of their music.

Licensing agreement is not tied to a specific form but to avoid any future problems, it is advisable to make it in writing. Due to the technological nature of 3D printing and CAD files, CAD files would probably need to be licensed through a technology licensing agreement. This kind of licensing has developed among the rapid increase in different technologies. Technology licensing agreements are very complex and the agreements demand a very careful approach taking into account several complex factors.¹⁸⁸ However, these kinds of agreements can help the fight against the infringing use of patents through CAD files by reducing the end-users' willingness of making or downloading these files.

By making the CAD files easily available for an affordable price for prospected customers from a reliable source, it would probably reduce the desire for the customers themselves to put in the effort of making these CAD files themselves or downloading them from an unreliable source. Within the licensing agreements, the parties can agree on the terms and the purpose of the agreement in a very detailed manner. This would work as a guarantee of high quality CAD files for the customers using the CAD files. These kinds of arrangements have worked in the music, book and movie industry, so why would it not work on the field of 3D printing and CAD files. For certain, this will not delete the whole problem of possible infringements through CAD files, but it most certainly will reduce the risks leaving all the parties satisfied.

¹⁸⁸ Oech, Rainer – IPR-sopimukset, kilpailu ja suojan toteutuminen – immateriaalioikeuksien hyödyntäminen, p. 12. Edita Publishing (2007)

6. CONCLUSIONS

Whether we like it or not, the 3D printing technology will change the way of business, manufacturing and transportation. There is no room wonder why, it is called the Third Industrial Revolution. It will change the world as we know it from tangible to intangible and so on. It will change the traditional business models and more. It will save human lives. However, there is the other side to all these glorious expectations. It will reduce the need for human labor in the simplest stages of manufacturing, which will probably result in unemployment rocketing sky high. Mostly this will affect the developing countries where the industry giants have originally transferred their manufacturing facilities, to lower the costs of the products and to maximize their own profits. Now they may shift the manufacturing back to the country of origin, leaving the developing country standing on their tiptoes.

Furthermore, the 3D printing technology will not only effect the economic or environmental aspects, but also the legal side will be playing a great role guiding the way of technology's development. The 3D printing technology has not yet effectively started the disruption, but when it does hit the world, the whole world will for sure suffer from a serious concussion, and recover when everyone starts to operate accordingly. This is one of the reasons why we have to start discussing these issues before the disruption really begins.

Digitalization is nothing new, but somehow it seems like we choose to ignore it until it forces us to face the facts. It is the same kind of situation with winter in Finland every year. People will not take the icy roads seriously until the first pile-up collisions occur. People tend to hold on to the old things before they are actually forced to take in the new. This is often emphasized in the context of legislation as it drags behind the development. A great example as for right now is the question of legality of Uber. It has now reached the courts, and the conclusion for now was that it is illegal to drive Uber without a taxi license. However, due to the enactments in the transportation legislation, in about two years Uber will be perfectly legal to drive. It is great that the Government is doing something about the situation but it is still too slow. We could have begun the discussion about this new way of transportation long before it physically stranded to Finland. Now we have a great chance to be prepared for the changes relating to the patent system due to customer-level 3D printing.

There are several factors to be considered here. The sooner the people and businesses start taking this technology in to account, the fewer damages will be suffered. The entities that are in any way in connection with the 3D printing technologies have to take a stand themselves and not just wait around for something to happen. Even when the legislation is amended into a more allowing way, it may take years to enter into force, like in the case of Uber described above. This is why actions to reduce the risks of infringement need to stem from the patentees themselves. As suggested above, there are several things that patentees can do to help to protect their inventions. If there is no clear legal remedy to protect your invention, try to look around for other possibilities to reducing the risks of infringement.

