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**Does smartphone patent enhance or detract the information
society?**

Ya-Fang Pang

A thesis submitted in partial fulfilment of the requirements of
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for the degree of Master of Laws by research

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Abstract

Functionality, simplicity, appearance, and the price are the influencing factors when consumers are choosing a phone. Thus, smartphone companies seek intellectual property protection to prevent others from replicating their creations as a way to maintain their competitiveness. Nonetheless, intellectual property rights, especially patent, have become a means to create hurdles to competitors in smartphone markets like telecommunication, handset functions and operating systems. This is due to the nature of a patent, which awards patentees with exclusivity and allows them to exclude competitors from accessing their patent. It gives right holders a chance to dominate the given markets and it is one of the main factors that constitute monopoly.

Patents can lead to the dominance of the market by a single company and they can also be utilised by non-practicing entities for profit-making purposes. They may refuse licensing competitors/inventors to use essential techniques or threaten patent litigation and demand extortionate fees; competitors/inventors would have to design around to research for advanced products. If the patent is essential as a standard, their products may be eliminated in the competitive market. Apart from hindering innovation, such patent holders may also impact the price of products.

In the light of this, this study focuses on the problem in smartphone industry. The US and EU competition cases and policies are analysed for identifying the problems in the smartphone industry and investigating the balance between patent protection and the competitive market. It should be possible to ensure benign competition in the smartphone industry so that, rather than using patents to strangle innovation, patents and competition law will work together in a way that responds to the needs of the information society. Hence, more advanced technology could be introduced to society, at a reasonable cost, which would boost the economic development of innovative industries.

Abbreviation

CFI – Court of First Instance in the EU

CJEU - Court of Justice of the European Union

DRAM - dynamic random access memory

ECJ – European Court of Justice

EPC - European Patent Convention

EPO – European Patent Office

EPOrg – European Patent Organisation

ETSI - European Telecommunication Standard Institute

FRAND term – Fair, reasonable, and non-discriminatory term

FTC – (US)Federal Trade Commission

ICT – information and communication technology

ITC – (US) International Trade Commission

IP right – Intellectual property right

JEDEC - Joint Electronic Device Engineering Council

MSs – (EU) Member States

US DOJ – US Department of Justice

OEM - original equipment manufacturer

R&D – research and development

SEP - standard essential patent

SSO - standard-setting organisations

TFEU - Treaty on the Functioning of the European Union

TRIPS Agreement – Agreement on Trade-Related Aspects of Intellectual Property Rights

UPC – Unified Patent Court (in Europe)

USPTO - the United States Patent and Trademark Office

WCDMA - wideband code division multiple access

WTO – World Trade Organisation

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Chapter 1

Introduction

The aim of patents is to encourage innovation, right holders are given a limited period of time to exclude others from utilising their intellectual efforts. This also enables the holders to authorise their right to obtain licensing fees or royalties. Yet, patent holders are required to disclose their patent in return.

In information society, the social driving force has been evolved from physical assets to intellectual knowledge.¹ The ability to generate knowledge and process becomes the key factor of competitiveness.² The large number of overlapping patents in the smartphone industry form a dense network which is known as a patent thicket and the holders' competitors and subsequent innovators need to hack their way through these patents to commercialise a new or updated smartphone.³ While patent ensures the holder's exclusive right over its patent, its opponents face more difficulty in seeking resources for further development and commercialisation because they need to be authorised to lawfully utilise the patents in the thicket environment.

When the fierce patent war launched in 2011, Apple and Samsung began to take legal action against each other in more than ten countries around the world asserting patent infringement or challenging the validity of each other's patents.⁴ The

¹ HAUNSS, Sebastian (2013). *Conflicts in the Knowledge Society: The contentious politics of intellectual property*. 1st ed., Cambridge, Cambridge University Press. p. 63.

² *Ibds.*, at p66.

³ SHAPIRO, Carl (2001). Navigating the patent thicket: Cross licenses, patent pools, and standard-setting. *Innovation Policy and Economy*, Volume 1, pp. 1-2.

⁴ Foss Patents (2012). List of 50 plus Apple-Samsung lawsuits in 10 countries. [Online] Available from:

ever-growing volume of patent litigation in the industry indicates that some patent holders block their competitors from the market by raising the entry barrier by means of patent licensing fees or patent lawsuits. Moreover, there are also some patent holders who do not practice patent for industrial application and, rather, assert patent against those to need to access it. This naturally increases the cost of research and development (hereafter “R&D”) and reduces the level of competition. The phenomenon can be attributed to the strong protection which enables patent holders to increase the cost of transactions by unduly expanding their right.⁵ Besides, the ambiguous patent scope creates opportunities for speculators to make patent enforcement a lucrative business. It is also noticed in this study that the different interpretations on patentability and patent infringement in different regions bring uncertainty to patent holders and other innovations. It increases the possibilities of unintentional infringement and therefore patent abuse problem in current patent system is exacerbated.

Such strategic patents against competitors have dramatically increased the burden of patent offices and courts. It can be seen that Apple expressed its intention to “go thermonuclear” against Android and launched many lawsuits in the smartphone patent war against rivals who have a considerable market share in operating systems.⁶ On the other hand, Google declared that the considerable patent portfolio it obtained from its acquisition of Motorola would be used for innovation and

<http://www.fosspatents.com/search?updated-min=2014-01-01T00:00:00%2B01:00&update-d-max=2015-01-01T00:00:00%2B01:00&max-results=50>. Last accessed on 3 April 2014.

⁵ CASTLE, Matthew (2012). Mobile patent wars: Is the patent system broken? [Online]: Available from: . <http://cbl.r.columbia.edu/archives/12337>. Last accessed on 6 April 2014.

⁶ SEGAN, Sascha (2012). Infographic: Smartphone patent wars explained. [Online]: Available from: <http://www.pcmag.com/article2/0,2817,2399098,00.asp>. Last accessed on 3 April 2014.

protecting its Android partners from being threatened by competitors.⁷ These firms both have an adverse impact on society because the high cost and risk of litigation to utilise these patents may deter future inventors.

The significance of patents as an incentive to attract innovative activities has grown with the change in the social pattern from an industrial and labour mode to a knowledge-based economy.⁸ Patents certainly provide short-term benefits to society because the exclusivity granted by patent right is more likely to encourage inventors to invest in innovation by virtue of the return they obtain by utilising the patent. The long-term effect of the current patent system depends on whether it has been modernised to accommodate this change and whether it effectively enhances the benefit to society. The innovation encouragement presumption is not always the case in smartphone industry where enhancing products for more income and robust competitiveness are the main concern of a company. Patent, adversely, becomes a means of increasing competitiveness by limiting the accessibility of a work and blocking competitor's opportunities on the same market. How to intensify patent system to prevent the problems occurred in such emerging industry is the main concern of this study.

The current patent law and litigation in the smartphone industry not only force individuals and small start-ups to pay unaffordable fees to put their products into the market, but it also costs giant companies like Apple, Samsung and Microsoft a fortune to raise or defend law suits. It is also worth examining if the numerous patent

⁷ ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525, p. 525, note 2.

⁸ TIAN, George Yijun (2011). Competition law and IP abuse prevention in Australia: a comparative study. *W.I.P.O.J.*, 2(2), p 217.

litigations brought to the court necessarily benefits society. If not, the current patent system seems to favour large companies because only innovators who can afford to access patents and bring infringement lawsuits can create revenue from patents. Vulnerable innovators with smaller patent portfolios and less financial strength have to overcome many hurdles before they can enjoy the advantages brought by patents.

The smartphone patent thicket is believed to be necessary to reach equilibrium in the marketplace and is a milestone in the evolution of such a complex product.⁹ A robust patent system is vital to help innovators and the whole industry to progress. In the meantime, it is also important to find a proper balance between patent law and competition law to ensure patent holder's right and to deter the abuse of patent, and further enhance the efficiency of patent system and insure the aim of patent promote innovation incentives.

Many anticompetitive investigations were held by the relevant authorities all over the world to monitor possible patent abuse that may damage market competition. The striking case of Google's acquisition of Motorola Mobility is one of the cases that attracted great attention in the EU and the US. It reveals that major company's purchasing and accumulating patents has endangered competition.¹⁰ Apart from the famous market sharers, non-practicing entities are another considerable problem. Since they do not commercialise and utilise patent, they are not afraid of being blocked from accessing other's patent and countersuits by other patent holders.

⁹ LEWIS, Jeffrey I.D. (2013). The sky is not falling: Navigating the smartphone patent thicket. [Online] Available from: http://www.wipo.int/wipo_magazine/en/2013/01/article_0002.html. Last accessed on 10 October 2013.

¹⁰ See pp.103-112 of this study for details of how the EU and the US antitrust authorities consider Google's acquisition of Motorola may harm competition.

This study agrees that patents are a beneficial and necessary incentive for innovation; yet it argues that the effectiveness of the current patent system is crippled by some underlying problems. Intellectual property has a growing significance to the economy and social benefits in contemporary society and is the driving force of technological development. In spite of the fact that standard setting organisations (hereafter the “SSOs”) like the European Telecommunication Standard Institute (known as “ETSI”) have established a system to ensure the accessibility of standardised technologies as a method to prevent the abuse of patents, patent lawsuits related to standard essential patents (hereafter the “SEPs”) remain. This is an admirable system that facilitates the acquisition of useful information and technology by gathering them in a pool. SSO should provide a clear guidance of licensing terms to ensure that the patents are available to other inventors under the appropriate conditions and establish clearer criteria for licensing essential patents to prevent the circumvention of this system.

It can be observed in lawsuits in the patent wars that the payoff from litigation and driving competition is more profitable than merely engaging in research and development (hereafter “R&D”).¹¹ In many circumstances, patent holders are eager to file litigation, rather than negotiate for cooperation. This study intends to resolve this problem by seeking to control the quality of patents to reduce the number of patent lawsuits on insignificant patents. When it comes to SEPs, antitrust authorities should provide an appropriate mechanism to encourage private agreement.

¹¹ For example, the “patent troll” Lodsys and MarcoSolve in the US earn profits by alleging patent infringement and ask for licensing fees against unwittingly infringers. See pp.48-51 of this study for more details.

Imposing licensing obligation to patent holders should be the very last device, Therefore, in order to minimise the damage to patent holders and maximise the benefits of information society, it is fundamental to ameliorate patent system and enforcement than rely on anticompetitive remedies.

Chapter 2

Literature review

2.1. Patent

The relationship between intellectual property holders and the whole of society is regarded as being a type of social contract.¹² Intellectual property is a bargain primarily for the benefit of the public.

Agreement on the Trade-Related Aspect of Intellectual Property Rights (hereafter the “TRIPS Agreement”) states that any invention in all fields of technology is entitled to be protected by patent if it is new, involve an inventive step, and is capable of industrial application.¹³ This principle is implemented in the patent law of World Trade Organisation (hereafter the “WTO”) members such as European Patent Convention (hereafter the “EPC”) in the EU, Title 35 of the US Code (also known as “the US Patent Act”), and Patent Acts 1977 in the UK.¹⁴

One of the purposes of the patent system is to impose an obligation on patent holders to disclose the essence of their innovation so that relevant products or services can be improved by others. It is argued that to regard patent rights as normal property with a monopoly over the patented work is insufficient; rather, a patent not only confers a positive right on holders to make, produce and sell the

¹² PUGATCH, Meir Perez (2011). Intellectual property policy-making in the 21st century. W.I.P.O.J., 3(1). p. 73.

¹³ Article 27 (1) of the TRIPS Agreement.

¹⁴ Article 52 (1) of the EPC, Section 101 Title 35 of the US Code, and Article 1(1) of the UK Patent Act 1977. More precisely, an invention is patentable as long as it does not form part of state of art, is not obvious to a person skilled in the art, and can be made or used in any kind of industry.

work, but also a negative right to exclude others from using it.¹⁵ Therefore, its policy-making should focus on balancing incentives to invention and accessibility.

2.2. Mobile telephony industry in the information society

According to sociological theories, social evolution has entered a new era, in which the key elements that drive social dynamics are knowledge and technological information.¹⁶ This explains the growing importance of intellectual property in contemporary society in which the economic development and political power is generated by controlling the content knowledge.¹⁷ However, due to the nature of knowledge, it can be transferred and replicated easily; it is hard to ensure inventor's complete exclusivity. In addition, the technology industry is becoming more complex because every product or service consists of lots of knowledge that is patented by different holders.¹⁸ Although patent aims to secure holder's hard work, it is noticed that the patenting intensity gives patent holders in the mobile communication industry greater bargaining chips, especially when their patents are standardised.¹⁹ Against this background, patent issues are more complex than they used to be.

This study agrees that the changing society needs a changing patent system to coordinate social demand. Yet, to inspect the needs of every single industry is hard to

¹⁵ ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525. pp. 528-529.

¹⁶ HAUNSS, Sebastian (2013). *Conflicts in the Knowledge Society: The contentious politics of intellectual property*. 1st ed., Cambridge, Cambridge University Press, pp. 53-55.

¹⁷ *Ibid.*, pp.76-78.

¹⁸ ZHANG, Liguó (2010). Refusal to license intellectual property rights under article 82 EC in the light of standardisation. *E.I.P.R.*, 32(8). p. 42.

¹⁹ ZHANG, Liguó (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4). p. 384.

be achieved; this study tend to carry on an intensive understanding of the problems of the smartphone industry and find out solutions that can possibly improve the patent protection in it. Given that smartphones are essential in this technology-driven age, the fiercely competitive marketplace of smartphones is the most intense and rapidly changing business environment today, which is why the patent controversies among smartphone and tablet companies in the past five years are referred to as chaotic frontier of innovation and development.²⁰ Therefore, this study focuses on patent issues in this industry to determine if the patent system facilitates smartphone development and enhances the benefits of the whole information society.

2.3. Patent and innovation

It has been argued that the exclusivity associated with patent right is not for the purpose of creating incentives per se; rather, it is an instrumental means to support the aim of making creators' inventions accessible to those who can use them. In other words, the ultimate goal of patent is to disseminate the invention which is socially beneficial by virtue of using the instrumental means to prevent the disruption to such acts²¹. Some may have similar claim and say that not all patent infringers are pirates, and "inventing around" the outside of a patent's scope should be encouraged. Patent authorities should ensure others' freedom to imitate and compete as long as the invention is outside the scope of the exclusivity associated with the patent.²²

²⁰ HOYLE, Ben (2013). *Apple v Samsung: lessons from a global intellectual property war*. C.T.L.R., 19(4). p. 63.

²¹ OVERWALLE, Geertrui Van and SCHOVSBO, Jens (2007). Policy options for the improvement of the European patent system. *IIC*, 38(7), p. 835; LIIVAK, Oscar (2013). Establishing an Island of patent sanity. *Cornell Law School research paper* No. 13-06, p. 4.

²² ANN, Christoph (2011). *Patents, piracy and competition*. *IIC*, 42(8). pp. 877-878.

This study does not intend to reposition the patent system. It agrees that promoting incentive is undeniably the essential goal of the patent system; however, this theory is not necessarily true in the smartphone industry, where maximising a profit is the goal of most device and service providers. Patents do not always play the role of encouraging R&D; rather they become a tool for monopoly in an intensely competitive market. Therefore, the inspection here will not only focus on the efficiency of innovation promotion, but also more importantly, how patents can facilitate the distribution of useful information rather than constrain it.

2.4. Abuse the exclusivity of patent

The most common form of abuse the exclusivity of patent is patent trolls who seek to make money by alleging infringement.²³ It is also called “patent assertion entities”.²⁴ Although patent trolls are deemed to prevail in the US patent system,²⁵ empirical research provides evidence that non-practicing patent companies do not solely operate in the US; they also appear in several European countries.²⁶ Therefore, here it is regarded as an international issue with the change of economic dynamics, although the US still has the most patent trolls. Many proposals have been made to address the problem of patent trolls. This study will further discuss other forms of abuse patent holders may exercise in the smartphone industry by taking speculative actions to increase other participants’ innovative costs or even block their entry to

²³ LIM, Daryl (2010). Post eBay – a brave new world. *E.I.P.R.*, 32(10). p. 485.

²⁴ CHIEN, Colleen V. and LEMLEY, Mark A. (2012). Patent hold-up, the ICT, and the public interest. *Cornell Law Review*, Stanford Public Law Working Paper No. 2022168. p. 102.

²⁵ SUBRAMANIAN, Sujitha (2008). Patent trolls in thickets: who is fishing under the bridge? *E.I.P.R.*, 30(5). pp. 185-187.

²⁶ FUSCO, Stefania (2012). Markets and patents enforcement: A comparative investigation of non-practicing entities in the US and Europe. *Michigan Telecommunications and Technology Law Review*. pp. 115-119.

the market.

Not only may patent assertion entities who engage in trolling behaviour be detrimental to the accessibility of patents, it has been noted that this irregular use of patents (rather than unlawful use because some are legally exercising the exclusivity that comes with patents) has resulted in “too-many patent” problems, which have further exacerbated the problems of patent trolling and ambush.²⁷

Noting that patent litigation and injunction requests had been filed worldwide, commentators referred to Judge Posner of the US District Court who used the term “chaos” to describe the US patent system and declared that an injunction required by players in the industry would be “contrary to the public interest.”²⁸ Judge Posner is not the only one to have observed that the patent system is problematic. Many have argued that the reason companies are eager to collect large portfolios is that the patent system grants patent holders too strong protection²⁹ Indeed, a patent with an over-broad scope is argued to be a serious roadblock to competition in the information technology industry,³⁰ and a “flood of trivial patents” can be seen to be spreading across the world.³¹ It is also argued that patents for emerging technologies are normally granted with an overly broad scope because patent offices are unable

²⁷ SCHREPEL, Thibault (2013). Patent troll through the US and EU antitrust law: when co-operation is no longer an option. *E.C.L.R.*, 34(6). p. 318.

²⁸ LEVINE, Dan (2012). United States: Intellectual Property – patents. *C.T.L.R.*, 18(8). pp. N212-N213.-

²⁹ OLSON, David S. (2013). Removing the Troll from the Thicket: The Case for Enhancing Patent Maintenance Fees in Relation to the Size of a Patent Owner's Non-Practiced Patent Portfolio. *Boston College Law School Legal Studies Research Paper No. 303*. pp. 10-15.

³⁰ HOVENKAMP, Herbert J. (2012). Competition in information technologies: Standard-essential patents, non-practicing entities and FRAND bidding. *U Iowa Legal Studies Research Paper No. 12-32*. p. 1.

³¹ SCHADE, Jurgen (2010). Is the Community (EU) patent behind the times? Globalisation urges multilateral cooperation. *IIC*, 41(7). p. 812.

to deal with such a large number of new, complex patent applications.³² This study refers to commentators' criticisms and finds that "bad patent" is an imperious problem that needs to be resolved in order to maximise the function of patents. However, some of those call for reform and the making of specified patent rules for different industries, which this study believes may intensify the chaos in the current system.³³ At this stage, reinforcing patent-issuing rules and moderately applying competition law to cope with undue patent exercise seem to be more appropriate options.

2.5. Interaction between intellectual property protection and competition law

Some regard patents as being a potential stumbling block to competitiveness, since there is no measuring tool to prove the effect of monopoly on the promotion of innovation.³⁴ Therefore, the aim of patent system is envisioned by the authorities rather than referring to the empirical facts in the competitive market. This comment seems too simplistic, since it neglects the positive influence of patents and solely justifies the impact from the perspective of enhancing a competitive economy. However, it does properly refer to the expression of the US Supreme Court and highlights a vital point, which is that it is necessary to "balance the need to promote innovation" and the notion of "imitation and refinement through imitation."³⁵

³² SCHOVSBO, Jens (2011). Constructing an efficient and balanced European patent system: "Muddling through". [Online] Available from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1932690. Last accessed on 31 January 2014.

³³ SCHREPEL, Thibault (2013). Patent troll through the US and EU antitrust law: when co-operation is no longer an option. *E.C.L.R.*, 34(6). pp. 320-321.

³⁴ GIFFORD, Daniel J. and KUDRLE, Robert T. (2011). Antitrust approaches to dynamically competitive industries in the United States and the European Union. *J.C.L. & E.*, 7(3). pp. 710-711.

³⁵ *Bonito Boats, Inc. v Thunder Craft Boats, Inc.*, 489 U.S. 141, 146 (1989).

It has been noted that not all patent ambushers or non-practicing patent holders are detrimental to competition; some of them, like universities, may want to use the patents for research purposes and/or do not intend to seek licensing fees to recover their investment. Moreover, there are companies whose business are to aggregate patent portfolios and license them to those who need them for innovative activities or even for defensive purposes.³⁶ They may provide licensed to entire patent portfolios; thus the licensees are able to apply the relevant patents with less transaction fees and more efficient progress.³⁷ It is actually conducive to maximising the function of a patent. This study does not challenge such patent usage because it does not harm competition, nor does it appreciate it, because it does not help to circulate patents and promote incentives for innovation. It aims to improve the current patent system and thus mainly focuses on problems that are detrimental to the public interest.

2.6. Standard essential patents and license to access

Patent law and competition law are often regarded as “conflicting in means, yet harmonious in purpose.”³⁸ In order to facilitate the interoperability and compatibility of products, which serve the same functions, standard-setting organisations are established to ensure essential technology is accessible with a license under fair, reasonable, and non-discriminatory terms (known as “FRAND” terms). Many have illustrated the advantages this can create and the difficulties faced when standardised patent holders deliberately hold-up such patents.³⁹ They also refer to

³⁶ LIM, Daryl (2010). Post eBay a brave new world. *E.I.P.R.*, 32(10). p. 485.

³⁷ ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525. pp. 526-527.

³⁸ DEVLIN, Alan (2009). The stochastic relationship between patents and antitrust. *J.C.L. & E.*, 5(1), p. 75.

³⁹ CARRIER, Michael A (2012). A roadmap to the smartphone patent wars and FRAND

the inherent problems of the standardisation procedure and the blurred definition of licensing terms.⁴⁰ Aware of these problems, this study discusses them by referring to famous patent ambush cases and analyses the deceptive conduct during the standardisation process.

To address the abuse of standardised patents, “five golden rules” were proposed by commentators to make the standardisation process and results open, transparent, non-discriminatory and without any predefinition of the standard at the early stage of standardisation.⁴¹ However, this study disagrees with the fifth rule, which suggests developing competing standards or products. Standardisation should make essential patents available to those not able to evade them rather than developing other standards to fragment the application of given technology. Preventing the abuse of standardised patents is more essential than finding a possible substitute standard. For example, one of Nokia’s patents which is adopted as a part of international GSM (Global System for Mobile) standard; it has been widely accepted in the smartphone industry. Smartphone providers have to apply such standard to be able to provide relevant service. It is hard to find a substitute to challenge or replace

licensing. *CPI Antitrust Chronicle*, April (2). p. 2.

See also CHRONOPOULOS, Apostolos (2009). Patent Standards – a case for US antitrust law or a call for recognising imminent public policy limitations to the exploitation rights conferred by the Patent Act? *ICC*, 40(7). pp. 786-789; and TORTI, Valerio (2012). IPRs, competition and standard-setting: in search of a model address hold-up. *E.C.L.R.*, 33(9). pp. 388-389; and SATTler, Sven (2011). Standardisation under EU competition rules – the Commission’s new horizontal guidelines. *E.C.L.R.*, 32(7). p. 344.

⁴⁰ GERADIN, Damien (2013). The years of DG competition effort to provide Guidance on the application of competition rules to the licensing of standard-essential patent: Where do we stand? pp. 9-12. [online] Available from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2204359. Last accessed on 15 November 2013.

See also LANG, John Temple (2011). Patent pool and agreements on standard. *E.L.Rev.*, 36(6). pp. 889-890.

⁴¹ KOENIG, Christian and TRIAS, Ana (2010). Some standards for standardization: a basis for harmonization and efficiency maximization of EU and US antitrust control of the standard-setting process. *E.I.P.R.*, 32(7), pp. 329-331.

such patent.⁴² Once Nokia hold-up this patent against its competitors or other inventor, the will cause dramatic disadvantages to the latter's products. Hence, the discussion in this study assumes the precondition that only one standard exists in each technology in the market.

2.7. Licensing intellectual properties in the smartphone industry

Opportunistic firms are engaging in patent ambush with increasing frequency. It is suggested that SSOs need to formalise clear policy statements regarding relevant patents and patent application disclosure early in the formal standard development process.⁴³ One of these is that a unilateral disclosure of the maximum licensing terms may be required to eliminate patent hold-up.⁴⁴ The *ex ante* disclosure of enables licensees to envision what conditions may be applied if the patent becomes standard; it also allows SSOs to take into consideration the possible costs of standardisation. Also, the *ex ante* disclosure of most restrictive non-pricing terms can impede patent holders from imposing unfair obligations on certain licensees.⁴⁵ This suggested model makes sense and can help ease hold-up problems at a certain level. Nevertheless, it offers limited help if patent holders refuse to license their patent, or in some circumstances, SSOs and licensees may be misled into adopting the standardised patent because the patent holder is hiding the patent information. Moreover, if the SEP holder asks for fees or imposes obligation on licensees without complying with the disclosure it made, licensees may still have no choice but accept licensing terms if vast investment has been put into innovation. It seems likely that requiring a FRAND

⁴² Anonymous (2011). United States: intellectual property – patents. *C.T.L.R.*, 17(6), N144.

⁴³ LAYNE-FARRAR, Anne (2011). Assessing IPR disclosure within standard setting: An ICT case study. Accessed via SSRN 15 June 2013. pp. 3-6.

⁴⁴ TORTI, Valerio (2012). IPRs, competition and standard setting: in search of a model address hold-up. *E.C.L.R.*, 33(9), pp. 390-391.

⁴⁵ *Ibid.*

type of commitment is a more practical and flexible solution to exorbitant licensing terms in these cases.

To make patent accessible, many stress the merits of a voluntary patent agreement, such as patent pools and cross-licensing.⁴⁶ These are certainly ideal solutions to reducing the tension between patents and competitive benefits, yet it is doubtful if they can actually help to moderate the fierce patent war in the smartphone industry. The patent wars show that voluntary licensing is less possible in an industry where patents are used as a weapon to create profits. On other hand, many commentators support the view that compulsory licensing is an appropriate regime to mitigate the harm patents may cause to competition.⁴⁷ The smartphone industry is rife with strategic patents that are used to derogate rivals' competitiveness, and a compulsory license is a fair way to make an essential patent available to the market. Yet, it should be aware that the imposition of a compulsory license violates the patent holder's exclusivity. This study analyses current application and believes that any antitrust authority needs to avoid applying it before an appropriate standard is established.

2.8. Procedural problems under the current patent system

Products like smartphones, which consist of a dense assembly of patented works, are more likely to generate cross-border patent lawsuits because the components may be produced, manufactured, and sold in different regions.⁴⁸ This urges the need for a

⁴⁶ SHAPIRO, Carl (2001). Navigating the patent thicket: Cross-licenses, patent pools, and standard-setting. *Innovation Policy and Economy*, Volume 1. pp. 12-19.

See also LEMLEY, Mark A. and MELAMED, Douglas (2013). Missing the forest for the trolls. *Columbia Law Review*, Vol. 113. pp. 1013-1014.

⁴⁷ NG, Elizabeth Siew Kuan (2009). Patent trolling: innovation at risk. *E.I.P.R.*, 31(12). pp. 599-604.

⁴⁸ ROMANDINI, Roberto and KLICZNIK, Alexander (2013). The territoriality principle and transnational use of patented inventions – the wider reach of a unitary patented system and

harmonised global patent system, or at least, a certain level of coordination between patent authorities. It was criticised that being awarded a patent was a lengthy and expensive process at the best of times, and the inconsistent approaches used in different jurisdictions in the world intensify this problem.⁴⁹ The lately adopted enhanced European patent system which is believed can alleviate the uncertainty and high costs caused by divergent patent systems⁵⁰ and is regarded as a big step forward toward this goal in Europe with a unified patent courts.⁵¹ The unitary patent package in this regime including the regulations to enhance co-operation among participating states on the unitary patent issues and its translation arrangement; it also contains an international agreement on the unified patent court.⁵² Under this regime, the EPO is entrusted by 26 EU Member States (the “MSs”) to deliver and administer unitary patents although Spain and Italy have filed actions to challenge the language arrangement.⁵³

Yet, the smartphone industry is an emerging industry with many unforeseeable challenges; it is questionable that this system can facilitate improvement. In addition to the merits of the unitary patent system, this study will also mention the demerits, especially those that influence the smartphone industry.

the role of the CJEU. IIC, 44(5). pp. 527-529.

⁴⁹ DESCHAMPS, Carole (2011). Patenting computer-related inventions in the US and in Europe: the need for domestic and international legal harmony. *E.I.P.R.*, 33(2). pp. 106-107.

⁵⁰ KAZI, Ilya (2011). Will we ever see a single patent system covering the EU, let alone spanning the Atlantic or Pacific? *E.I.P.R.*, 33(8). pp. 538-541.

⁵¹ XENOS, Dimitris (2013). The European unified patent court: assessment and implication of the federalisation of the patent system in Europe. *Scripted*, Volume 10, Issue 2. p. 247.

⁵² EPC (2012). European Patent Office welcomes historic agreement on unitary patent. [Online] Available from: <http://www.epo.org/news-issues/news/2012/20121211.html>. Last accessed 29 September 2013.

⁵³ *Ibid.*

2.9. Conclusion

The aforementioned arguments and comments have indicated how the underlying problems with the current patent system may unduly expand patent protection and undermine the development of technology. Although they contribute to mitigating deep-rooted problems, these problems are not eradicated.

While many commentators emphasise certain types of issues, such as controversial computer-related innovation or innovative business methods, which is deemed unpatentable in some countries⁵⁴, this study does not seek to address whether it is reasonable to challenge this patent or not. Instead, it focuses on how to improve the patent system and embrace the idea of preserving the rights of these beneficiaries in contemporary society. Therefore, it considers all types of patents and observes how their application can influence this goal.

In doing so, this study starts by analysing the changes in society to determine if patents can influence the driving force of the current society. It moves on to explore the problems in the current patent system and how they can damage the information society with a special emphasis of the chaos of the current patent war. It then examines the countermeasures taken in legal practice and the market and discusses the extent of their usefulness, their insufficiency and the result it may cause. It concludes by answering the question of whether the current patent system is efficient or not, and suggesting the most urgent task at the current stage while proposing possible solutions derived from the discussion.

⁵⁴ DESCHAMPS, Carole (2011). Patenting computer-related inventions in the US and in Europe: the need for domestic and international legal harmony. *E.I.P.R.*, 33(2). pp. 108-114.

Chapter 3

How does patent law enhance the information society and communication technology?

3.1. The new economy and patent law

Different from the traditional industries that produce and sell physical goods, The technology industry has gradually been converted into an information-based mode. This reflects the fact that the value of most products and services in this industry is based on the information they deliver, including the "know-how" of information to invent manufacturing and operating products and services.⁵⁵ The circulation of such knowledge has grown in significance to lead the technology market into the era of the "knowledge economy".⁵⁶ In order to ensure that economic activities are lawful, intellectual property rights (hereafter "IP" rights) is one of the vital factors that influence the dissemination of knowledge and its cost.⁵⁷

3.1.1. Patent systems in the US and EU

3.1.1.1. US

US patent law is one of the laws that adopt these principles.⁵⁸ The US Congress is authorised by the US Constitution to provide a patent system to "promote the

⁵⁵ DEVLIN, Alan (2009). The stochastic relationship between patents and antitrust. *J.C.L. &E.*, 5(1), p 82.

⁵⁶ TIAN, George Yijun (2011). Competition law and IP abuse prevention in Australia: a comparative study. *W.I.P.O.J.*, 2(2), p 217.

⁵⁷ *Ibid.*

⁵⁸ Sections 102 and 103 the US Patent Act list the conditions of patentability, which reflect the principle of novelty and non-obviousness.

progress of science and useful arts" by securing inventors exclusive rights for a limited period.⁵⁹ Consequently, according to the wording of Section 101 of the US Patent Act, a patent can be awarded to "whoever discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof". US patents are examined and issued by the United States Patent and Trademark Office (the "USPTO") which was primarily established to support innovation in the US by granting patents to those who meet the patent requirements in patent law and practice.

Patent infringement can be brought to the federal district court under the US federal court system, and patent holders can be granted an injunction or ask for damages based on the verdict of the court.⁶⁰ It is worth noting that patent holders in the US can also choose to lodge a lawsuit with the International Trade Commission (hereafter the "ITC"), an agency responsible for providing an independent quality analysis, information, and "support on matters relating to tariffs and international trade and competitiveness."⁶¹ This also involves directing actions to cope with unfair trade, which includes patent infringement. Appellate cases involving patents from both the district court and the ITC are sent to the US Court of Appeals for the Federal Circuit, which has exclusive jurisdiction over such cases.

⁵⁹ Article 1, Section 8, paragraph 8 of the US Constitution.

⁶⁰ WILLIAMS, Fred I. and SAFIULLAH Rehan M. (2012). The smartphone patent wars: A US perspective. *The Licensing Journal*. June/July, p.18.

⁶¹ United States International Trade Commission. Mission Statement. [Online] Available from: http://www.usitc.gov/press_room/mission_statement.htm. Last accessed 13 November 2013.

3.1.1.2. EU

Elsewhere in the world, the EPC provides a simple definition of patentable inventions, namely that they are susceptible of industrial application, new, and involve an intensive step.⁶² There are currently two ways to acquire patent protection in Europe, one of which is to file a patent application with the competent national authorities that grant national patents in individual European countries, while the other is to be granted a European patent by filing a centralised patent application with the EPO in line with the requirements and procedure of the EPC.

What is confusing is that the European patent system is not a regime within the European Union. It is operated by the European Patent Organisation (hereafter the “EPOrg”), which is governed by the EPC but exists independently outside the EU. The states contracted to the EPC include 28 EU MSs States and 10 non-EU members.⁶³ Applicants can file a single patent application with the EPO to obtain a European Patent, but this patent is only valid in respect of the state in which it is granted.⁶⁴ Patentees who want to enforce their patent right have to validate the patent in the state in which they seek patent protection, since according to the EPC, the infringement of a European patent is dealt with by national law.⁶⁵ Therefore, European patents are normally regarded as being “a bundle of national patents.”⁶⁶

⁶² Article 52(1) of the EPC.

⁶³ Croatia was one of the non-EU contracting states of the EPC yet it joined the EU in July 2013.

⁶⁴ Article 64 (1) of the EPC.

⁶⁵ Article 64(3) of the EPC.

⁶⁶ PEERS, Steve (2011). The constitutional implication of the EU patent. *E.C.L. Review*, 7(2), pp. 203-231.

It is believed that the EU and the US have developed noteworthy regulations and policies to deal with the intricacy between IP law and competition law in the past two decades.⁶⁷ Moreover, US law is the forerunner in the world's intellectual property field, and EU institutes have global importance in terms of telecommunication standardisation because members come from various regions on earth, such as the US, Canada, Taiwan, Japan, Israel, Russia.⁶⁸ Therefore, this study is mainly directed toward the experienced legal systems of the EU and the US, which mainly represent the global trend on patent protection in the communication industry.

3.1.2. Patent and innovation incentives

It is assumed under the current patent system that innovation will be induced if patentees have the maximum liberty and leverage to use their inventions.⁶⁹ Since patents award patentees with the exclusive right to utilise their inventions and make a profit, the remuneration acquired from patent rights is a necessary incentive for further innovation.⁷⁰ It is undeniable that advanced technologies enhance the quality of life for the public's benefit, and inventive activity is the pathway to achieving this goal; however, some sceptics and economists doubt that it is possible to stimulate innovation in this way. Incentives and accessibility to innovations are both vital for inventive activities and an ineradicable difficulty is encountered when

⁶⁷ TIAN, George Yijun (2011). Competition law and IP abuse prevention in Australia: a comparative study. *W.I.P.O.J.*, 2(2), pp. 219-220.

⁶⁸ LAYNE-FARRAR, Anne (2011). Assessing IPR disclosure within standard setting: An ICT case study. At p. 5. Accessed via SSRN 15 June 2013.

⁶⁹ MANNE, Geoffrey A. and WRIGHT, Joshua D. (2009). Regulating innovation: Competition policy and patent law under uncertainty. *Lewis & Clark Law School Legal Research Paper Series*, Paper No. 2009-19, p. 29.

⁷⁰ *Ibid.*

attempting to strike a balance between them.⁷¹

The recent patent disputes hotly reported in the press reveal the extent to which patentees of such works rely on patent protection to secure their invention, while simultaneously demonstrating the tangled litigation and irregular decisions made on a worldwide scale.⁷² Many underlying impacts and sensitive issues of patents have emerged in this respect. In some circumstances, enforcing patents is not merely about rewarding hard work. With the exclusive power conferred by patents, holders can not only seek remuneration, but it is also possible for the patent to be a talisman to ensure their status when other similar products invade the market.

Unlike pharmaceutical inventions, which are fundamental to creating viable technological bases for least-developed countries and require flexible patent enforcement,⁷³ information and communication technology (hereafter the “ICT”) patents normally provide strong protection to patentees, which enable them to practice their patent in most cases. In this regard, an updated patent law to accommodate various new patterns of patent issues is one of the crucial factors to decide the progress of technology and the development and enjoyment this can bring to society.

⁷¹ LIIVAK, Oscar (2013). Establishing an Island of patent sanity. *Cornell Law School research paper* No. 13-06, p 13.

⁷² BUI, Jessica H. (2013). Apple vs. Samsung: smartphone patent war, practical implication and repercussions of Samsung verdict within the smartphone industry. pp. 12-18. [Online] Available from: <http://www.buigarcia.com/docs/Apple%20v%20Samsung.pdf>. Last accessed on 7 March 2014.

⁷³ Article 66 and Article 70 of the TRIPS Agreement.

3.2. Communication technology and the information society

3.2.1. Transition of society to a knowledge-based one

Physical resources have gradually lost their influence in the contemporary world, giving way to actionable knowledge, which may encompass information like data, images and symbols as the major social and economic support.⁷⁴ Information has become the key element to develop society, and while sociologists may have a different cognition of the knowledge society, they commonly believe that it is closely linked to technology and economic development.

The US sociologist, Bell, sensed that knowledge and information was replacing the industrial society in developed countries in the second half of the twentieth century and referred to this new social order as the post-industrial society.⁷⁵ He proposed his theory in the 1970s and influenced later social observations. Intellectual knowledge is the primary driving force of the post-industrial society and it even affects economic and political decisions. According to Bell's theory, the control and ownership of knowledge is the cornerstone of society.⁷⁶ Castells advanced a theory of a network society, in which the social structure is a capitalist one that operates around a network. This theory emphasised the close link between the economy, society and culture in the information age. He also defined the new economy as one in which corporations and similar forms of organisation in the world operate their businesses using the internet or the information technologies they utilise through it.⁷⁷

⁷⁴ WEBSTER, Frank (2004). *The information society reader*. 1st ed., London, Routledge. p. 31.

⁷⁵ HAUNSS, Sebastian (2013). *Conflicts in the knowledge society. The contentious politics of intellectual property*. 1st ed., Cambridge, Cambridge University Press. p. 59.

⁷⁶ *Supra.*, at pp. 60-61.

⁷⁷ WEBSTER, Frank (2004). *The information society reader*. 1st ed., London, Routledge., p. 150.

Productivity is one of the features of the new economy in Castells' network society and this relies on the application of knowledge and the practice of innovation; therefore, these are essential to increase productivity and enhance the economy. In the internet age, knowledge relates to ICT.⁷⁸ Competitiveness and networking are the other two important features of Castells' theory. Competitiveness represents globalisation because this new economy enables firms and even individuals and countries to create a market share and cooperate with others in an interdependent global environment. In an industrial society, networking reflects the same concept of large-scale standardisation and vertical organisations, but in the new economy, it is represented by the flexibility and adaptability of assembling resources within information technology. This networking feature enables the application of elements in the same network to different projects.⁷⁹ However, this feature generates a risk in that one firm can be easily edged out if it is not involved in the network, and one firm can eliminate others in the market through competition in the same way.⁸⁰ For example, a large corporation with vertical bureaucracy, which it proliferates throughout the world by means of competing, can make other organisations either transform into the network or disappear because of not being in line with the trend.