The legislation applied in the context of 3D printing and CAD files is completely – at least for now – a question of interpretation of the law. As we have established here, there is no case law – or very little of it – concerning patent infringements in Finland. This leads us to the need of looking for case law further away, which I have done here. Due to the fact that there are a number of international patent conventions that result in overlapping of patent legislation all over the world, the patents systems are at least to some extent harmonized. This does not mean that the patent legislation would globally be the same. It means that the frames and the ideas behind the patent systems of the contracting parties of the international patent conventions are similar. Especially, in the world of digitalization it is very important to take into account the whole world and not exclude ourselves from the surroundings. The platforms, for CAD files to be shared on, are international. Put in another way, a CAD file uploaded on the sharing website in Finland can end up being downloaded in Nigeria.

I think it is very important to follow the situation and the direction in which the 3D printing technology will begin to move in the United States of America. Most likely these issues and questions will begin to reach the U.S. courts in a shorter time frame than here in Finland or even Europe, because of the States' current status as the market leader. Most desktop 3D printers, at least for now, are sold in the States. Also the biggest CAD file sharing websites like Thingiverse, 123D, GrabCAD are based in the States and controlled by U.S. legislation. As established, the purpose of the patent infringement rules is the same in both continents, the U.S. and Europe, even though the wordings differ between the legislations.

It is good to take the principle of territorialism into the consideration here. This is one of the parts of the national legislations that may need to be reconsidered due to the use of peer-to-peer platforms that are not limited to geographical state borders. This principle may lead to several problems if the countries cannot establish some kind of common consensus on how to proceed with this principle in a case of patent infringements. For example, the contributory infringement rule is only fulfilled when the supplying or the offering to supply happens “in this country”. This would mean that if the infringing CAD file would be uploaded in another country, it could not be found infringing in Finland under the current state of the regulation. Should the CAD file be considered be uploaded in the country where the service provider is based in? There is no way to tell where the CAD file might be downloaded for printing. This clearly demonstrates the complexness of trying to catch the end user for direct patent infringement. It is also presumable that patent protection has not been applied for in every possible country in the world. Hence, the end user may not even be infringing the patent by using and making the invention for commercial purposes. This is why it is very important to be able to use an effective legal remedy against the owner of the CAD files. Otherwise, the principle of territorialism may restrict the remedies to the extent that there will be none for the patent holders to pursue.

The question of which of the parties shall be held liable for the infringement is still lingering on. Based on the current state of legislation the situation is not certain. As established above, there are the end users that could be held liable for making and using the patented invention. However, this will probably not be the most effective way of protecting patents. First of all, there is the exclusion of non-commercial use, which most of desktop 3D printer use will result in. People will print items on-demand for their own needs. Another thing is the fact that these users will be spread out around the world. If the acts of infringement pursuant to Section 3 of the Patents Act take place anywhere else than Finland, they would not constitute an infringement even if they were intended for commercial use. Of course, if the patent was valid in the country the infringing making took place, it would most likely constitute a patent infringement in that country. Taking into account these factors and everything that has been said above, going after the end users of the desktop 3D printers will not delete the problem that arises from the distribution and use of CAD files. This suggests looking for another remedy. An effective legal remedy is not found here against the end users.

The intermediaries, meaning the internet service providers that host CAD files, may be a better to go after, compared with the end users of the printers. At the time of writing, the biggest intermediaries Thingiverse, 123D and GrabCad have absolved themselves from any liability in the terms and conditions.¹⁸⁹ When the time comes, that someone would sue the website for contributory infringement, it will be clarified if they can actually manage to avoid the liability only by stating that they are not liable for the infringing contents on their website. One way to reduce the amount of infringements would be to try to get these platforms to take down the infringing content by a takedown-notice. Thingiverse has for instance already instituted a policy that when given notice, the administration will remove any content that infringes intellectual property.¹⁹⁰ The platforms would most likely be cooperative since it is still unclear if the platforms could or could not be held liable for providing this infringing content. Until it is established that they could not be found liable for contributory patent infringement, they may want to protect themselves, by taking down any content they are asked to take down. However, these internet service providers' only purpose is often to host a platform that enables the file sharing between the users of the platform. This may not be enough for the courts to find liability only because of hosting the platform. As it has been said, these platforms often host hundreds of thousands or even millions files which make it basically impossible for the administrators of the sites to have knowledge of every infringing or not infringing file.