Castells' network society makes it clear that the contemporary society has been transformed from a material-based industrial society to an information society and the social economy has been driven to an informational, global, and networking trend. Another sociologist, Stehr, who proposed a theory of the knowledge society,

⁷⁸ *Ibid.*, at pp. 151-152.

⁷⁹ HAUNSS, Sebastian (2013). *Conflicts in the knowledge society. The contentious politics of intellectual property*. 1st ed., Cambridge, Cambridge University Press. p. 66.

⁸⁰ *Supra.*, note 65 at, p. 153.

reiterated the idea that the socio-economic base has been changed from material to monetary and is now symbolic. He made the salient point that knowledge has become an important political and social issue,⁸¹ which permeates society with its characteristic of being easy to transfer and replicate. Nonetheless, knowledge applied as information today is usually produced by intelligence as opposed to the way it just “happened” in other types of society in earlier times, and legislation is required to control the access and distribution of this valuable commodity.⁸² In this respect, Stehr’s knowledge society has led to attention being paid to social and political considerations of IP protection, which regulates the availability of knowledge. This illustrates the significance of protecting IP in this knowledge-based age by means of managing innovative activities and controlling the information distributed to society.

3.2.2. Mobile communication and the smartphone industry

A good information exchange network has become crucial to productivity and development as society has been propelled into the information era. Unlike traditional landline telecommunication, mobile phones not only enable people to communicate by means of a conversation or text message in a wireless environment, but their enhanced functionality also enables the use of other content and services via the internet. Handset devices have become smarter and more powerful with the advanced innovation of mobile technologies. They make it possible to connect to the World Wide Web and provide built-in or applied software, which has the capability of processing and disseminating a huge volume of data across boundaries.

⁸¹ HAUNSS, Sebastian (2013). *Conflicts in the knowledge society. The contentious politics of intellectual property*. 1st ed., Cambridge, Cambridge University Press, pp. 74-77.

⁸² *Ibid.*

Nevertheless, the problems that underlie the mobile phone industry are usually more complex. Due to the complexity of smartphone devices, a handset can be designed in A country, assembled in B country with the components from C, D, and more countries, and finally sold to dozens of regions throughout the world by an alliance of E and F countries.⁸³ The smartphone industry is an extremely lucrative business in this information society and it attracts a great many technology companies that devote time and money to inventing advanced functions, accessories, and software to respond to the demands of society, and of course, to make a profit. Furthermore, according to Castells' theory, network technologies can be applied in one project and re-organised to be applied in another. In other words, a patented technology in a network can also be applied in other network, which indicates that an invention today is actually based on many overlapping technologies. Therefore, while communication technology continues to progress and has a positive effect on society, it also increases the complexity of IP disputes.

3.3. Effect of the current patent system

3.3.1. Concept of exclusivity in patent law

The concept of patent protection can generally be determined from the patent rules, such as the wording in the TRIPS Agreement and the previously-mentioned EU and US patent regulations. The legislation is intended to promote creative activities by granting right holders the monopolistic right to their works.⁸⁴

⁸³ LIN, Rich and DONNER, Jonathan, 2009. Mobile communication. 1st ed., *polity press*, Cambridge. p. 129.

⁸⁴ CULLIS, Roger (2007). *Patents, inventions and the dynamics of innovation. A multidisciplinary study*. Edward Elgar Publishing, Inc., Cheltenham, pp. 135-136.

In fact, the exclusivity that accompanies a patent is not an absolute untrammelled right. Compared with copyright, with which the right holders enjoy a lifetime protection, the exclusive right granted by patent entitles right holders to monopolise their invention for a limited period of time, which is normally no more than 20 years. In addition, since patent law also requires right holders to disclose any useful arts, valuable knowledge can be accessed by inventors, researchers and manufacturers,⁸⁵ and bring advantages to consumers in the market and even the entire economy of country. This is why a patent is regarded as being a bargain for the ultimate benefits of society⁸⁶.

3.3.2. Potential problems with patents in the ICT industry

When considering the benefits derived from these inventions in ICT industry, it is easy to overlook the cost of implementing patent law and its impact on competition, which may have a negative effect on innovation in the long term. When patent protection allows patent holders more exclusivity to preclude competition than they actually need to stimulate innovation, it can lead to an increase in market prices and the cost of allocating research resources.

It is possible that a previous work may be a partial component of the later invention; in an industry in which technologies are highly fragmented, latecomers need to pay a large license fee for collecting the patents. An enormous amount of money is

⁸⁵ GIFFORD, Daniel J. and KUDRLE, Robert T (2011). Antitrust approaches to dynamically competitive industries in the United States and the European Union. *J.C.L. & E.*, 7(3), p. 710.

⁸⁶ DESCHAMPS, Carole (2011). Patenting computer-related inventions in the US and in Europe: the need for domestic and international legal harmony. *E.I.P.R.*, 33(2), p. 106.

invested in advanced products in the ICT industry,⁸⁷ and the mobile telecommunication sector is one example of this due to the stack of various patents in one device. Accordingly, abusing patent rights in this sector is not merely a matter of putting potential inventors off, but technology companies' hesitation to invest in better products also eventually hinders economic development.⁸⁸ Hence, the concern here is not only the substance of patent law, but also the way in which patent right holders apply the monopolistic right granted to them.

3.3.3. Abuse of dominant position

In Europe, the European Court of Justice (hereafter the “ECJ”), which is now the Court of Justice of the European Union (the “CJEU”), provided its observation of the “dominant position” in Article 82 of the EC Treaty⁸⁹, which was the prior provision to Article 102 of the Treaty on the Functioning of the European Union (hereafter the TFEU).⁹⁰ According to the court, a “dominant position” is a position of economic strength enjoyed by an entity, which “enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently” of its competitors, customers, and consumers. Further, in another case, the ECJ also expounded that IP right holders may be found to abuse their dominance position if they prevent the appearance of a new product by refusing a license without justification, and reserve the secondary market for themselves by excluding all the competition in the market.⁹¹ This is commonly known

⁸⁷ ZHANG, Liguó (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4). p. 384.

⁸⁸ TORTI, Valerio (2012). IPRs, competition and standard setting: in search of a model address hold-up. *E.C.L.R.*, 33(9). p.390.

⁸⁹ The Full name of the treaty was “Treaty establishing the European Community” which is renamed “Treaty on the Functioning of the European Union”.

⁹⁰ *United Brands Company v Commission* [1987] ECR 207, paragraph 65.

⁹¹ *Magill* [1995] E.C.R. 1-734. This description was originally applied to copyright, but it can

as the “exceptional circumstances test”⁹². (See Chapter 5 for more discussion)

In the US, one of the antitrust regulations is recorded in Title 15 of the US Code, which is also known as the Sherman Act. The provisions of this Act do not include the idea of “dominance”; rather, they stipulate that it is an offence to engage in or attempt to engage in monopolistic activities.⁹³ An early US case concluded that a monopoly offence had two key elements, namely “the possession of monopoly power in the relevant market” and “the willful acquisition or maintenance of power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident.”⁹⁴

The competition systems of both the EU and the US have the shared goal of advancing consumers’ interests, securing the circulation of goods, and ultimately securing consumers’ freedom of choice and protecting providers’ freedom to access a competitive market. Nevertheless, there are differences in practice when applying these competition laws. The provision of the TFEU prohibits undertakings that abuse exclusivity; in other words, it targets those who already have a dominant position, but does not forbid the conduct whereby entities can obtain dominant power. Based on the stipulation, Article 102 of the TFEU is only applicable if undertakings, the IP right holder, refuse to grant a license or impose unreasonable licensing conditions, such as excessive licensing fees. On the other hand, the US Sherman Act prohibits those who already monopolise, attempt to monopolise, and those who cooperate or

also be valuable in patent cases.

⁹² TOTH, Andras (2008). Protection of investments in European abuse of dominance cases. *E.C.L.R.*, 29(12), p. 712.

⁹³ Section 2, Title 15 USC.

⁹⁴ *United States v. Grinnell Corp* 384 U.S. 563 (1996), p. 571.

conspire with any person to monopolise trade or commerce. In addition, the Act does not only apply to entities that constitute a monopoly, but the provision also applies to person/persons who engage in monopolistic conduct.⁹⁵

The aforementioned competition-related provisions reveal that IP right abuse issues are normally regulated by competition laws or policies, at least in developed countries like the US and most European nations. However, it is evident that there is not yet a global consensus on competition policies; indeed, international treaties like the TRIPS Agreement merely establish a principle on preventing the abuse of the IP rights of their members⁹⁶; but it relies on member nations to create specific rules for such issues.⁹⁷

3.3.4. Patent trolls

The lack of guidance to right holders in patent law is criticised by commentators who propose that IP law should form a more disciplined concept of IP injury to present a clearer picture of patent exclusivity and remedy.⁹⁸ Patent law only requires right holders to disclose information about the inventions; they are not obliged to engage in a technological exchange under the law.⁹⁹ Namely, patent law focuses on the aim of incentivising innovation; the friction in the market is not a concern of the current patent system.

⁹⁵ SCHREPEL, Thibault (2013). Patent troll through US and EU antitrust law: when co-operation is no longer an option. *E.C.L.R.*, 34(6), p. 324.

⁹⁶ Article 8(2) of the TRIPS Agreement.

⁹⁷ TIAN, George Yijun (2011). Competition law and IP abuse prevention in Australia: a comparative study. *W.I.P.O.J.*, 2(2), p. 219.

⁹⁸ LIIVAK, Oscar (2013). Establishing an island of patent sanity. *Cornell Law School research paper No. 13-06*, pp. 13 - 14.

⁹⁹ *Supra.*, p. 15.

To continue the above analysis, it seems that this contrarily contravenes the idea of a patent as being granted to promote the progress of useful art; instead, it allows the inventors to patent every little piece of a new creation, even if it is negligible and hardly assists the development of technology. On the other hand, it is also possible that speculators may purchase useful inventions or patents from right holders and license them to those who need to access the invention. Both of these patent holders have one thing in common. Rather than obtaining patents in order to exploit and develop useful inventions in the market, they do so to make a profit from the huge gap between the cost of obtaining the patent and the advantages after they assert patent infringement from others who have to refer to it. They are called patent trolls.¹⁰⁰

Patent trolls usually target technology firms, especially those that are unaware they have infringed the patent and then threaten to file litigation. Since these patent holders do not create new technologies or refine existing works, but rather increase the difficulty for inventors to access necessary patents, this results in unfavourable consequences to the patent system and even harms the information society¹⁰¹.

(“Patent trolls in the thickets environment” will be discussed in Chapter 4)

3.3.5. Patent hold-up and patent ambush in the smartphone industry

Apart from patent trolls, who take advantage of the shortcomings of patent law, patent hold-up is another problem. As shown by the brief definition in the earlier

¹⁰⁰ YEH, Brian T. (2013). An overview of the “patent trolls” debate. *CRS Report of Congress*, pp. 4-5.

¹⁰¹ NG, Elizabeth Siew Kuan (2009). Patent trolling: innovation at risk. *E.I.P.R.*, 31(12), pp. 596 - 597.

section, patent holders' competitors may be unable to enter the market because they cannot apply the essential creation; thus, they are blocked from selling their products and suffer great losses. Motorola was found misusing its SEPs by European Commission related to mobile and wireless communications just few months ago for the reason that it hold-up the SEPs and sought for injunction relief against Apple.¹⁰²

A similar trick worth mentioning at this stage is patent ambush, which may also occur in the business world under the current patent system. Patent holders may quietly wait for an infringement of their works and then demand an exorbitant price when someone accidentally utilises their patent, which constitutes patent infringement. This is a tactical strategy, particularly during the standardisation of patent works.¹⁰³ More specifically, patent ambush occurs when an entity invests a great deal of effort and money in a product and unconsciously violates the right holder's patent, especially when trying to implement an essential standard technology in the industry. The famous *Rambus* case is an example of this in which the SEP holder concealed patent information during standardising process and asked ETSI members to pay unreasonable fees after its patent was adopted as standard.¹⁰⁴ In these cases, the infringer may tend to pay the royalty as long as it is lower than or equal to the cost of transferring to an alternative technology.¹⁰⁵

¹⁰² European Commission (2014). Antitrust: Commission finds that Motorola Mobility infringed EU competition rules by missing standard essential patents. [online] Available from: http://europa.eu/rapid/press-release_IP-14-489_en.htm. Last accessed on 20 June 2014.

¹⁰³ CHRONOPOULOS, Apostolos (2009). Patent Standards – a case for US antitrust law or a call for recognising imminent public policy limitations to the exploitation rights conferred by the Patent Act? *ICC*, 40(7), pp. 782 – 783.

¹⁰⁴ European Commission, COMP/38.636, December 9, 2009. The *Rambus* case will be discussed in detail in Chapter 6.

¹⁰⁵ ZHANG, Liguang (2010). Refusal to license intellectual property rights under Article 82 EC in the context of standardisation. *E.I.P.R.*, 32(8), p. 404.

The aforementioned problems have been observed in patents granted for telecommunication technology in the past decade, when the main disputes have involved mobile telephony components. It is worth considering why patents are so important in the smartphone industry.

Samsung, which is the one of the famous mobile handset providers, has asserted patent infringement against other providers and sought for injunctive relief in pools various MSs in the EU¹⁰⁶. These patents are essential to the industry standard and Samsung has made an irrevocable commitment to license them under FRAND terms to ETSI members. The European Commission initiated a formal proceeding against it in January 2012 and began to investigate whether or not Samsung had failed to honour its commitment, was abusing its dominant position, and hence distorting competition in the market¹⁰⁷. The Commission believed that Apple, the defendant, was willing to license, yet was not able to do so. (Case analysed in Chapter 4)

The Commission's investigation against Samsung is a good example of a firm holding up a standardised patent makes it even more possible to constitute the abuse of a dominant position under the TFEU because the patent holder may obtain market power and obstruct the implementation of its patent¹⁰⁸. When Samsung's 3G and wireless technologies become the standards in the market, its rivals will have no

¹⁰⁶ ROTONDO, Elisabetta (2012). European Commission initiates proceedings against Samsung for abuse of dominance by failing to license its standard-essential patents on fair, reasonable and non-discriminatory terms. *E.C.L.R.*, 33(8), p. 347.

¹⁰⁷ European Commission (Press release), 2012. Antitrust: Commission opens proceedings against Samsung. Available at: http://europa.eu/rapid/press-release_IP-12-89_en.htm?locale=en. Last accessed on 30 March 2014.

¹⁰⁸ TORTI, Valerio (2012). IPRs, competition and standard setting: in search of a model address hold-up. *E.C.L.R.*, 33(9), p. 387.

option but to refer to its patents to make their products acceptable in the same market. It is not hard to imagine that Samsung will exert its patent rights on other smartphone providers and charge excessive fees, or even refuse to license the implementation of its patents. As a result, the company that owns the essential patents becomes the sole provider and is able to control the quality and price of such smartphone devices.

3.4. Brief conclusion

It is certainly true that not all the patent litigation filed in a competitive market is an abuse of patents. Patents allow holders to maintain their legitimate rights by enforcing them. Asserting patent against competitors is a legal way to carry out the protection associated with a patent. Since the need to protect IP is derived from the fact that such creations require a high input of intelligence but can be reproduced for a low cost, the legal monopoly is granted to right holders based on their need to recover their investment and to secure them from the disadvantages of market failure.¹⁰⁹ Therefore, the appropriate exercise of IP rights enables inventors, individuals or companies to profit from their creative work, and this stimulates their desire to engage in further creative activities.¹¹⁰

However, it is well-known that Apple and Samsung, the major companies in the smartphone market, had launched more than 50 patent litigations against each other in 10 countries across the US, Europe, Asia and Australia by 2012.¹¹¹ Regardless of

¹⁰⁹ TOTH, Andras (2008). Protection of investments in European abuse of dominance cases. *E.C.L.R.*, 29(12), pp. 710 - 711.

¹¹⁰ TORTI, Valerio (2012). IPRs, competition and standard-setting: in search of a model address hold-up. *E.C.L.R.*, 33(9), p. 387.

¹¹¹ Foss Patents (2012). List of 50 plus Apple-Samsung lawsuits in 10 countries. [Online] Available from:

these lawsuits being lodged to protect the patentee's legitimate right or to restrain competitors' business, the current patent system has shown its risk of increasing the number of patent suits. The smartphone industry is an emerging industry and one that is rife with innovation. Due to the incremental and fragmented nature of this industry, the current patent system fosters an environment in which patentees can hamstring competitors by asserting infringement. Moreover, the ambiguous patent scope issued under the system also attracts more infringement because infringers can easily challenge the validity of the patents.¹¹²

Such a litigious environment will undermine the opportunity to further advance technology because, even if inventors have valuable ideas, they may hesitate to take the risk of being sued. In the end, this will create obstacles to technological research regardless of whether its purpose is to make a profit or not and increase the difficulty of the creative process, as well as delaying the move from existing products to those imbued with next-generation technology.¹¹³ Innovators may not be able to afford the high cost of searching for resources and patent litigation under the current patent law. On the contrary, companies that can afford to do so are utilising the majority of their capacities and resources for competitive purposes rather than R&D. Although it is not certain that patent effectively promote innovation by minimising patentees' risk of being utilised without authorisation, it appears that the patent system leads to

<http://www.fosspatents.com/search?updated-min=2014-01-01T00:00:00%2B01:00&update-d-max=2015-01-01T00:00:00%2B01:00&max-results=50>. Last accessed on 3 April 2014.

¹¹² POSNER, Richard (2012). Do patent and copyright law restrict competition and creativity excessively? [Online] Available from:

<http://www.becker-posner-blog.com/2012/09/do-patent-and-copyright-law-restrict-competition-and-creativity-excessively-posner.html>. Last accessed on 7 April 2014. (The author is he Judge of the United States Court of Appeals for the Seventh Circuit)

¹¹³ Shaver, Lea (2012). Illuminating innovation: from patent racing to patent war. *Wash. & Lee L. Rev.*, 69. p. 57.

Chapter 4

Examples and Problems

4.1. Introduction

This chapter examines the current status of patent system and the way in which it is implemented in practice before identifying the problems derived from patent cases in different territories.

The patent dispute between Apple and Google's Android operating system-based mobiles and the famous patent troll case in smartphone handset industry and relevant information communication technology will be taken as the main example to reflect and identify the omissions in the patent system and ascertain the way in which it is connected to competition rules. The doubts raised in this chapter will be analysed in subsequent chapters.

4.2. Patent types and case laws as examples

Mobile phone manufacturers and their software providers are not only established in developed countries; Samsung, the South Korean technological giant, is an outstanding example of a successful smartphone company located outside developed territories. However, statistics show that thirty-nine percent of worldwide smartphone sales in 2013 were by companies without a high market share, while the top five best-selling smartphone providers had more than sixty percent of market share.¹¹⁴ Some device providers may not be as well-known as those embroiled in the

¹¹⁴ GARTNER (2014). Garner says annual smartphone sales surpassed sales of feature phones for the first time in 2013. [Online] Available from:

recent patent war, but their products still have a market share in the domestic market of their specific countries. It may also be necessary for their products to refer to others' patents to meet the public demand, and this is another reason to believe that patents in relation to smartphones and communication technologies are a worldwide issue.

Before identifying the inefficiency of patent system in competition market, it is worth exploring how the current patent system within the smartphone handset and telecommunication technology industry works; in other words, how technology companies put their patent rights into practice and how this affects the industry's competitive market.

4.3. Types of patent in the smartphone industry

4.3.1. Background

Patent consciousness has been elevated in the industry and an increasing number of patent applications are being filed in patent offices. This consciousness also results in more patent lawsuits being filed in the courts.¹¹⁵ There are numerous examples of patent litigation by well-known companies such as Apple, Microsoft, Motorola Mobility, Samsung, and so on.¹¹⁶ Due to the highly sophisticated components and software in a handset and the rapid industrial progress of advanced functions, most of these cases have several common grounds, one of which is that the companies

<http://www.gartner.com/newsroom/id/2665715>. Last accessed on 20 April 2014.

Different from smartphones, the so-called feature phones refer to the mobile phones which have limited or no ability to support web access and to run third-party applications.

¹¹⁵ CARRIER, Michael A (2012). A roadmap to the smartphone patent wars and FRAND licensing. *CPI Antitrust Chronicle*, (2), p. 2.

¹¹⁶ *Ibid.*

hold a massive number of patents; for instance, Apple's famous product, the iPhone, has more than 200 patents, and as a result, Apple is the sole supplier of its specific patented techniques and devices.¹¹⁷ Another common ground is that these companies seek to take legal action when competitors apply their patents or impose unreasonable licensing obligations on them rather than create patent pool and share patents.¹¹⁸

In terms of mobile handsets, conventional mobile phones are mainly manufactured for basic communication purposes, such as making and receiving phone calls. Since providers of such devices normally focus on developing the hardware and wireless communication technologies, they own patent portfolios related to telecommunication operating techniques, some of which are established as standard technologies in the industry. Long-developed device manufacturers like Nokia and Motorola have a significant influence on the market share in the mobile phone market.¹¹⁹

Motorola is a good example of this, since its portfolio includes a large number of patents related to wireless communication hardware, although it was purchased by Google in 2011. Some of its patents are even adopted as standards in the field of 3G (a standardised network support service for the transfer of information) and 4G (an enhanced service of the 3G standard, which provides mobile ultra-broadband

¹¹⁷ COX, M.B. (2012). Apple's exclusive distribution agreements: a refusal to supply? *E.C.L.R.*, 33(1). P.15.

¹¹⁸ An example can be seen that Samsung filed lots of patent litigation regarding its SEPs in the EU although some of the alleged infringers like Apple had tried to negotiate patent licensing with Samsung. More details of European Commission's antitrust investigation on this will be discussed in Section 4.3.2.1..

¹¹⁹ HOYLE, Ben (2013). Apple v Samsung: lessons from a global intellectual property war. *C.T.L.R.*, 19(4), p. 63.

internet access) technologies in telecommunications.¹²⁰ On the other hand, Nokia, confronted Apple with an infringement lawsuit because Apple used its patents on phone cameras, power management, and other mobile phone applications;¹²¹ besides, its patents regarding 2G (Global System for Mobile Communications)¹²² and 3G communications were also adapted as SEPs to telecommunication technology, which is essential as follow-up mobile phone development.

The first indication of the concept of smart phones initially appeared at the beginning of this century, when some computer characteristics were added to conventional mobile phones, and they were able to connect to internet; thus, they were capable of being a personal digital assistant, a web browser and a provider of email services.¹²³ Ever since the success of 2G network in Europe, which then expanded outside Europe, mobile communication technologies have continued to be enhanced and have moved on to advanced networks. The 3G network enables internet connection on a handset and seamless global roaming, which thus boosts the speed of communication and diversifies communication services. The communication network has now progressed to a 4G system, which makes services available anytime, anywhere and provides a greater rate of data.¹²⁴

¹²⁰ HOEHN Thomas and LEWIS Alex (2013). Interoperability remedies, FRAND licensing and innovation: a review of recent case law. *E.C.L.R.*, 34(2), p 110.

¹²¹ Anonymous (2011). United States: intellectual property – patents. *C.T.L.R.*, 17(6), p.144.

¹²² ZHANG, Ligu (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), p.380.

¹²³ WILLIAMS, Fred I. and SAFIULLAH, Rehan M. (2012). The smartphone patent wars: A US perspective. *The Licensing Journal*. June/July, p.16.

¹²⁴ ZHANG, Ligu (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), 383.

The telecommunication network is not the only means by which smartphones have been enhanced. With the production of more advanced features, smartphones are now equipped with high-definition built-in cameras and voice recorders and even the ability to download data. Apart from the functional improvements, the mobile telephone evolution could also be seen by the appearance and usage-pattern of the phone. A touchscreen keypad became the mainstream instead of the traditional keyboard input and more convenient operational modes, like slide-to-unlock and pinch-to-zoom, were introduced based on this technology. Mobile phone manufacturers began to attract consumers' attention by focusing their efforts on the user interface.¹²⁵

Moreover, another characteristic of smartphones is the variety of software available for application, which allows them to provide services such as maps, users' global position system, entertainment, social networking, and even intelligent assistance. However, booting an application programme, whether a built-in or added app, relies on the operating system of the mobile device. Although each operating system on the market may only have a marginal level of different software organisation or operating procedures, many legal actions have been launched in the recent patent war between the systems of the famous Apple iOS and Google's Android. This feature is one of the decisive factors when customers are choosing a smartphone handset; it may also cause competition concerns because providers have to ensure that they can support regular, attractive and distinctive software to increase their market share.

¹²⁵ HOYLE, Ben (2013). Apple v Samsung: lessons from a global intellectual property war. *C.T.L.R.*, 19(4), p. 63.

4.3.2. Formidable opponents and chaotic results

Ever since the first smartphone was introduced, the heady pace and number of patent disputes filed on different continents have become too rapid and widespread to be comprehensively followed. In the light of the observations in last section, a smartphone device contains different types of patents that can be roughly categorised as communication networks, including wireless technologies; the design of in-house hardware and the user interface; and application software and operating systems. A series of cases, although not exhaustive, is discussed in this section in order to reflect the problems caused by the overflow of litigation and the damage likely to be caused to the information society.

These examples are chosen because they clearly reflect the underlying damage on the development of each categorised technology. The main issues of concern in this study include patent validity, FRAND licensing, and patent assertion entities, and an overall observation is given in the next section.

4.3.2.1. Communication network patents

The Hague District Court in the Netherlands refused an injunction request on a SEP in 2011 when Samsung asked for an injunction to restrain Apple from applying its 3G/Universal Mobile Telecommunication System standard.¹²⁶ One of the reasons made by the Court is that Samsung was obliged to license its SEP to Apple as it made a FRAND commitment. Moreover, based on the principle of exhaustion, Apple's

¹²⁶ D.C. Hague, Mar. 14, 2012, Dkt. Nos. 400367/HA ZA 11-2212, 400376/HA ZA 11-2213, 400385 / HA ZA 11-2215 (Samsung Elecs. Co. Ltd/Apple Inc.) Cited from GREENFIELD, Leon B. et al. (2013). SEP enforcement Disputes beyond the water's edge: A survey of recent non-U.S. decisions. *Antitrust*, vol. 27, No. 3. pp. 51-52.

purchase of SEP work from Qualcomm made it licensed by extension; Samsung's termination of its license to Qualcomm did not impact Apple because it had made a commitment to SSOs to grant irrevocable licenses on the SEP.

Similarly, Samsung requested an interim measure against Apple's sale of the iPhone 4S in Italy, claiming that the operation of the iPhone 4S 3G system infringed Samsung's patents.¹²⁷ However, Samsung's request was rejected by the Tribunal of Milan in Italy in early 2012 due to doubt of the validity of its patent and whether it was eligible to be a standard.¹²⁸ In this case, the Tribunal denied Apple's claim that Samsung had abused its dominant position based on the fact that the two parties had actually negotiated the licensing of the given patent. Moreover, the Court proposed meaningful principles to determine the reasonable royalties of a patent in order not to constitute the abuse of a dominant position. Accordingly, patent holders should be able to determine the royalties of their patent if it does not restrict the licensee's activities, and as long as the royalties are not discriminatory compared to other licensees.¹²⁹

The European Commission noted that, in 2011, Samsung claimed various patent infringements of its SEPs against its competitors in the smartphone market and sought injunctive relief in many MSs. It was suspected that Samsung was attempting to protect its dominant position by seeking injunctions. Therefore, the Commission opened an antitrust proceeding in Brussels in January 2012 to investigate whether or not Samsung had distorted the competition in the European mobile devices market

¹²⁷ *Samsung Electronics Co Ltd v Apple Inc.* Unreported January 5, 2012 (Trib (Milano)).

¹²⁸ SIRAGUSA, Mario (2012). Italy: Tribunal of Milan – Samsung v Apple, January 5, 2012. *G.C.L.R.*, 5(3), pp. R 32-R33.

¹²⁹ *Ibid.* at p. 32.

and breached the EU's anticompetitive rules.¹³⁰ However, it is assumed that the Commission is likely to close the investigation without further action based on two signs, one of which is that the US Antitrust Division in the DOJ closed a similar investigation against Samsung in February 2014 in which it closely worked with and consulted its colleagues at the European Commission.¹³¹ The other is that the Commission received a proposal from Samsung in October 2013 which stated that it would no longer seek a ban on its competitors by asserting its SEPs if they were willing to acquire the license for smartphones and tablets with fair terms in the following five years.¹³²

This again reflects the antitrust concern on the negative impact of overflowing patent litigations and the inevitable combination of patent law and competition law. Samsung, which is one of the most influential enterprises in the telecommunications industry, owns many patents related to wireless communications, and since it is committed to the ETSI, its SEP should be made available to the public under FRAND terms unless there is any objective justification.¹³³

¹³⁰ Available online from http://europa.eu/rapid/press-release_IP-12-89_en.htm. Last accessed 3 June 2013.

¹³¹ The United States Department of Justice (2014). Statement of the Department of Justice Antitrust Division on its decision to close its investigation of Samsung's use of its standards-essential patents. [Online] Available from: <http://www.justice.gov/opa/pr/2014/February/14-at-129.html>. Last accessed on 21 April 2014. Although the anticompetitive provisions are not complete the same in the EU and US, the DOJ indicated that "the cooperation underscores the agencies' common concerns over the potential harm to competition that can result from the anticompetitive use of SEPs."

¹³² GILBERT, David (2014). Almunia: EU antitrust investigation into Samsung patent abuse to end this April. *International Business Times*. [Online] Available from: <http://www.ibtimes.co.uk/almunia-eu-antitrust-investigation-into-samsung-patent-abuse-ended-this-april-1435552>. Last accessed on 21 April 2014.

¹³³ ROTONDO, Elisabetta (2012). European Commission initiates proceedings against Samsung for abuse of dominance by failing to license its standard-essential patents on fair, reasonable and non-discriminatory terms. *E.C.L.R.*, 33(8), p. 347.

4.3.2.2. Design of in-house hardware and user interface

Before beginning to discuss this kind of patent, it is necessary to clarify that, although this study mainly focuses on the patent protection of technical devices and software of products, a reasonable amount of attention is given to registered design, since this is inseparable from some patent disputes in the patent war in some cases. Apple is a conspicuous example of a firm that makes good use of its design and blocks its competitors' business opportunities via patent allegation. An example is given that Apple was successful in the US when it asserted that Samsung had used a design of one of its icons on its operating system. However, it failed in courts in countries like South Korea and the UK, where the judges tended to construe the protection of design narrowly.¹³⁴

"Design" refers to the registered rights that may be simultaneously asserted in some patent cases because of their close connection to a patented work.¹³⁵ A registered design, known as a design patent in the US, is a kind of IP right that mainly protects the overall visual appearance of the whole or part of a product.¹³⁶ In other words, while patents protect the functionality of a product, registered design protects its ornamental non-functionality appearance. It is common for a smartphone company to lodge a prosecution for the patent and design infringement of the same product. Different from telecommunication technology patents, which are normally the core of technology and essential to mobile phone production and practice, patents for

¹³⁴ HOYLE, Ben (2013). Apple vs. Samsung: lessons from a global intellectual property war. *C.T.L.R.*, 19(4), p. 64.

¹³⁵ *Ibid.*, at p. 63.

¹³⁶ The legal definition of registered design can be found in article 25 (1) of the TRIPS Agreement, section 2 of the Designs Act 1953 in the US and section 1(2) of the Registered Design Act 1949 in the UK.

user interfaces are usually related to registered design. With regard to in-house hardware, it is can be a subject patent; yet it can also be a subject of registered design, such as Apple's bespoke system-on-chip design.¹³⁷

In practice, user interface issues appear to be more common than in-house hardware disputes. The US District Court made a ruling in August 2012 based on the decision of the federal court jury,¹³⁸ when it presented the verdict that Samsung had infringed Apple's patents on a bounce-back technique, pinch-to-zoom, and the design of the iPhone. The jury judged that Samsung knew or should have known that it was infringing Apple's patents. Samsung had filed a countersuit claiming that Apple infringed its patents related to wireless communications and camera phones. However, it was believed that the Korean company had breached US antitrust laws because it was trying to monopolise the wireless market by holding the relevant patents, and the court ruled in favour of Apple's assertion for these reasons. Samsung lost this case and compensated Apple with almost 1.05 billion dollars for its violation of Apple's patents on smartphones and tablets.

The verdict in this case did not only represent a financial loss for Samsung; in fact, the amount of patent infringement compensation was only a tiny part of Samsung's annual revenue.¹³⁹ However, this verdict undoubtedly had an earth-shaking impact on the business. As far as Samsung, the losing party, was concerned, the verdict not only resulted in the removal of the products that had applied the said patents, but

¹³⁷ HOYLE, Ben (2013). Apple v Samsung: lessons from a global intellectual property war. *C.T.L.R.*, 19(2). p.64.

¹³⁸ TOTHILL, John (2012). The mobile phone patent wars. *C.T.L.R.*, 18(4), p. 95.

¹³⁹ LOVE, Brian J. (2012). Past unlawful injunctions shouldn't cloud Samsung Galaxy S III's future. *TechCrunch*. Access via SSRN on 1 May 2013.

also made it more difficult to innovate future products because its future investment costs will be increased since it will have to evade Apple's patent or pay to use it. Furthermore, the verdict may make consumers have less confidence on Samsung and it may impact the sale of Samsung's products.

On the other hand, Apple once lost the case it asserted against HTC in the UK in July 2012, in which the UK's High Court ruled that HTC had not infringed Apple's four patents. However, this case was lodged to enter an appeal and part of the asserted patents related to the invalidation of a computer device with touch-sensitive screens which handled the multi-touch function of Apple's product, was allowed.¹⁴⁰

The Court of Appeal held that the Judge in the Patent Court rightly applied the reason of obviousness to deny the patentability of the claim on a handling method of "multi-touch at a time." However, it stated that the Judge in the Patent Court wrongly denied the patentability of an added feature for the method for the same reason.¹⁴¹ Apple's patent related to computer programmes and thus is not excluded from patentability in the EPC and the UK Patent Act.¹⁴² It recognised that a judge had erred when inspecting whether or not the asserted patent fell within computer software and was excluded from patentability. It emphasised the technical contribution to the basic internal operation of a device and having a new and improved effect on the product. Using a computer programme to implement the device was found not to render the device unpatentable. Apple's appeal on this claim was thus allowed.

¹⁴⁰ *HTC Europe Co Ltd v Apple Inc* [2013] EWCA Civ 451.

¹⁴¹ Paragraph 91, [2013] EWCA Civ 451.

¹⁴² Section (2)(c), article 52 of the EPC; Section 1(2) of the Patent Act 1977.

4.3.2.3. Application software and operating system

The operating system is the basic software of a smartphone device. It contains a collection of software to manage the device's hardware and provide services for the application programmes. It is the core component that supports the operation of the smartphone, with the function to support the mobile phone, development environment, power management and multimedia capabilities.¹⁴³ The operating system classified in this category mainly concerns its substantial function in the system.

The most prevalent operating system is Google's Android platform which had more than a seventy-eight percent market share in worldwide smartphone operating system market in 2013 and the second biggest market sharer, Apple's iOS system, had nearly sixteen percent, whereas the remaining operating systems combined only had six percent of market share.¹⁴⁴

It is true that most operating system providers are capable of developing distinctive software to attract consumers. However, in some circumstances software patent holders are individuals or small and medium enterprises (hereafter "SMEs"). They may choose to license popular operating systems to obtain the best royalty rates, which causes competition concerns because consumers will choose the operating

¹⁴³ DAPONTE, P. et al. (2013). States of the art and future development of measurement applications on smartphones. *Measurement*, 46, p. 3298.

¹⁴⁴ GARTNER (2014). Garner says annual smartphone sales surpassed sales of feature phones for the first time in 2013. [Online] Available from: <http://www.gartner.com/newsroom/id/2665715>. Last accessed on 20 April 2014.

system that can support more software operations. Moreover, smartphone providers may also choose to employ such operating systems to elevate their handsets sales. Operating systems with smaller market shares may be gradually eliminated and only those with a high market share can survive. Yet, this scenario is not the only possibility in the smartphone market. When other operating system providers introduce more fascinating software, the patent holder can ensure its dominance by attracting consumers to choose its system. As a result, software patent competition may encourage market participants to innovate. This is advantageous to the smartphone industry and gives the public a variety of choices.

Nevertheless, compared to the fierce battle over user interface design and operating methods, application software seems to be a less attractive subject for assertion in patent litigation. This phenomenon can be ascribed to the fact that the alleged infringers are usually apps developers, who are less influential than operating system vendors and device makers in the smartphone market. In fact, apps developers are normally small entities or individuals. These developers would find it hard to defend a lawsuit unless a well-developed company is behind the app or their app is widely accepted and circulated in the business.¹⁴⁵ It is more likely that they will compromise and thus become an easy target to patent assertion entities to threaten patent infringement and demand fees for incomes.

Several lawsuits were filed in the US against small apps developers rather than the major companies in the industry. Lodsys alleged that the apps provided to Apple's

¹⁴⁵ MULLER, Florian (2011). New smartphone suit also targets app developers: H-W Technology sues 32 parties. [Online] Available from <http://www.fosspatents.com/2011/03/new-smartphone-patent-suit-also-targets.html>. Last accessed 10 November 2013.

The patent concerned the methods and systems for gathering information that enable consumers to purchase online via the app's software.¹⁴⁷ Moreover, another patent-holding company in the US, MarcoSolve, launched a legal action against small app developers by asserting its patent on system and method for data management.¹⁴⁸ MarcoSolve targeted the developers of the two major operating systems; therefore, developers' apps, which inevitably collect information online or in smartphones and evaluate and send data over the internet, can easily constitute patent infringement.¹⁴⁹ It is believed that MarcoSolve targeted the developers based on the consideration that there was no sign that they would intervene in such litigation or petition for re-examination.¹⁵⁰ This verifies the aforementioned reason of why individuals and small entities are targeted.

¹⁴⁶ SHURKIN, Joel (2011). Fighting patent 'trolls' – there's no app for that. *New Scientist*, 210, 2817, p. 26.

¹⁴⁸ US Patent No. 7822816. Available from
<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=7,822,816.PN.&OS=PN/7,822,816&RS=PN/7,822,816>.

¹⁵⁰ GOPAKUMAR, Anoop (2011). Angry bird attacked – Mobile app developers targeted in patent litigation. [Online] Available from: <http://wiki.piug.org/display/PIUG/2011/09/06/Angry+Bird+Attacked+-+Mobile+App+Develo> pers+Targeted+In+Patent+Litigation. Last accessed on 21 April 2014.

purchased from another individual.¹⁵¹ With regard to MarcoSolve, it may actually engage in the creation of apps, but it is notorious for filing patent lawsuits without warning the defendant parties. Indeed, patents award holders the right to prevent unauthorised third parties from making, using, and selling their work. MarcoSolve's behaviour is the lawful exercise of a patent. Yet, it does not commercialise its patent; rather, it had filed over seventy-five lawsuits in the eastern district of Texas by early 2014¹⁵² as the Eastern District of Texas is regarded as the playing field for patent trolls.¹⁵³ Plaintiff's wins patent litigation against companies easily here thus defendants normally choose to settle.

In March 2014, a coalition of MarcoSolve's defendants fought back by banding together, and stopped paying. MarcoSolve finally dismissed all the remaining cases.¹⁵⁴ This was a victory for genuine innovators who actually engage in R&D. However, application software is often accused of patent infringement in the US, as illustrated by these cases. This is assumed to be because patent examination is relatively flexible in the USPTO than the patent offices in European countries; therefore, patents are easily deemed to be valid in the US court and patentees can enjoy the rights that accompany patents.¹⁵⁵ This is certainly a disadvantage to other

¹⁵¹ SHURKIN, Joel (2011). Fighting patent 'trolls' – there's no app for that. *New Scientist*, 210, 2817, p. 26.