Now, there is only one party left for the inspection. The owner or the creator of the CAD file, the person who uploads the CAD file on the peer-to-peer platform for the file to be available for downloading worldwide. To me, this person should be able to be held liable for patent infringement either through a claim of direct infringement due to the doctrine of equivalency or contributory infringement by interpreting the CAD file as means. Basically, without this person the making and sharing the CAD files, even the risk of direct infringements would reduce. It is only a question of how this person can be found to be liable of a patent infringement.

As stated, the contributory infringement would probably be the most obvious way to try to find the infringement. The owner of the CAD file is supplying, or offering to supply, users of the peer-to-peer platforms with a digital file which enables the users to use a

¹⁸⁹ Mendis, Dinusha; Secchi Davide – A legal and Empirical Study of 3D Printing Online Platforms and an Analysis of User Behaviour, Centre for Intellectual Property Policy & Management, p. 23. Volume 2015/41 (March 2015)

¹⁹⁰ Doherty, Davis – Downloading Infringement: Patent Law as a Roadblock to the 3D Printing Revolution, p. 363, Harvard Journal of Law & Technology, Volume 26 (2012)

patented invention by downloading this file. However, as intangible items and digitalization – especially within the patent system – are quite new phenomena, they do not fit in the frames of how means have traditionally been interpreted. Up until now, there has not been any need to even think about the intangible nature of items. However, it is becoming more and more evident that we need to begin taking the intangibility of items seriously and not try to delay it. It is happening here and now. It will take courage from the court that is willing to begin changing the whole traditional definition of means to include the digital side of technology as well.

The case law concerning patents and patent infringements in the Nordics and the U.S. has only concerned tangible items, and the traditional way of looking at *means* is that they are only tangible items. These facts do not still abolish the other fact that the term, *means*, is not defined in the legislation. There is no written law that would namely exclude intangible items. It is only a question of how the courts or other authorities want to see digital files. It is an inevitable fact that digitalization will only increase the amount of intangible items and they should not be included on every field of legislation just as tangible items.

Even if it is up to the courts to interpret the legislation, the purpose of the contributory infringement rule may not stretch to the extent in a way that it could include digital files that represent the whole patented invention. If the CAD files could be seen as means, as such, it is most likely not suitable for the exact wording of “relating to an essential element of the patented invention”. In most cases, the CAD file will represent the whole invention including all the essential elements. This may be the fact that will restrict the use of contributory infringement against CAD files. Without an enactment of the wording it may not be possible for the courts to hold the owners of CAD files liable even for contributory infringement.

We can conclude from everything discussed above, that it is still very unclear at this point whether it is in any way possible to stretch the interpretation of the CAD files to fall in the scope of the definition of means within the current legislation, or not. Even if this was possible, there are still several obstacles to surpass before the whole doctrine of indirect, i.e. contributory infringement would be clarified and desirable for the patentees to pursue. As said, the contributory infringement has rarely been pursued in the Nordic countries and never in Finland. It is, though, established in SINTEF that supplying or offering to supply software could constitute a contributory infringement. However, for

this to actually have any effect supporting the contributory infringement cases here, the CAD files would need to be interpreted as software as well.

Taking into account all the obstacles that the doctrine of contributory infringement is still facing, in the end, it might actually be easier and more effective for the patentees to pursue the avenue of direct infringement through the doctrine of equivalency. The doctrine has been used many times before and the courts have at least some kind of touch to the appliance of the doctrine – how far can it go, what does it mean and what is the purpose of it? As established above, this would save the courts from several different stages of complex interpretation concerning CAD files; beginning with questions relating to the fact what CAD files actually are, their intangible nature and if they could constitute as means related to essential elements of the patented invention.