¹⁵² MASNICK, Mike (2014). Newegg gets patent troll Marcosolve to "fold like a cheap suit". [Online] Available from: <https://www.techdirt.com/articles/20140402/14293426778/newegg-gets-patent-troll-macosolve-to-fold-like-cheap-suit.shtml>. Last accessed 24 April 2014.

¹⁵³ PATRICK (2011). Eastern District of Texas – Leaving the playing field. [Online] Available from <http://gametimeip.com/2011/01/07/eastern-district-of-texas-leveling-the-playing-field/>. Last Accessed on 16 June 2014.

¹⁵⁴ MULLIN, Joe (2014). Newegg and friends crush a patent troll. [Online] Available from: <http://arstechnica.com/tech-policy/2014/04/newegg-and-geico-stop-patent-troll-that-sued-dozens-over-forms-on-apps/>. Last accessed on 24 April 2014.

¹⁵⁵ DESCHAMPS, Carole (2011). Patenting computer-related inventions in the US and in Europe: the need for domestic and international legal harmony. *E.I.P.R.*, 33(2). p.113.

app developers and the companies that implement the asserted apps.

In the case of Lodsys, the defendants are small app developers who have insufficient ability to sustain long lasting and costly lawsuits, and in this case, the plaintiff company will be in the ascendant and can ask for payment, even if its patent is invalid or not as broad as it asserted. What is worse, despite not aiming to sue a major or small-scale company, MarcoSolve adopted a strategy of sue-first-ask-questions-later, which renders the defendant companies less opportunity to seek remedial measures outside the court. Unlike Lodsys, who at least sent letters to the defendants before filing the litigation, MarcoSolve seems to more aggressively pursue business development than most patentees in the patent battle of apps.

Apple once reacted to the lawsuit filed by Lodsys, arguing that it paid license fees to the previous owner of the asserted patent, so that the developers of its iOS platform were not liable to pay fees to Lodsys. Unfortunately, the court dismissed this motion in September 2013 and allowed the plaintiff company to settle all the cases with the defendants.¹⁵⁶ What is worrying is that, if small companies or individuals are threatened by a lawsuit they cannot afford, they will either end up paying unreasonable fees or give up the development, even if they are actually devoted to innovation. Such a patent policy adopted is in danger of strangling the opportunities for application software and limiting the prospect of smartphone operating systems. This will not only damage the benefits of the companies and app developers in the

¹⁵⁶ Decision made in the United States District Court for the Eastern District of Texas Marshall Division. Available from: <http://zh.scribd.com/doc/171996136/Apple-Motion-Dismissed>. Last accessed 18 November 2013.

lawsuit, but also represent a huge loss to society.

4.3.3. Patent disputes – Not just a matter of a single patent type

Communication technology patents in the smartphone industry are normally SEPs; patent holders are liable to license their patent to any individual under FRAND terms. Holders of such a SEP may face investigation by antitrust authorities if they refuse the license or impose unreasonable terms on licensees. In contrast, patenting software and design features are more likely to prevent patent holders' rivals from mimicking their work and thus, place the patent holder in an advantageous position. This might be one of the reasons of why more smartphone companies have begun to focus on patenting software features and the design of user interfaces in business strategies. Even Samsung, which owns a considerable communication-related portfolio, has exploited the function to apply it to the software features in its lately-produced Galaxy 4.¹⁵⁷

Nonetheless, patenting software does not necessarily mean placing the game in the applicant's hands; rather, the strict interpretation of the patentability of software in Europe creates a risk of not being granted a patent. This is especially more potential in Europe than in other countries, like the US and Korea, despite the increasing importance of software feature inventions in the smartphone industry. As mentioned in the case of Apple and HTC, computer programmes are excluded from patentable inventions in Europe. Although this does not mean the negation of patenting software features for smartphones, more rigorous requirements need to be fulfilled to make a software invention patentable. Moreover, patent applications related to

¹⁵⁷ HOYLE, Ben (2013). Apple v Samsung: the art of war. *E.I.P.R.*, 35(9), p. 496.

such inventions usually face careful examination in case the claim may lead to a computer programme product, which does not constitute patentability.

Patenting ideas like the features and design of a device is also confronted by other disadvantages under the current patent system. Patent protection granted to such inventions is relatively narrow.¹⁵⁸ Namely, the protection is specific to the feature in the patent claim, and the patent holder's competitors can easily avoid applying the same techniques or technology and create a substitute feature with a similar function. An interesting case is that Apple once won a patent litigation against Motorola over its slide-to-unlock patent in the German court in 2012.¹⁵⁹ This victory enabled Apple to require the removal of Motorola's products that applied the said feature. Although being ruled invalid by the appeal court in Germany later in 2013 for the reason of obviousness,¹⁶⁰ the validity of Apple's slide-to-unlock patent does not seem to be too important because its competitors have created other unlock designs and implemented them in their smartphones. From the perspective of the software feature inventors, this seems to be a deficiency of patent protection; nevertheless, it can be regarded as being beneficial for consumers since it facilitates a variety of smartphone features and designs to choose from. It also stimulates smartphone companies to engage in further R&D of attractive and elaborate products.

4.4. Problems

¹⁵⁸ TOTHILL, John (2012). The mobile phone patent wars. *C.T.L.R.*, 18(4), p. 95.

¹⁵⁹ Landgericht Munchen (*Apple v Motorola*) Unreported February 16, 2012 (Germany).

¹⁶⁰ Foss Patent (2013). Apple's slide-to-unlock patent invalidated in German (decision is appealable). [Online] Available from: <http://www.fosspatents.com/2013/04/apples-slide-to-unlock-patent.html>. Last accessed on 10 April 2014.

4.4.1. Patent trolls in a thicket environment

Technological devices like smartphones and tablets have taken a good deal of the market share from the sale of conventional mobile phones, personal computers, and even laptops.¹⁶¹ Such sophisticated devices are usually comprised of various components that may be held by more than one patent owner; this feature leads to the fact that communication techniques are fragmented as a consequence of the different proprietary functions. In other words, an inventor has to “hack through” the patents necessary for an advanced product if he intends to create a new one.¹⁶² It is inevitable that inventors have to obtain multiple licenses from the right holders of the overlapping set of patents to access each useful art and such a case of stacking a dense network of overlapping patents is known as a “patent thicket”.

In the patent thicket environment, companies are burdened with being licensed to lawfully use certain technologies and commercialise products. If a SEP holder asserts its patent rights for trolling purposes, inventors may be in a worse position because the patent holder may ask for fees and inventors who have no alternative technology to apply, can only accept it if they have sunk large funds into developing the product or abandon commercialisation if they cannot afford to pay.

In the US case of *eBay Inc. vs. MercExchange, L.L.C.*, Kennedy J. of the US Supreme Court concurred with an opinion against firms that do not use patents for producing and selling products, but only to obtain licensing fees. In his statement, he indicated that an injunction or relevant sanction “can be employed as a bargaining tool to

¹⁶¹ HOYLE, Ben (2013). *Apple v Samsung: lessons from a global intellectual property war. C.T.L.R.*, 19(4), p. 63.

¹⁶² SUBRAMANIAN, Sujitha (2008). Patent trolls in thickets: who is fishing under the bridge? *E.I.P.R.*, 30(5), p. 183.

charge exorbitant fees to companies that seek to buy licenses.”¹⁶³ He also declared that, if the patent concerned only relates to a small component of the product, an injunction should not be awarded to the patent owner because the “undue leverage in negotiation” is harmful to the public interest.

It is understandable that some companies would like to collect patents as a defensive means; for example, if a company is accused of infringing another’s patent, it has the chance to mitigate the damage from a lawsuit by making a counterclaim with one of the numerous patents in its portfolio. However, unfortunately, some ensnare unwitting users who utilise the patent and use it to institute proceedings. Such a threat of legal action is likely to constitute a patent hold-up.¹⁶⁴ Therefore, trolling damages the market economy of the industry because it contravenes the essence of patent protection and exacerbates the incompatibility between the legal interests of patent and competition law.

4.4.2. The different US and EU approaches

It is worth noting that there are varying degrees of patent troll incidents in the US and Europe due to a somewhat different cognisance of anti-competitiveness in these two regions. Section 101 of the US Patent Act is interpreted to mean that Congress intended to grant a patent to “everything under the sun that is made by man.”¹⁶⁵ Any method or process is eligible to be awarded a patent as long as it meets the other requirements of patentability. By virtue of this, companies are able to patent their

¹⁶³ *eBay Inc.et. al. v MercExchange, L.L.C.* 547 U.S. 388 (2006). Concurring opinion available at: <http://www.supremecourt.gov/opinions/05pdf/05-130.pdf>. Last accessed 11th October 2013.

¹⁶⁴ CHIEN, Colleen V. and LEMLEY, Mark A. (2012). Patent holdup, the ICT, and the public interest. *Cornell Law Review*, Stanford Public Law Working Paper No. 2022168, p. 102.

¹⁶⁵ *Diamond v Chakrabarty*, 447 U.S. 303 (1980).

works or purchase them from other entities, which simultaneously results in a deluge of patent infringement lawsuits because the more patents in the market, the easier it is to innocently infringe them.¹⁶⁶ Such an environment spontaneously fosters the rampant growth of patent trolls in the US; conversely, trolling activities seem relatively less common in Europe.

The EPC lists the inventions that are not regarded as being patentable,¹⁶⁷ and these include business methods and computer programmes. Although a directive regulating software patents was proposed in the EU, it was rejected by the European parliament in 2005.¹⁶⁸ Thus, since acquiring a patent is not as simple as it is in the US, patent trolls are less active in Europe.

Other factors that deter trolling activities in Europe are caused by the configuration of jurisdiction of European patents and the way in which European courts charge litigation costs. The EU is formed of many European countries; however, due to the absence of a community patent court and precise criteria for filing a patent lawsuit, patent enforcement mainly relies on the national courts of MSs and their patent policies. Hence, patent holders have to lodge lawsuits in different countries with various patent rules. As a matter of course, these courts may have multiple explanations of patent laws and hold different rulings when determining infringement,¹⁶⁹ and this is definitely a factor that does not appeal to patent trolls.

¹⁶⁶ OHKUMA, Yasuo et al (2007). Patent trolls in the US, Japan, Taiwan and Europe (Digest). *Tokugikon*, I. 30. No. 244, p. 80. Available from; <http://www.tokugikon.jp/gikonshi/244kiko1e.pdf>. Last accessed on 11th October 2013.

¹⁶⁷ Article 52(2) of the EPC.

¹⁶⁸ HAUNSS, Sebastian (2013). *Conflicts in the knowledge society. The contentious politics of intellectual property*. 1st ed., Cambridge, Cambridge University Press, p98.

¹⁶⁹ SUBRAMANIAN, Sujitha (2008). Patent trolls in thickets: who is fishing under the bridge? *E.I.P.R.*, 30(5), p. 187.

With regard to the litigation costs in patent cases, a loser-pays system is applied in civil cases in Europe. Unlike the lawyer's contingent fee in the US, it is uncommon for a party and its lawyer to arrange the fee in Europe.¹⁷⁰ This raises the risk of paying litigation and attorney fees if the trolling patent owner loses the lawsuit. Furthermore, since litigation fees are lower in Europe than in the US, the effect of threatening unsuspecting infringers with litigation may not be as attractive as it is in the US.¹⁷¹

Accordingly, although the US approach is in patent holder's favour; it also creates patent protection that fosters patent trolls. Adversely, being granted patent in the EU is relatively uneasy and troublesome; yet, patent troll has less chance to practice its strategies. However, sometimes, it only requires one valid patent to form a patent troll; such as the example demonstrated by MarcoSolve. Hence, it can be seen that, for solving patent troll problems, to deploy prudent patent examination seems more important than restrain patent enforcement or antitrust sanctions.

4.4.3. A desirable international harmonised patent system

Since a smartphone device contains thousands of patents, it is normal that a device can infringe multiple patents from many countries in one time. Moreover, a type of smartphone can be sold to worldwide; patent holders have to enforce its rights in each territories to acquire the injunctions against the infringing device. This reveals that, both to patent holders and infringers, the lack of consistent patent system

¹⁷⁰ *Ibid.*

¹⁷¹ OHKUMA, Yasuo et al (2007). Patent trolls in the US, Japan, Taiwan and Europe (Digest). *Tokugikon*, I. 30. No. 244, pp. 85-86. Available from; <http://www.tokugikon.jp/gikonshi/244kiko1e.pdf>. Last accessed 11th October 2013.

brings inconvenience when they get involved in patent disputes.

In the EU, the lack of a uniformed patent litigation mechanism means that patent holders need to be familiar with the interpretation of the patent rules of different nations, and lodging many arguments in many regional courts constitutes a burden for patent holders. This predicament can be extended to a global context because patent owners may hope to acquire a global patent to protect their works on a worldwide basis. For this reason, there are calls for a harmonised patent system in the EU and even a global patent system in order to ensure that a patent can be appropriately enforced without troublesome, time-consuming, and costly proceedings.¹⁷²

To begin with a problem that has long existed in the EU, there is, in fact, a legal basis for the procedure of granting a European patent. According to the EPC, a single patent application can be filed at the EPO, central industrial property office, or other competent authority in the context of not conflicting with the law of contracting states.¹⁷³ What leads to this being unsatisfactory is that such a legal basis only provides for the possibility of acquiring an EU patent from the EPO and practicing it in the contracting states, but not gaining a patent that is approved and enforceable right across the EU. In other words, if patent holders hope to accuse a third party of infringing their patent in more than one country in Europe, they have to have their patent validated in those countries and have filed patent litigation in each of them in order to enforce patents.¹⁷⁴

¹⁷² PEHLIVAN, Ceyhun Necati (2012). The creation of a single European patent system: from dream to (almost) reality. *E.I.P.R.*, 34(7), pp. 455-456.

¹⁷³ Article 75(1)(a) and (b) of the European Patent Convention.

¹⁷⁴ *Supra.*, note 152 at p. 453.

The first key factor in calling for a harmonised patent system in the EU is the burdensome expense of patent application and litigation. According to the principle of the primacy of claims, a patent claim provided by the patent applicant is the crucial basis for determining the patentability of an invention at national patent offices.¹⁷⁵ According to the EPC, a European patent that is applied for at EPO has to be filed in one of three official languages.¹⁷⁶ However, the most costly expenditure is the translation fees after the patent is granted and the annual renewal fees, which have to be paid individually in each country.¹⁷⁷ Apart from the translation fees, the costs of launching patent enforcement in national countries is also a financial burden, especially when the patent holder wants to file a lawsuit in multiple countries. Additional expenditure is also needed for a national expert in the prosecuting country, as a national professional representative is required in most European countries.¹⁷⁸

Next, another reason for a harmonised patent system is the quest for a specialist patent court, which only considers patent disputes with Europe-wide decisions and injunctions. Cross-border patent cases are normally dealt with by the national courts of MSs, and referred to CJEU for a preliminary ruling in case of further questions.¹⁷⁹

Notwithstanding the CJEU receiving referrals, its duty is not particularly to settle

¹⁷⁵ ROMANDINI, Roberto and KLICZNIK, Alexander (2013). The territoriality principle and transnational use of patented inventions – the wider reach of a unitary patented and the role of the CJEU. *IIIC*, 44(5), 530.

¹⁷⁶ Article 14 (1) of the European Patent Convention stipulates that its official language shall be English, French and German.

¹⁷⁷ KAZI, Ilya (2011). Will we ever see a single patent system covering the EU, let alone spanning the Atlantic or Pacific? *E.I.P.R.*, 33(8), p. 539.

¹⁷⁸ *Ibid*, p. 455.

¹⁷⁹ Article 267 (b) of the TFEU.

patent disputes, but to deal with the controversies of European law. With its sharply increasing number of caseloads due to recent European development,¹⁸⁰ a centralised European patent court could not only slightly moderate this burden, but more importantly raise the quality of patent judgment with its professional expertise. As far as patentees are concerned, they would only need to file a single litigation for such a patent without having to struggle with the complex jurisdiction defined in different national laws; yet, the court's decision or injunction would be recognised across the whole of Europe.¹⁸¹ On the other hand, it could also prevent "forum shopping", ¹⁸² which means that it could reduce the number of choices of national courts to bring an indictment by speculators with a patent policy that is in favour of the patent holder. Hence an integrated patent system with a unified court is sought to create more efficient patent protection in Europe.

Furthermore, the patent litigation systems in each European country are not quite the same, nor are the patentability and estimation of patent validity and its infringement. Based on the principle of territoriality, a European patent is only effective within the territory where the right is awarded to the patent holder. Thus, a national court other than that of the patent territory has no jurisdiction to judge its patent disputes and should refuse enforcing relevant judgment in the light of this principle.¹⁸³ Due to the lack of a single patent court in Europe, patent holders file

¹⁸⁰ PISTOLESI, Roberto (2013). The role of the CJEU in relation to patent disputes, particularly under the UPC. [Online] Available from: http://www.dragotti.com/images%5Ccrp_articoli%5CThe%20role%20of%20the%20CJEU%20in%20relation%20to%20patent%20disputes.pdf. Last Accessed 26 October 2013.

¹⁸¹ PHELIVAN, Ceyhun Necati (2012). The creation of a single European patent system: from dream to (almost) reality. *E.I.P.R.*, 34(7), p 459.

¹⁸² KAZI, Ilya (2011). Will we ever see a single patent system covering the EU, let alone spanning the Atlantic or Pacific? *E.I.P.R.*, 33(8), p. 539.

¹⁸³ ROMANDINI, Roberto and KLICZNIK, Alexander (2013). The territoriality principle and transnational use of patented inventions – the wider reach of a unitary patented and the role

parallel litigation based on the same facts, which unfortunately sometimes leads to a contradiction in the decision of different national courts.

This inconvenience may be considerably mitigated in Europe by virtue of the lately-adopted system in pan-European territory which is discussed later in Chapter 6 with other legal approaches adopted to assist the patent system.

4.4.4. Legal certainty of patent protection

Patent protection enables right holders to accuse a third party who engages in unauthorised utilisation, and competition policies are adopted to prevent speculators from using this right to interfere with market competition. Yet, if competition policies interfere with patent rights, it is undeniable that innovation will be restricted because such an intervention is likely to confine the nature of the patent.¹⁸⁴ In this case, whether competition law should be applied over the protection awarded by patent law is questionable. A patent is only valuable when an infringement is prosecuted for violating it because this demonstrates that the patent is valid and enforceable.¹⁸⁵ Therefore, if competition policies bar the enforcement of a patent, it will lead to legal uncertainty in terms of right holders' legitimate expectation to exercise their rights.

From a general perspective, it is important that IP protection covers every dimension when it comes to policy-making. Apart from technology companies, which benefit directly from patents, the policy-making should also consider the welfare of society

of the CJEU. *IIC*, 44(5), p. 530.

¹⁸⁴SCHREPEL, Thibault (2013). Patent troll through the US and EU antitrust law: when co-operation is no longer an option. *E.C.L.R.*, 34(6), p. 320.

¹⁸⁵ *Ibid.*

in general, since this will eventually be indirectly impacted by intellectual property policies.

In its quest to remain competitive in the smartphone market, Apple's ultimate enemy is Google, the creator of the Android operating system, which is applied by most other mobile manufacturers, like HTC, Samsung and Motorola¹⁸⁶. As a matter of course, neither Apple nor the Android operating device suppliers will abandon such a lucrative business; therefore, patents are the best method to ensure the circulation of their products and, more importantly, block others from introducing alternative products. Ideally, from the perspective of the whole information society, the more suppliers there are of a specific device, the more choices are available for consumers; however, patents, which were meant to encourage innovation, have become the means to restrict it.

The ideal solution to the contradiction between the legal interests protected by IP law and competition law is not as simple as reducing or sacrificing any legal interest. IP right holders expect to acquire effective protection and a reasonable financial reward to recoup their investment.¹⁸⁷ Hence, IP law secures this expectation asked by right holders. This is also the core essence of the patent system. It is evident that global technology will be hugely impacted if right holders' expectations cannot be met because no company wants to work for nothing.¹⁸⁸ It is certainly true that the current patent policy-makers should pay attention to the problem of patent abuse; however, it is also important to prevent them from overdoing it.

¹⁸⁶ ILTAN, Cigdem (2011). Waging a patent war. *Maclean's*, Vol. 124, Issue 31, p. 36.

¹⁸⁷ TOTH, Andras (2008). Protection of investments in European abuse of dominance cases. *E.C.L.R.*, 29(12), p. 711.

¹⁸⁸ ANN, Christoph (2011). Patents, piracy and competition. *ICC*, 42(8), pp. 877-878.

4.5. Brief conclusion

Patent litigations among famous smartphone suppliers do not only impact the parties involved. In the aforementioned case, Samsung regretted the verdict that awarded Apple more than a billion dollars as compensation and stated, “Today’s verdict should not be viewed as a win for Apple, but as a loss for the American consumer.”¹⁸⁹ It also proposed that the impact of the verdict could lead to fewer choices, less innovation, and potentially higher prices. Moreover, it is believed that the victory in this case encouraged Apple to file more patent litigations against its rivals.¹⁹⁰

In order to ensure patent protection and simultaneously preserve the public interest, the employment of competition regulations to defuse the conflict between private patent right and public interests should stand by the principle of minimising the damage to patent. Standardising patents is one of the methods to cope with the patent fragmentation in the smartphone industry; yet there have been many cases regarding the enforcement of SEPs (discussed in subsequent chapters), which manifest the sign that this regime may preclude the effective dissemination of patents.

Due to the importance of SEPs in the market, the patent ambush problem they cause is worse than non-SEPs. Accordingly, when an SEP holder file a patent litigation

¹⁸⁹ The full statement from Samsung is available via <http://www.theverge.com/2012/8/24/3266653/samsung-todays-apple-trial-statement-loss-american-consumer>. Last access on 1 May 2013.

¹⁹⁰ HABENICHT, Jeffery (2012). Apple Inc. v. Samsung Electronics Co., LTD.. Available from <http://jolt.law.harvard.edu/digest/patent/apple-inc-v-samsung-electronics-co-ltd>. Last access 3 May 2013.

and/or request injunction relief, it is necessary to examine its motives if it does not benefit other honest rivals in the market. It is especially crucial when the defendant is in a weaker position in the license negotiation. With regard to those who already have a certain influence in the market, like the major smartphone companies, it is true that their patent should be ensured like all others; however, the urgent task is to monitor their conduct which may unduly expand their patents and endanger the entire industry.

Current policy drivers and the relationship with competition law

5.1. Introduction

The efforts in practice that tend to increase the accessibility of patents. In the standardisation section, the European approach will be taken as the main example since its Horizontal Guidelines have explicitly given an indication of the application of competition law. The difficulties to obtain a licensing agreement will also be illustrated and then the justification for refusing a license will be introduced. This section will also establish a foundation for the compulsory licensing remedy in Chapter 7.

5.2. Standard essential patent in the ICT industry

5.2.1 Background – How does standards influence competition?

In view of the variety of smartphone devices and services provided by different suppliers, standards are required to facilitate the quality, safety, interoperability and compatibility of each product or service.¹⁹¹ These are described as aspects of technology that enable devices to work together; such as 3G, Wi-Fi and Bluetooth.¹⁹² From the perspective of smartphone consumers, SEPs enable products and services from different developers to work together and increases substitutability. It facilitates

¹⁹¹ ZHANG, Liguó (2010). Refusal to license intellectual property rights under article 82 EC in the light of standardisation. *E.I.P.R.*, 32(8), p. 402.

¹⁹² MAIR, Carl (2013). The uneasy interface between patent law and competition policy. [Online] Available from: <http://leidenlawblog.nl/articles/the-uneasy-interface-between-patent-law-and-competition-policy>. Last accessed on 7 April 2014.

the overall size of the smartphone market to have more comprehensive economies of scale.¹⁹³ In terms of smartphone devices providers, standardisation creates an opportunity to pool technological information by virtue of assembling the expertise of a variety of specialities, and it also assists the convenience and efficiency of innovative activities. Therefore, technical standards are considered pro-competition and supposed to be welcomed by market participants and even consumers because they enhance the value of products and the return on investment.¹⁹⁴

However, IP rights protection grants right holders exclusive rights; on the contrary, standards seek to establish a “common pool of knowledge” so that the standardised information can be applied by everyone.¹⁹⁵ While standard-setting indicates the characteristics a product must have to be compatible with the uniformed market demand, it is inevitable that it also covers the proprietary rights that are protected by patent law. Thus, holders of SEPs occupy a dominant position in the downstream market, and with their potential to prohibit market participants from using the technology, their market power becomes a means of “turning the standard from an open to a closed standard.”¹⁹⁶ In this way, standards can cause anticompetitive concerns.

5.2.2. Legal basis of standardisation

Standardisation reflects the antitrust requirements in the TFEU. The Regulation of

¹⁹³ BONADIO, Enrico (2013). Standardization agreements, intellectual property rights and anti-competitive concerns. *Q.M.J.I.P.*, 3(1), p.3.

¹⁹⁴ MARINIELLO, Mario (2011). Fair, reasonable and non-discriminatory (FRAND) terms: a challenge for the competition authorities. *J.C.L. & E.*, 7(3), p. 523.

¹⁹⁵ ZHANG, Ligu (2010). How the IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), p. 383.

¹⁹⁶ BONADIO, Enrico (2013). Standardization agreements, intellectual property rights and anti-competitive concerns. *Q.M.J.I.P.*, 3(1), p. 4.

the European Parliament and of the Council on European standardisation gives legal basis to use European standards for identifying ICT technical specifications and confirms that standards brings positive economic effect, increase competition and benefits economics as a whole.¹⁹⁷ The concept of promoting competition also exists in US antitrust law. The Telecommunications Industry Association (the “TIA”) is the accredited SSO by the American National Standards Institute in order to enhance the industry standards in ICT in the US.¹⁹⁸ As for the relationship to IP, pursuant to the ETSI Guide on Intellectual Property Rights, its IP rights policy minimised this tension and therefore identified the involvement of IP rights policies in standardisation procedures.¹⁹⁹

Apart from the above regional standard institutes, there is also a global standard institute, the International Telecommunication Union (the “ITU”) which plays a leading role in the standardisation of ICT and improves it to be accessible to worldwide. In cases of IP rights hold-up, although some SSOs adopt IP policies to ensure the disclosure of SEPs and the accessibility of patent licenses under reasonable conditions, these IP policies are not necessarily available in every SSO.²⁰⁰ Nevertheless, the TIA, ETSI and ITU decide the major mobile telecommunication standards in the world and they all adopt the IP rights policy in the standardisation process.²⁰¹ This reveals the inescapable fact that competition law and IP law should

¹⁹⁷ Paragraph 3 of the Regulation (EU) No. 1025/2012 of the European Parliament and of the Council of 23 October 2012 on European standardisation.

¹⁹⁸ Telecommunications Industry Association. [Online] Available from: <http://www.tiaonline.org/standards/>. Last accessed on 25 Sep 2013.

¹⁹⁹ ETSI Guide on Intellectual Property Rights (IPRs), 2011. [online] Last accessed 25 Sep 2013 from <http://www.etsi.org/images/files/IPR/etsi-guide-on-ipr.pdf>.

²⁰⁰ ZHANG, Liguó (2010). Refusal to license intellectual property rights under article 82 EC in light of standardization context. *E.I.P.R.*, 32(8), pp. 403-404.

²⁰¹ ZHANG, Liguó (2010). How the IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), p. 387.

be simultaneously considered in order to address the hold-up and ambush problems in the technology industry.

5.2.3. Conflicition between patent and competition in standard-setting

The standards in the mobile telecommunication industry are said to be especially significant and complex.²⁰² This is due to the fierce competition in the smartphone market where companies invest in a high level of R&D and the patenting intensity which makes such patents fragmented into numerous exclusive ownerships. Contrarily, in line with the purpose of standard-setting, patents sometimes have to be accessible to every participant in the market, especially those that are essential and cannot be bypassed when applying a standard. These are so-called SEPs.²⁰³

Standards are normally formulated by SSOs, which are composed of industry-specific participants.²⁰⁴ A technology is selected from several alternatives in the industry to be the standard of a certain smartphone component or network service. However, if the chosen technology is patented, there is a risk that the patent holder will block its competitors from entering the market by hold-up SEPs or ask for exorbitant fees; this problem highlights the tension between patent protection and competition law.²⁰⁵

5.2.4. FRAND commitments and the Horizontal Guidelines

Being aware of the problem of patent hold-up, patentees are often required to license their patents under proper terms before a technology is adopted as a

²⁰² *Ibid.*, at p 384.

²⁰³ CARRIER, Michael A (2012). A roadmap to the smartphone patent wars and FRAND licensing. *CPI Antitrust Chronicle*, April (2), p. 2.

²⁰⁴ *Ibid.*

²⁰⁵ TORTI, Valerio (2012). IPRs, competition and standard setting: in search of a model address hold-up. *E.C.L.R.*, 33(9), p. 387.

standard. The normal accepted terms of licensing a SEP in the EU are known as FRAND, which is an acronym for fair, reasonable and non-discriminatory.²⁰⁶ The main aim of the FRAND terms is to ensure that patentees will forfeit their right to refuse to license essential patents or only license patents when they will gain an advantage.²⁰⁷

FRAND licensing does not merely consider patent rights, but also anti-competitive issues.²⁰⁸ According to the IP policies of the SSOs, IP right owners, especially those who owns SEPs in the industry, should grant irrevocable licenses with a FRAND license commitment to other participants in the industry. Confirmation that a FRAND commitment assists standard-setting is provided in the European Commission's Horizontal Guidelines,²⁰⁹ in which it is indicated that the SSO "would need to ensure effective access to the standard on fair, reasonable and non-discriminatory terms."²¹⁰ Unfortunately, there is no clear definition of what constitutes fair, reasonable, and non-discriminatory.²¹¹

Despite the lack of an explicit definition of FRAND terms, the implication of these terms can always be deduced from relevant regulations, commentaries and case law. To begin with, the fairness in FRAND has been defined to mean that a dominant

²⁰⁶ CARRIER, Michael A (2012). A roadmap to the smartphone patent wars and FRAND licensing. *CPI Antitrust Chronicle*, April (2), p 2.

²⁰⁷ MARINIELLO, Mario (2011). Fair, reasonable and non-discriminatory (FRAND) terms: a challenge for competition authorities. *J.C.L. & E.*, 7(3), p. 524.

²⁰⁸ CARRIER, Michael A (2012). A roadmap to the smartphone patent wars and FRAND licensing. *CPI Antitrust Chronicle*, April (2), p. 5.

²⁰⁹ Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements. Available from: [http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52011XC0114\(04\):EN:NOT#to](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52011XC0114(04):EN:NOT#to) p. Last accessed 3 Jan 2013.

²¹⁰ Paragraph 283 of the Horizontal Guidelines.

²¹¹ SATTLER, Sven (2011). Standardisation under EU competition rules – the Commission's new horizontal guidelines. *E.C.L.R.*, 32(7), p. 347.

company does not impose any irrelevant obligation as a cost of applying its patents.²¹² In addition, right holders must not refuse to license SEP unless they have objective justification to do so.²¹³

Next, FRAND requires the standard commitment to be “reasonable” which mainly concerns the matter of royalties. According to the provision of the TFEU, imposing “unfair purchase or selling prices or other unfair trading conditions” is deemed to be the abuse of a dominant position.²¹⁴ On the other hand, the Horizontal Guidelines forbid right holders to request unfair or unreasonable fees by charging discriminatory royalty fees,²¹⁵ and this is accompanied by a note that “unreasonable fees” means excessive charges. Therefore, charging excessive fees without a reasonable relationship to the product’s economic value constitutes the abuse of a dominant position.

With regard to the non-discriminatory requirement, the provision of the TFEU states that imposing dissimilar conditions on the equivalent transactions of other trading parties is regarded as being the abuse of a dominant position;²¹⁶ for example, charging one of the participants a certain fee while charging another a higher fee. In fact, when a right holder has the ability to impose discriminatory conditions on its rivals, it has a certain level of market power. This requirement is to prevent right holders from obtaining a competitive advantage over disfavoured parties.

²¹² ZHANG, Liguó (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), pp. 397-398.

²¹³ ROTONDO, Elisabetta (2012). European Commission initiates proceedings against Samsung for abuse of dominance by failing to license its standard-essential patents on fair, reasonable and non-discriminatory terms. *E.C.L.R.*, 33(8). p. 349.

²¹⁴ Article 102(a) of the TFEU.

²¹⁵ Paragraph 287 of the Horizontal Guidelines.

²¹⁶ Article 102(c) of the TFEU.

However, being adopted as SEPs does not necessarily constitute abuse of dominant position, albeit SEPs holders do have some level of market power. The Horizontal Guidelines provide exceptions in addition to the application of FRAND commitments, which state that standardisation agreements do not fall under the prohibition of restrictive agreements in Article 101 of the TFEU. One of these is that there should be no obligation to comply with the standard in the agreement,²¹⁷ while another is that that participation in standard-setting should be unrestricted so that every affected competitor is able to select the standard.²¹⁸ Finally, the Guidelines also mention that the procedure for adopting the standard should be transparent and therefore allow stakeholders to be informed about the pertinent work in good time at each stage of the standardisation.²¹⁹ This ensures that the standardisation agreement does not conflict with competition rules and can be applied to respond to the demands of each participant. These exceptions are commonly regarded as a “safe harbour” that permits standardisation agreements to create market power without damaging market competition.²²⁰

5.2.5. Discussion

5.2.5.1. The lack of FRAND definition

The significance of standard-setting in communication technologies was affirmed by the Vice President of the European Commission responsible for Competition Policy in

²¹⁷ Paragraph 280 of the Horizontal Guidelines.

²¹⁸ Paragraph 281 of the Horizontal Guidelines.

²¹⁹ Paragraph 282 of the Horizontal Guidelines.

²²⁰ BONADIO, Enrico (2013). Standardization agreements, intellectual property rights and anti-competitive concerns. *Q.M.J.I.P.*, 3(1), p. 6.

a speech early in 2012.²²¹ He also noted the phenomenon of companies using patents as a strategy to acquire market power and hence increase their competitiveness. In this respect, the current standard-setting mechanism seems to be lacking. Article 101 of the TFEU is a good example of this, since it does not require SSOs to verify that the licensing agreement between participants meets FRAND conditions, but merely relies on participants' negotiation and self-assessment.²²² This may raise a risk that licensees may still have to compromise with specious FRAND terms, which are actually not, in order to access a SEP.

It has been said that, from the perspective of patent holders, the patent system is "based on something of a lottery principle" because inventors have to bear the risk of failure, yet they "hold out the prospect of monopoly" if the patent is successful.²²³ To demonstrate the inconsistency of the FRAND terms, Apple composed a letter to the ETSI, proposing that three elements should be considered to ensure the transparency and consistency of the application of FRAND terms.²²⁴ One of these was to defer to an appropriate royalty rate on the basis of reflecting the portfolio of SEPs

²²¹ Joaquín Almunia, Vice President of the European Commission responsible for Competition Policy Industrial policy and Competition policy: Quo Vadis Europa? New Frontiers of Antitrust 2012 – Revue Concurrences Paris, 10 February 2012. [Online] Available from: http://europa.eu/rapid/press-release_SPEECH-12-83_en.htm?locale=en. Last accessed 5 Jan 2013.

²²² ROTONDO, Elisabetta (2012). European Commission initiates proceedings against Samsung for abuse of dominance by failing to license its standard-essential patents on fair, reasonable and non-discriminatory terms. *E.C.L.R.*, 33(8), p. 349.

²²³ Areeda and Kaplow (1997). Cited from: ZHANG, Liguang (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), p. 399.

²²⁴ Original version available via MULLER, Florian (2011). 11-11-11 Apple letter to ETSI on FRAND. [online] Available from : <http://zh.scribd.com/doc/80899178/11-11-11-Apple-Letter-to-ETSI-on-FRAND>. Last accessed 16 Jan 2013. See also ROTONDO, Elisabetta (2012). European Commission initiates proceedings against Samsung for abuse of dominance by failing to license its standard-essential patents on fair, reasonable and non-discriminatory terms. *E.C.L.R.*, 33(8), pp. 349-350.

and their economic value to the industry. Another suggestion was that royalty fees should be no higher than the average price in the same industry, and while this suggestion has been adopted by the Horizontal Guidelines and the relevant US department, the third suggestion has not been advocated in the industry.²²⁵ This was that no injunction should be imposed on patent holders' competitors in case those competitors have to pay an unreasonable amount for the license. This suggestion is arguable because it seems to overlook the protection of patent holders and deprive their legitimate rights granted by patents.

On the other hand, it is argued that FRAND conditions are insufficiently effective because potential licensees may be deterred by the complex and uncertain economic terms, which could confuse them about which standard is going to be licensed to them. In this case, market participants would avoid becoming involved in standard-setting affairs. This may further reduce their motivation to launch innovative activities because the products they create may become subjected to law suits if they become SEPs or they have to apply such patents.²²⁶

5.2.5.2. Good faith Disclosure requirement

The IP right policy of standardisation indicated by the Horizontal Guidelines requires participants to disclose their IP rights in good faith on an ongoing basis so that the industry will have an informed choice of technology to enable effective access to a standard.²²⁷ This obligation also requires "reasonable endeavours" to identify IP right

²²⁵ *Ibid.*

²²⁶ TORTI, Valerio (2012). IPRs, competition and standard setting: in search of a model address hold-up. *E.C.L.R.*, 33(9), p. 390.

²²⁷ Paragraph 286 of the Horizontal Guidelines.

reading on future IP rights. The significance of the good faith disclosure to the development of technological standards can be reflected in the prominent *Rambus* case, which is considered as patent ambush, in both the European Commission and the FTC in the US. Rambus was found to have abused its dominant position by concealing its patents and asking for high royalties after it was adopted as standard and widely applied in the industry.²²⁸ (This case will be analysed in Chapter 6.)

This reveals that the disclosure of IP right information is important to both SSO participants and IP right holders when the right at issue is essential to an industry. The risk of patent ambush remains because IP right policies do not normally provide an explicit requirement of disclosure; the right holder's intentional deception by hiding its IP rights would enable it to evade its FRAND commitments.²²⁹ On the other hand, it has been argued that searching patents under the disclosure obligation is costly; it especially burdens a patent holder with a large portfolio.²³⁰ Even if patent holders manage to do so, it cannot be guaranteed that the disclosed IP information is essential to the industry.

An example can be seen from the UK High Court of Justice, when its patent court ruled in *Nokia vs. Interdigital Technology* that three out of four essential patents claimed by the defendant were not essential to the 3G mobile telecommunication standards in Europe.²³¹ A similar problem may also arise in the disclosure of future patent claims and pending applications. Patent examination is a complex and long

²²⁸ SATTLER, Sven (2011). Standardisation under EU competition rules – the Commission's new horizontal guidelines. *E.C.L.R.*, 32(7), pp. 346-347.

²²⁹ *Ibid.*

²³⁰ ZHANG, Ligu (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), p.388.

²³¹ *Nokia Corp v Interdigital Corp* [2007] EWHC 3077 (Pat).

procedure, and patent holders may be limited by policies, such as the secrecy of patent application and the alteration of patent claims, and thus unable to provide elaborate information. There is also no guarantee that a patent would eventually be granted to the applicant.²³² In general, the disclosure is regarded as exacerbating the uncertainty of standardisation and is not always helpful for standardising essential patents.

5.2.5.3. Summary

Although the setting of standards addresses the problems of patent hold-ups and patent ambush, it should also be emphasised that the standardisation of a patented work does not automatically lead to the abuse of a dominant position. According to the German Federal Supreme Court, if licensors have objective and justified reasons to refuse a license or charge different fees for different trade parties for equivalent transactions, it will not be considered to be ambushing.²³³

The standardisation of essential patents relies on the careful selection of appropriate technical standards to be scrutinised on a case-by-case basis in consideration of FRAND terms. Furthermore, the relevant authorities should clarify the terms for applying a standard in order to provide participants with a clear idea and ensure fair competition in the market.