The wording of the Patents Act does not exclude the use of the doctrine of equivalency. Hence, it could also be used to find a direct infringement by the CAD file maker who uploads the file for other users to download. The purpose of this doctrine is to complement the rule of direct infringement beyond the wording set down in the patent claims. Equivalency as a term is not defined in the act which makes it a great option to pursue in an infringement case concerning CAD files. There is no requirement of tangibility, whatsoever. Equivalency is at hand when the alleged infringing item functions substantially in the same way compared to the patented invention, and results in the same outcome with the patented invention. Thinking about the CAD files, this is not exactly what the digital representation of the patented invention does. However, eventually it results in the same as the patented invention.

The doctrine of equivalency has been used more regularly by the courts than doctrine of contributory infringement and some stable ground has been already established. Equivalency is applied when all the specific elements of the invention do not match the wording of the patent claims. Put in another way, when there is only a minor change between the patented invention and the allegedly infringing item, we need to look for the equivalency of the items. These items do not need to be the same but substantially result in the same outcome. Therefore, I would say equivalency could be found between the tangible and intangible versions of the same item.

By pursuing the direct infringement through the equivalency of the digital representation of the product – which is the only valid description of a CAD file for now – and the patented invention, the courts do not need to get into difficult questions that the

contributory infringement would require. All these above mentioned complex questions could be ignored. Here, the courts would not be strictly tied to the wording of the patent claims or the questions of what CAD files are, but actually be able to use their discretionary power to find the equivalency between the products and hence fulfill the meaning that the Patents Act is meant to protect in the first place.

For now, before any enactments of the laws, both types of infringements can be pursued; direct infringement due to the equivalency between the digital representation of the invention and the patented invention itself or through contributory infringement claiming CAD file as means related to an essential element of invention. However, there is no guarantee if in either of these avenues the infringement claims would result in a way that satisfies the patentee. It is a big change trying to move from a tangible world to intangible within a framework of acts that were written long before intangibility of items could even be imagined. This is why I would suggest that in the current state of legislation concerning patents, the best way to protect the patented inventions would be against the CAD file owner with a claim of direct infringement due to equivalency. This sets the patentees free from the risk of CAD not to be found as means.

There are remedies available for the patentees within the frames of current legislation. Other ones can be more effective than others and others may not work at all – at least in the favor of the patentee. However, the uncertainty of the success of these remedies is still high. In every case – whatever it concerns – there is uncertainty of the outcome. Legal cases are rarely straightforward but are dependent on various little factors and how these factors are represented to the court. Sooner or later a CAD file related patent infringement case will reach the courts and it is the only way to actually get clarification to this matter. It is good for the patentees to know their options and how to approach the infringers if such appear. Still, keeping in mind that cases that reach the courts are tied to uncertainty. It is best to prepare for this development of intangible and digital world protecting your patents in a way that there would not be a market for infringing CAD files.

6.1 Finally

We can be smart in facing these above mentioned issues, or not. To be smart, requires preparations. Whether these preparations require enactment of the current legislation or guidelines on the interpretation of the law in 3D related questions given by the competent

authority, they need to commence now. It is an inevitable fact that these issues will come in question, and it is in everyone's best interest to understand the process of how to proceed when facing above mentioned scenarios.

The important thing to keep in mind here is that nothing has been settled yet. It only takes one great case with great reasoning on both sides to start building a clarifying case law related to these matters. The one, who is able to reason their point of view better and convince the competent authorities, is going to be the one to show the way these matters start to move. However, as stated, it would be better if the authorities began serious discussions about this matter, so that they would stay on top of things. In any case, at least one of the parties involved in this chain of desktop 3D printing and CAD file distribution will be held liable for the damage and losses caused to the patentee. It is only the core purpose of the whole patent system to protect the patentee's exclusive right to his or her own invention.