²³² BONADIO, Enrico (2013). Standardization agreements, intellectual property rights and anti-competitive concerns. *Q.M.J.I.P.*, 3(1), p.16, note 79.

²³³ German federal Supreme Court, *Standard Tight-Head Drum (Standard-Spundfass)*, 36 IIC No.6 (2005), 747.

5.3. Patent licensing in the patent thicket

5.3.1. Patent pool and cross-licensing

The ability of patents to stimulate innovation comes with the adverse effect associated with hold-up problems. This crisis is even more serious in the patent thickets where innovators have to hack their way through multiple patents. In addition to the licensing regimes imposed on SEPs and patent holders, which is essential to the market, there are also other strategies to make essential patents accessible to others. This particularly applies where multiple patent holders may hold complementary patents and block a potential product from gaining access.

When two companies own patents that need to be applied to each other's products, a cross-license can ensure access to these patented works. Rather than risking patent infringement and the burden of litigation, the two parties can negotiate acceptable royalties on cross-licensing patents or even agree a royalty-free arrangement.²³⁴ Both parties are free to compete without worrying that high royalty rates will be extracted from each unit they sell. Cross-licensing is normally believed to be pro-competitive.

On the other hand, if two or more companies own patents that are essential to produce a product while the actual or potential producers do not hold any of them, a joint patent licensing programme may be launched and the companies can license their patents as a package to other members in the pool or any third party who is willing to pay to access the patents.²³⁵ Licensing all the patents in the patent pool can

²³⁴ SHAPIRO, Carl (2001). Navigating the patent thicket: Cross-licenses, patent pools, and standard-setting. *Innovation Policy and Economy*, Volume 1. p. 9.

²³⁵ *Ibid.*, pp. 9-10.

contribute to the acquisition of complementary patents and ease licensees' burden, since they only need to engage in one-stop shopping to access the patents they need, which is welcomed in a patent thicket environment.

5.3.2. Cooperation in the smartphone industry?

Both cross-licensing and patent pools are constructive strategies to circulate patents, since they not only expedite horizontal cooperation among patent holders in an industry, but also accommodate licensees. Since the cost of paying for two or more separate patent licenses is considerably higher than the charge for obtaining them all at once, this helps to reduce possible royalty stacking that accumulates with numerous royalty charges. In addition, a patent can be used more effectively if it has to be applied with another patent included in the same license agreement to demonstrate its function.

However, there is a perception that patent pools are likely to reduce innovation, and this is especially true when the patent in the pool is essential to industry. Although they can be used to help establish compatibility standards, there is still a risk that they may block the entry of other alternative technologies.²³⁶ Such essential patents are generally complementary, and it is necessary for the technology that the pool is firmly based and therefore should not be held by anyone within or outside the pool. According to the agreement, members of the pool are entitled to obtain royalties in return; therefore, they may not be inclined to license their patents outside the pool. This will block inventors who have not joined the pool, thereby restraining their innovative activities.

²³⁶ LANG, John Temple (2011). Patent pool and agreements on standard. *E.L.Rev.*, 36(6). pp. 887-888.

Cross-licensing and patent pools are moderate strategies to reduce the damage of patent hold-up. They preserve the patent holder's reward and exclusivity and make useful information available to licensees. Both licensors and licensees of pooled patents are voluntary participants in the licensing agreement with a satisfactory amount of royalty. This is certain to encourage potential inventors and has a positive effect on innovation; yet, one of the very first premises to be met is that patent holders want to join the pool, accept the terms and conditions, and are willing to divide the proceeds with other holders, and in some cases, this may be hard to achieve.

Some patent holders such as non-practicing entities do not utilise their patents but simply benefit from them by demanding high royalties. Since they do not actually apply them to new or advanced innovations, there is no point in cross-licensing with other patent holders or joining a patent pool and sharing the revenue with other participants. Moreover, patents are sometimes regarded as being a means to exclude competitors' products so that the holding company can expand its market share, and these patent holders may not intend to license their patent. Even if they do, another potential danger is a consortium consisting of patent holders of leading technologies, since this forms an even stronger barrier to accessing patents based on the essential patents they own. Thus, patent pools and cross-licensing be of limited assistance in facilitating the circulation of patents. An example of this is the consortium "Rockstar", which comprised many famous companies and which acquired a large portfolio from the bankrupted company, Nortel. Rockstar alleged that the operating system of Google infringed the myriad patents it had obtained from the auction, thus

substantially raising the costs of Google and its Android partners.²³⁷

Furthermore, hardware and software suppliers may have diverse specialities in industries like the smartphone industry. Microsoft owns remarkable patent portfolios in the field of software and Apple focuses on user interface, while other companies may hold essential patents in the field of wireless telecommunication. Since the respective patents held by each company do not apply to other's technology, it is hard to envisage that they would be attracted by other's patents and license their own patents in order to access those of others.²³⁸

5.3.3. Essential facilities doctrine in exceptional circumstances

The TRIPS Agreement instructs its WTO Members that limited exceptions can be made to a patentee's exclusive right when third parties' legitimate interests are taken into account as long as this does not unreasonably conflict or prejudice the patent holder's legitimate interests.²³⁹ In Europe, the ECJ clarified in early case law that an obligation imposed on IP right holders to license their right, even in return for a reasonable royalty, would demean the substance of the right holder's exclusivity; thus, a refusal to license could not be deemed as being an abuse of a dominant position. However, the court also noted that the exercise of an exclusive right may be prohibited by the EC Treaty.²⁴⁰ In the following meaningful cases, the European court

²³⁷ LANE, Matthew Cameron (2013). Patent wars: How the government can best address anticompetitive patent accumulation by updating the Horizontal Merger Guidelines. Available from SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2225990, p.13; Last accessed 9th February 2014.

²³⁸ MAIER, Timothy J. (2011). Diving into the patent pool. *Intellectual Property Magazine*. Available from: <http://www.maierandmaier.com/documents/Timothy-J-Maier-IPM-October-2011-Diving-Into-the-Patent-Pool.pdf>. Last accessed 27th February 2014.

²³⁹ Article 30 of the TRIPS Agreement.

²⁴⁰ *AB Volvo* [1988] E.C.R. 6211. Paras 8 and 9.

acknowledged that intellectual property should be made available to specific third parties in exceptional circumstances.

Two decades ago, in the *Magill* case, the ECJ confirmed the concept that IP right holders' refusal to license their right does not in itself constitute anti-competitive conduct, and this concept applies even if the right holder is in a dominant position.²⁴¹ As mentioned in Chapter 3, in this case, the ECJ also established an exceptional circumstances test to consider if a right holder should be regarded as having abused his dominant position. Ten years later in the case of *IMS Health*, the ECJ confirmed the exceptional circumstances test and further elucidated that three cumulative conditions should be satisfied to determine if IP right holders' refusal to grant a license to give access to work that is indispensable for continuing a business, constitutes abusive conduct. The conditions were concluded that, if the refusal prevented the emergence of a new product for which there is a potential consumer demand, the refusal is objectively unjustified.²⁴² The court also emphasised that refusal to license can be classified as abusive conduct if it leads to the competition in the downstream market being eliminated.

Although these cases did not particularly refer to patent disputes, they paint a clearer picture of the exception of IP protection, especially the right of exclusivity granted by IP law. In *Magill* and *IMS Health*, the ECJ stressed that products that require access to IP rights should be "new" to constitute abuse of a dominant position if the right holders refuse to issue a license. Namely, they argued that right holders' exclusivity should be excluded if the product was not provided by IP right

²⁴¹ *Magill* [1995] E.C.R.I. I-743. Paras 46- 49.

²⁴² *IMS Health v NDC* (C-418/01)[2004]E.C.R. I-5039. Paragraph 38.

holders and there was a consumer demand in the downstream market.²⁴³ This concept was initially applied to tangible rights and required a dominant firm who controlled the essential facilities to which a licensee needed access to provide a new product.²⁴⁴ This essential facilities doctrine is now applied, at least in some European courts, to justify a legitimate exception to an IP right.

The essential facilities doctrine is useful in cases where the public interest protected by ensuring competition is outweighed by the private right granted by IP. However, in the ICT sector, where interoperability is significant for innovation, the Court of First Instance in the EU (the “CFI”, now the “General Court”) advocated the application of the doctrine established by the ECJ in an appellate case only if it employed a lower standard to examine the four criteria for intellectual property licensing.

In the case of *Microsoft*, Microsoft’s PC operating system had become standard in the industry because of its high market share, and its competitor, Sun Microsystems, asked to access Microsoft’s workgroup server information to make its product interoperable in the market. Microsoft refused and Sun Microsystems complained to the Commission.²⁴⁵ The Commission ruled that Microsoft had abused its dominant position and imposed the highest fine ever recorded at the time on Microsoft.²⁴⁶ This case was appealed to the CFI where the Commission’s decision was upheld and it was confirmed that the interoperability information was indispensable under the

²⁴³ *Ibid*, at paragraph 49.

²⁴⁴ ZHANG, Liguang (2010). Refusal to license intellectual property rights under article 82 EC in light of the standardisation context. *E.I.P.R.*, 32(8). p. 408.

²⁴⁵ European Commission, COMP/C-3/37.792 *Microsoft* [2004] OJ L32/23.

²⁴⁶ GRAEF, Inge (2011). Tailoring the essential facilities doctrine to the IT sector: compulsory licensing of the intellectual property rights after *Microsoft*. *C.S.L.R.*, 7(1), pp. 6-7.

essential facilities doctrine in this case.²⁴⁷

The CFI indicated that Article 82 of the EC Treaty does not apply only from the time when there is no competition in the market;²⁴⁸ it applies when the refusal of the license is liable or likely to eliminate the competition. The CFI confirmed that the doctrine established in earlier cases should be taken into account; however, it also clarified that all the circumstances of the refusal in the case should be considered because not all circumstances will be the same as in earlier cases. Furthermore, in *Microsoft*, the CFI also pointed out that the “new product” criterion cannot merely be established from the judgment or prejudice of consumers under the EC Treaty.²⁴⁹ In this case, the refusal of the license would force consumers to be locked into Microsoft’s product because its competitor was not able to provide an interoperable product, thus limiting consumers’ choice.²⁵⁰

The CFI’s reasoning for upholding the case was persuasive, since it considered the special nature of the case. The ICT industry creates the environment for a networked effect; therefore, Microsoft would increase the entry barrier to its competitors if it failed to make the interoperability information available to them. The strict explanation of the essential facilities doctrine may be appropriate in other cases; however, the lenient application applied in the *Microsoft* case was fair and reasonable in the specific circumstances of the ICT industry. The essential facilities doctrine may be welcomed by competitors who seek access to essential technology, but it is controversial in terms of economic growth and strict IP protection because it

²⁴⁷ *Microsoft v Commission* (T-201/04) [2007] E.C.R. II-3601.

²⁴⁸ *Ibid.* Para 561.

²⁴⁹ Article 82 (b) of the EC Treaty which equivalent to Article 102 of the TFEU.

²⁵⁰ *Microsoft v Commission* (T-201/04) [2007] E.C.R. II-3601. Paras 650- 652.

contravenes the exclusive right awarded to patent holders, which is deemed to encourage innovation.

5.3.4. Summary

5.3.4.1. Adverse opinions on the doctrine

Compared to the EU court, the essential facilities doctrine has never been expressly recognised in the US to justify the refusal to supply essential patents; nor has compulsory licensing, which is the implementation of the doctrine, been adopted as a remedy in such cases in the public interest. It is found that a company's unilateral refusal to license can hardly constitute the basis of liability in the US courts because the right to exclude others is at the heart of IP rights.²⁵¹ The US court establishes more stringent requirements for injunction relief, as demonstrated in the *eBay* case in Chapter 4, to address the accessibility of necessary patents of other users. The doctrine is more accepted in Europe than in the US, albeit the US Supreme Court did apply certain theories analogous to the doctrine to address the elements when determining the liability of refusal to supply essential facilities.²⁵²

The adverse opinions of the doctrine are normally based on reasons of investment incentives. In the US, the DOJ and FTC clarify that the market power of the IP holder does not impose an obligation to license the use of IP to others.²⁵³ As for the EU, in

²⁵¹ YU, Qiang (2014). Software interoperability information disclosure and competition law. *E.C.L.R.*, 35(3), p.240.

²⁵² *MCI communications v AT&T*, 708 F.2d 1081 (7th Cir.1983). 464 US 891 (1983).

²⁵³ U.S. Department of Justice and the Federal Trade Commission (1995). Antitrust Guidelines for the Licensing of Intellectual Property, p. 4. Available at: <http://www.ftc.gov/sites/default/files/attachments/competition-policy-guidance/0558.pdf>.

the *Bronner* case the court made a statement that followed the same viewpoint that “... the mere fact that by retaining a facility for its own use a dominant undertaking retains an advantage over a competitor cannot justify require access to it.”²⁵⁴ The essential facilities doctrine apparently goes against these concepts and has an adverse impact. Although the subject matter in the *Bronner* decision in Europe concerned tangible assets, the court indicated a stricter justification for the application of the doctrine. The market elimination and objectively justified requirement in the previous *Magill* case seemed not to be sufficient since it merely showed the inconvenience of duplicating the facility. According to the court, the threshold to the essentiality of a facility can only be demonstrated when the facility is “indispensable” to carry on the potential licensee’s business for which there is no substitute in the market.²⁵⁵

5.3.4.2. Licensing regime in patent protection

In the emerging technology business, innovative goods normally compete with existing innovations, and substitutive and competitive products are stimulated to be introduced in this way and thereby promote the dynamic efficiency of the development and economic growth of this industry. Examples of this phenomenon normally exist in industries like mobile phone operating systems and web browser software.²⁵⁶ It is true that depriving the exclusive right to a patent will reduce this dynamic efficiency due to the lack of incentive to both monopolists and competitors

²⁵⁴ *Oscar Bronner GmbH & Co KGV Mediaprint Zeitungs und Zeitschriftenverlag GmbH & Co KG* (C7/97) [1998] E.C.R. I-7791; [1999] 4 C.M.L.R. 122. Cited from CHOI, Jay Pil (2010). Compulsory licensing as an antitrust remedy. *W.I.P.O.J.*, 2(1), p78.

²⁵⁵ *Ibid.*, at paragraph 41.

²⁵⁶ YU, Qiang (2014). Software interoperability information disclosure and competition law. *E.C.L.R.*, 35(3), p.238.

to invest in innovation. However, it has always been a scabrous task to strike the balance between ex-post competition and ex-ante investment incentives, and it seems that there is not yet a scheme that satisfies both aspects, or indeed ever will be. At this stage, mandatory access to essential patents with reasonable compensation to holders is the regime that brings less obstruction to patent exclusivity and is the best possible way to be applied in practice.

The best rate of compensation to patent holders in compulsory licensing is a task for antitrust authorities and is thus not the concern of patent law. The essential question to be considered here is how to minimise the risks that accompany compulsory access to the patents. Since the absence of generally agreed decisive elements to the essential facilities doctrine remains, the priority is to employ cautious scrutiny of the doctrine for sure. The court in the aforementioned *Microsoft* case is deemed to have demonstrated a good example of construing the doctrine based on the particular facts of the case.²⁵⁷ This may be an optimal way to apply the doctrine when its explanations are not completely certain but it has been applied to decide the threshold of competitive intervention. This theory not only reduces innovative incentives, but it also creates uncertainty to patent holders, since it is hard to predict when and how they will be deemed to have abused their dominant position. Hence, the application of the essential facilities doctrine should, in principle, be strictly justified in order to preserve the exclusivity of patents.

The implementation of this doctrine, which is normally presented in compulsory licensing, will be discussed in the Chapter 7.

²⁵⁷ GRAEF, Inge (2011). Tailoring the essential facilities doctrine to the IT sector: compulsory licensing of the intellectual property rights after *Microsoft*. *C.S.L.R.*, 7(1), p. 9.

What is the current state of patent law and competition law in practice?

6.1. Introduction

The practical approaches of patent law are observed in this chapter in conjunction with competition law in the EU and US. The chapter begins with an analysis of the US patent system with two famous cases as examples, which demonstrate how patent ambush is measured in the ICT industry. Next, it moves on to the EU patent system and the recently-adopted unitary patent system.

Smartphone provides the communication functions of traditional mobile phones and the data processing functions of computers. Two cases given here are related to the data process technologies (the *Rambus* case) and wireless telecommunication technologies (the *Qualcomm* case) that can be deployed on smartphone. The approaches to the two cases are analysed to determine how the abuse hardware and communication technology patents were ruled to identify the most urgent task for both EU and US anticompetitive authorities.

Finally, whether or not the major smartphone companies' aggregation of patents can enhance the development of the smartphone industry is discussed by referring to the investigation in the EU and US of the conspicuous merger between Google and Motorola.

6.2. US dimension

The exercise of exclusive right is especially contentious when the patent is SEP. For

the same reason, a misleading standardisation process can be deemed as harming competition, since it disturbs the determination of an SSO and distorts the best standard that can be applied to the market. This creates the potential danger of turning the standardisation of technology into a tactical approach to collect bargaining power.

6.2.1 Rambus case in the US

The Federal Trade Commission (hereafter the “FTC”) in the US has made a significant decision in a series of suits concerning the acquisition of bargaining power by concealing patent information during standard-setting proceedings. In the case of *Rambus*²⁵⁸, the company, which owns the patent of reduce electronic memory’s impact on process speed, failed to disclose its IP holdings in accordance with the policy of the SSO, the Joint Electronic Device Engineering Council (“the JEDEC”), as it was required to do. Rambus revealed its patent after its patents were adopted as standard in dynamic random access memory (known as “DRAM”) products. It then asserted its patents against manufacturers who applied its technologies in DRAM and chipsets; however, the JEDEC and its members believed that the technologies should be in the public domain.

According to the FTC, the failure of Rambus to reveal its patent in good time enabled it to charge supra-competitive royalty rates because users were locked into its technologies, which had been selected as standard. Therefore, the FTC concluded that Rambus’s conduct violated the prevention of monopolisation in the Sherman Act

²⁵⁸ Docket No. 9302. Cited from [Online] Available from: <http://www.ftc.gov/news-events/press-releases/2006/08/ftc-finds-rambus-unlawfully-obtained-monopoly-power>. Last accessed 6th December 2013.

and the prohibition of unfair methods or deceptive acts or practices that affect commerce expressed in the FTC Act.²⁵⁹ The Commission reasoned that, had Rambus not concealed the patent, it would have had to compete with other rival technologies and would thus have offered reasonable rates when negotiating the license with users. Likewise, the JEDEC would have chosen other technologies as standard if it had been aware of the existence of Rambus's patent.

The Court of Appeal for the D.C. Circuit rejected the FTC's decision in 2008.²⁶⁰ It reversed the FTC's opinion and held that the failure of Rambus to disclose the patent information did not constitute anti-competitive conduct. The FTC failed to prove that the JEDEC would have chosen to standardise other technologies to replace those of Rambus if it had known about the patent. For this reason, the court viewed this price-increasing conduct as being within the scope of the lawful practice of the monopoly right granted by the patent, even if it enabled Rambus to acquire higher license fees.²⁶¹

The judgment of the appellate court in the *Rambus* case was obviously contrary to the precedent established by the Third Circuit in a prior case of *Broadcom Corp. vs. Qualcomm Inc.*, which was brought slightly earlier than the appellate court's decision.

6.2.2. *Broadcom Corp. v. Qualcomm Inc.* in the US

Qualcomm is a US chipset manufacturer that owns patents related to 3G

²⁵⁹ According to the FTC, Rambus's conduct constituted exclusionary conduct in Section 2 of the Sherman Act and Section 5 of the FTC Act (Also known as Title 15 US Code section 45).

²⁶⁰ *Rambus, Inc. v. FTC*, 522 F.3d 456 (D.C. Cir. 2008).

²⁶¹ *Ibid.*, at paragraphs 464-465.

telecommunication technologies, some of which have been standardised in the ETSI. Broadcom asserted that Qualcomm sought to monopolise the market of wideband code division multiple access (known as "WCDMA") for mobile telephony, which is a kind of cellular network that forms an air interface standard in the 3G mobile telecommunication network, of which it holds the patent. Broadcom alleged that Qualcomm induced the ETSI to adopt its patented technologies as some of the UMTS standards by making a commitment to license its patent on FRAND terms; it then demanded discriminatory royalties from users who did not use the its chipset.²⁶²

Although the District Court held that Qualcomm had lawfully excluded competition in virtue of the monopoly awarded by the patent, the case was appealed to the Third Circuit Court of Appeal and reversed in 2007.²⁶³ The appellate court referred to the FTC's decision in the *Rambus* case and upheld the patent holder's inducement by promising to license his patents on FRAND conditions in standardising proceedings; however, it found that its breach of the commitment after being adopted as standard was actionable anti-competitive conduct. The court estimated that Qualcomm had breached the Sherman Act and remanded the case to the District Court for further proceedings.

6.2.3. Discussion

The Court of Appeal's decision in *Rambus* provided several concepts, one of which worth considering most is the interface between a patent and antitrust protection. The court's determination was based on the idea that Rambus's deceptive conduct did not make it immune to market competition; although it deprived members'

²⁶² US D.C. Civil No.3:05-cv-03350.

²⁶³ *Broadcom Corp. v. Qualcomm Inc.*, 501 F.3d 297 (3d Cir 2007).

chances to negotiate licensing terms at the pre-competitive stage, it was not detrimental to the competitive process. Besides, price-increasing conduct in this case was regarded as a concomitant of monopolistic power granted by the patent, which is approved by antitrust regulations. Despite not being expressly defined, it can be assumed from the decision that, according to the court, antitrust interference should be minimised in the patent system.²⁶⁴

It seems that the Appeal Court's consideration is beneficial for patent holders and acts as an inducement to attract potential inventors in the US. However, it is necessary for US antitrust law to interfere in the case of Rambus's deceptive conduct concerning the adoption of a standard in order to facilitate efficient standard-setting and increase the competitiveness of most of the providers of the same product. The Appeal Court overlooked the competitive environment in this case, in which Rambus's patent was the SEP and industry members are locked in it. Even if there was no evidence that the SSO would choose another technology if it was conscious of Rambus's patent, it was evident that adopting its patent would be considerably detrimental to members' chance to negotiate a licensing price.

6.3. European dimension

6.3.1. Milestone progress of a unitary patent in Europe

Rather than collecting a bundle of patents from these countries to ensure that patents are enforceable in the whole of Europe, two remarkable draft regulations

²⁶⁴ CHRONOPOULOS, Apostolos (2009). Patent Standards – a case for US antitrust law or a call for recognizing immanent public policy limitations to the exploitation rights conferred by the Patent Act? *ICC*, 40(7), pp. 789-790.

and an agreement regarding an EU patent package were adopted by the European Parliament in December, 2012, in relation to a unitary patent and Unified Patent Court (hereafter the “UPC”) in the European patent system.²⁶⁵ A unitary patent is a European patent “granted by the EPO under the rules and procedure of the European Patent Convention upon the request of the patent proprietor....”²⁶⁶ This significant breakthrough makes it possible to acquire patent protection in 26 EU MSs by means of one simple administrative step.²⁶⁷

One of the aforementioned regulations is for the purpose of creating an instrument of the implementation of unitary patent protection²⁶⁸, while the other relates to the application of the language regime of the unitary patent.²⁶⁹ Both of these regulations came into force in January, 2013. As for the Unified Patent Court, this will be established on the basis of an international treaty, the Agreement on Unified Patent Court. The agreement was signed in February, 2013 and will be adopted as soon as it has been ratified by more than 13 contracting states including Germany, France, and the UK.²⁷⁰ The two regulations will be applicable after the agreement enters into force.²⁷¹ If a question arises regarding Union law, the Unified Patent Court will follow

²⁶⁵ EPC (2012). European Patent Office welcomes historic agreement on unitary patent. [Online] Available from: <http://www.epo.org/news-issues/news/2012/20121211.html>. Last accessed 29 September 2013.

²⁶⁶ EPC. What is the unitary patent? [Online] Available from: <http://www.epo.org/law-practice/unitary/faq.html#faq-630>. Last accessed 19 October 2013.

²⁶⁷ The unitary patent is effective throughout the EU except Spain and Italy due to a disagreement about the language used.

²⁶⁸ Regulation (EU) No. 1257/2012 of the European Parliament and of the Council of 17 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection [2012] OJ L361/1.

²⁶⁹ Council Implementing Regulation (EU) No. 1260/2012 of 17 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection with regard to the applicable translation arrangements, 2012 OJ L361.

²⁷⁰ EPC. Agreement on a Unified Patent Court 2013. [Online] Available from: <http://www.epo.org/law-practice/unitary/faq.html#faq-630>. Last accessed 19 October 2013.

²⁷¹ EPC. When will the “patent package” enter into force? [Online] Available from:

the example of the national courts of the EU, namely refer it to the CJEU for a preliminary ruling.²⁷²

6.3.2. Merits and demerits of the unitary patent in Europe

The implementation of a unitary patent system means that a transnational patent application can be filed in any language of the MSs, although a translated version in the official languages of the EPO, namely English, French, and German, needs to be filed if the application is not in any one of these official languages. The unitary patent system limits the cost of translation and validation and considerably reduces it from 36,000 to approximately 5,000 Euros.²⁷³ Moreover, a proposed computer-generated translation enables applicants to translate online free of charge.²⁷⁴ When the machine translation covers all the EU official languages and several non-EU languages, the translation of a patent application will take less time and be less of a financial burden.

Indeed, the unitary patent system makes European member countries an indivisible entity and validates the exclusive right in this single territory. It also enables the aggregation of complex infringements based on one intention. It is valuable for cases in which a single infringer commits the same infringement in more than one European country, or a supranational patent infringement which is constituted by

<http://www.epo.org/service-support/faq/procedure-law/faq.html#faq-635>. Last accessed on 13 April 2014.

²⁷² EPC. What are the main features of the Unified Patent Court?[Online] Available from: <http://www.epo.org/law-practice/unitary/faq.html#faq-636>. Last accessed 19 October 2013.

²⁷³ European Commission. What is the “unitary patent package?”[Online] Available from: http://ec.europa.eu/internal_market/indprop/patent/faqs/index_en.htm#maincontentSec1. Last accessed 20 October 2013.

²⁷⁴ WEST, Alexandra et al. (2013). Unitary patents and the Unified Patent Court. *C.T.L.R.*, 19(4), p.107. Also see [Online] Available from: <http://www.epo.org/searching/free/patent-translate.html>. Last accessed 27 October 2013.

cross-border contributory infringement.²⁷⁵ This decreases the possibility of contradictory decisions being made by different national courts, as well as assuring patent holders' competitors and defendants of legal certainty in patent cases because of the existence of a unitary patent and a unified patent court.

Since EU Member MSs are commercially and politically integrated, a uniform community patent is deemed to be essential for the benefit of the internal market.²⁷⁶

The lack of a unitary patent protection not only lessens inventors' willingness to publish useful information, but also prevents market participants from utilising valuable knowledge; thus, it is detrimental to the transfer of information in the internal market. A unitary patent system more efficiently fosters innovation than the intricate process of having to obtain a bundle of European patents.

The high cost of patent litigation deterred many potential inventors in the past, especially when the invention could possibly be distributed geographically. This new system is particularly advantageous for individual inventors, SMEs, and start-up companies that have much less funding than large businesses like Apple, Google and Samsung. In the future, the unitary patent and its exclusive court will create a friendlier environment for research and market participation. It can also contribute to the incentives to innovative activities in the Europe and further foster the competitiveness of the internal market against Asia and the US.²⁷⁷

²⁷⁵ ROMANDINI, Roberto and KLICZNIK, Alexander (2013). The territoriality principle and the transnational use of patented inventions – the wider reach of a unitary patent and the role of the CJEU. *IIC*, 44(5), p.532.

²⁷⁶ SCHADE, Jurgen (2010). Is the Community (EU) patent behind the times? Globalisation urges multilateral cooperation. *IIC*, 41(7), pp. 810-811.

²⁷⁷ EPC (2012). European Patent Office welcomes historic agreement on unitary patent. [Online] Available from: <http://www.epo.org/news-issues/news/2012/20121211.html>. Last accessed 29 September 2013.

With regard to ICT sector, the influence of a unitary patent system is a huge step forward. By their nature, telecommunication innovations are not only applied to a sole device like a single computer or mobile phone; rather they are usually implemented in a network of domestic and transnational devices, in which the standardisation of a technology is the key mechanism to ensure their interoperability and compatibility. The utilisation becomes even harder to control when these devices are connected to the internet. The server of an invention circulation can be located in any place and provide the innovation to numerous clients.²⁷⁸ If the patent is infringed, the patent holder has to lodge a claim in various national courts with the risk of inconsistent jurisdiction and decisions. Since the application of such technology is growing substantially, the European patent regime can be regarded as facilitating the practice of telecommunication inventions in the EU.

However, there may be some doubt as to whether the unitary patent system is as comprehensive as it was proposed to be. Here it will focus on the possible negative impacts in the smartphone industry.

Firstly, the lower expenditure scheme in the system may not be deemed to be attractive to some inventors. Some patent holders may rather look for a bundle of patents from the national courts and enforce them in the designated nations to maximise their benefits.²⁷⁹ For example, statistics show that very few SMEs would

²⁷⁸ ROMANDINI, Roberto and KLICZNIK, Alexander (2013). The territoriality principle and transnational use of patented inventions – the wider reach of a unitary patent and the role of the CJEU. *IIC*, 44(5), p. 527 and p. 539.

²⁷⁹ WEST, Alexandra et al. (2013). Unitary patents and the Unified Patent Court. *C.T.L.R.*, 19(4), p.107.

ask for patent protection in all EU MSs.²⁸⁰ Unlike large corporations, the majority of whose business is international; SMEs normally have patent disputes at the national level. A unified Patent Court would require them to pursue legal actions abroad, and those who are not able to speak one of the three official languages adopted in the unitary system, would have to translate their claims. In this regard, the new system does not considerably reduce the cost of patent litigation, as it is assumed.²⁸¹ Rather SMEs would face more financial difficulties if they have patent disputes against large corporations.

Next, patent protection ensures that patentees can expand their business at a national and international level. However, the patent activities may vary in each MS in the EU due to the different industrial ecosystems and economic activities. Economic policies in an individual MS are vital to achieving the patent's aim. Since the EPO and the UPC have the exclusive competence to determine patentability and patent litigation respectively, their decisions have a unitary effect in all MSs, The unitary system deprives national courts and legislators of the opportunity to recognise the needs of industries in their national market and make the optimal adjustment to their economic policies.²⁸² This would lead to patents being determined by the legal standards and principles of the Unified Patent Court without taking account of national states and their people's needs, albeit that they are the ones who will be directly affected by the Court's decision.

Furthermore, since patentees are able to practice their patent under a single

²⁸⁰ XENOS, Dimitris (2013). The European Unified Patent Court: Assessment and implication of the federalisation of the patent system in Europe. *SCRIPTed*, 10:2, p273.

²⁸¹ *Ibid.*, at pp. 273- 274.

²⁸² *Ibid.*, at, pp. 246-247 and pp. 253-254.

enforcement and the results have an EU-wide effect, it creates risks to patent holders and unwitting infringers. The adverse impact of a unitary system can be observed when plaintiffs are non-practicing entities. It would enable them to acquire an EU-wide decision by a single action and thus they would have an even stronger bargaining position in royalty negotiations. Also, patentee's competitors or other third parties can also ask for patent revocation without the need to take so many irritating steps and incur high costs; therefore, their patents will become invalid in pan-European territory because based on one court's decision.²⁸³ This especially disadvantages patentees if revocation is filed for the purposes of crippling their competitiveness. What is more, a unitary system would also enable opportunistic plaintiffs to do forum shopping; namely, they would be able to choose to file litigation in whatever court would be most sympathetic to their interests.

According to the aforementioned facts, it is fair to say that a unitary patent should be welcomed in the EU; however, whether it will actually bring as many benefits as the European Union predicts remains to be seen.

6.3.3. European Commission's Investigations of patent ambush

While some significant complaints in *Rambus* and *Qualcomm* have been investigated in the by the US FTC and the Federal Court of Appeal, the European Commission has also considered the same cases, and the solutions from the two continents have sometimes been dissimilar despite being based on the same facts. The following analysis of the EU's investigation of these cases will reveal the different considerations in the EU and US.

²⁸³ WEST, Alexandra et al. (2013). Unitary patents and the Unified Patent Court. *C.T.L.R.*, 19(4), p107.

6.3.3.1. The *Rambus* case in the EU

As mentioned earlier, the US DRAM developer, Rambus, withheld its patent information during the standard-setting proceedings in the JEDEC and charged royalties for using its patented technologies. Two of the DRAM manufacturers in the case filed the same complaint with the European Commission, which is the European antitrust authority in the case of ambush in the EU, several months after the FTC's complaint against Rambus's conduct in the US.

The Commission alleged that Rambus had abused its dominant position, as stipulated in Article 102 of the TFEU.²⁸⁴ Different from the US antitrust law, the *actus reus* of Article 102 is objective and the actor's intent does not have to be proven.²⁸⁵

The wording in the provision indicates that the EU competitive law prohibits the abuse of a dominant position. Since using the anticompetitive instrument to obtain market power does not breach the provision, the Commission did not make its conclusion by accusing Rambus of intentionally not disclosing its patent and patent application during the standardisation process in the JEDEC; rather, it indicated that Rambus had abused its dominant position because it asked for unreasonable royalties after it acquired the dominant position through its deceptive conduct.

Unlike the US approach, which prohibits monopoly or attempts to monopolise, the TFEU in the EU considers the abuse of a dominant position. The Commission

²⁸⁴ European Commission, COMP/38.636, December 9, 2009.

²⁸⁵ SCHREPEL, Thibault (2013). Patent troll through the US and EU antitrust law: when co-operation is no longer an option. *E.C.L.R.*, 34(6), p.323.

prudentially considered Rambus's manipulating conduct in the standard-setting process and charged excessive fees, contrary to the TFEU. In this regard, the Commission made a statement of objections against Rambus in 2007.²⁸⁶ However, when Rambus made a commitment to cap the maximum royalty rates of future products that applied the JEDEC standards, the Commission closed the investigation in 2009.

It is regrettable that the Commission failed to provide guidance on consistent SEPs licensing principles since the case ended up with a settlement.²⁸⁷

6.3.3.2. The *Qualcomm* case in the EU

Qualcomm also faced the complaint in the European Commission of inducing the ETSI to adopt its technologies as WCDMA standards for mobile telephony by making a false commitment in the US. This was lodged by six firms in the mobile phone equipment market, namely Ericsson, Nokia, Texas Instruments, Broadcom, NEC and Panasonic. The Commission initiated formal proceedings for in-depth investigation in 2007.²⁸⁸

²⁸⁶ European Commission (2007), Antitrust: Commission confirms sending a Statement of objection to Rambus. MEMO/07/330. Available from: [http://europa.eu/rapid/press-release MEMO-07-330_en.htm](http://europa.eu/rapid/press-release_MEMO-07-330_en.htm). Last accessed 07 December 2013.

²⁸⁷ GERADIN, Damien (2013). The years of DG competition effort to provide Guidance on the application of competition rules to the licensing of standard-essential patent: Where do we stand? p. 8. [online] Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2204359. Last accessed on 15 November 2013.

²⁸⁸ European Commission (2007), Antitrust: Communication initiates formal proceedings against Qualcomm. MEMO/07/389. Available from: [http://europa.eu/rapid/press-release MEMO-07-389_en.htm](http://europa.eu/rapid/press-release_MEMO-07-389_en.htm). Last accessed 10 December 2013.

In this case, Qualcomm's patent was essential for the WCDMA standard. The complainants alleged that the terms and conditions for licensing the standards imposed by Qualcomm breached the FRAND commitment and thus violated Article 82 of the EC Treaty. According to the allegation, this could result in higher prices of mobile handsets, which would be detrimental to consumers, hamper the standardisation process, and eventually impede the economic efficiency of the mobile telecommunication market.

This case demonstrates the lack of criteria for inspecting the royalty rates of a SEP to ascertain if they are fair and reasonable.²⁸⁹ When patent holders are accused of breaching the anticompetitive rules in the TFEU by charging excessive fees, the Commission faces the predicament of demonstrating that they have, in fact, breached this provision. Although the Commission committed time and resources to evaluating the evidence, it is regrettable that it did not take the opportunity to establish a proper assessment of the provision in time. The Commission closed these proceedings after a two-year thorough investigation without a chance to give indication on deciding royalty rates due to the withdrawal and intention to withdraw the complaints following commercial settlements reached with Qualcomm in 2009.²⁹⁰ Some of them withdrew the complaint to the EC due to a victory over

²⁸⁹ GERADIN, Damien (2013). The years of DG competition effort to provide Guidance on the application of competition rules to the licensing of standard-essential patent: Where do we stand? pp. 8-9. [online] Available from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2204359. Last accessed 12 December 2013.

²⁹⁰ European Commission (2009), Antitrust: Commission closes formal proceedings against Qualcomm. MEMO/09/516. Available from: http://europa.eu/rapid/press-release_MEMO-09-516_en.htm?locale=en. Last accessed 10 December 2013.

Qualcomm outside the EU (For example, Ericsson), while others did so based on the reason that they had reached a separate settlement against Qualcomm in the US (For example, Nokia and Broadcom).

6.3.3.3. Brief conclusion on the Commission's investigations

The Commission's investigations on both *Qualcomm* and *Rambus* were closed without giving a precise definition of how to meet FRAND licensing, albeit the Commission has been seen to be increasingly active in tackling anti-competitive conduct during the standard-setting process.²⁹¹ As mentioned in Chapter 5, the FRAND commitment is essential to the licensing of SEPs, since it ensures accessibility to SEPs and prevents an adverse impact the SEPs may have on competition.

It is undeniable that defining the licensing price for intellectual property is not an easy task. Unlike concrete assets, it is hard to establish an objective criterion to assess the value of a patent. These cases show the complex body of evidence that the Commission has to assess to verify the abuse of SEPs. The standardisation in the information and technology industry is undoubtedly the priority for the Commission to address the problem of abuse of SEPs; yet it is not appropriate for an antitrust authority like the Commission to be regarded as a rate-setting authority. Since an optimal licensing price should consider various industrial and economic elements; the Commission is short of certain expertise to consider a balanced interest among these demands.²⁹² This concept can be deemed to be affirmed by the General

²⁹¹ ROTONDO, Elisabetta (2012). European Commission initiates proceedings against Samsung for abuse of dominance by failing to license its standard-essential patents on fair, reasonable and non-discriminatory terms. *E.C.L.R.*, 33(8). p.348.

²⁹² GERADIN, Damien (2013). The years of DG competition effort to provide Guidance on the

Court, since it upheld the Commission's decision in the *Microsoft* case and did not oblige the Commission to make an indication of the calculation of FRAND licensing fees.²⁹³

It can be seen from the above that, as an antitrust authority, the Commission should provide principles for licensing SEPs to prevent patent ambush and exorbitant fees of such inventions and ensure compatibility in the market; namely, at this stage, it should clarify the definition of FRAND. Although the "safe harbour" test in the Horizontal Guidelines provides the condition that licensing agreements will not fall under the abuse of patents, the necessity of a FRAND definition remains to strengthen innovators' confidence in standard-setting and prevent SEP holders from unduly exercising extra exclusive power.

6.4. Google/Motorola Mobility merger case and FRAND licensing

A significant merger between two major companies in the ICT industry in 2011 attracted tremendous attention in both the EU and the US. Google announced its acquisition of Motorola Mobility, including approximately 17,000 issued patents and 6,800 pending applications.²⁹⁴ This acquisition was vital for the industry, since the patent portfolio related to wireless communication hardware and some of the

application of competition rules to the licensing of standard-essential patent: Where do we stand? p. 9. [online] Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2204359. Last accessed on 15 November 2013.

²⁹³ HOEHN Thomas and LEWIS Alex (2013). Interoperability remedies, FRAND licensing and innovation: a review of recent case law. *E.C.L.R.*, 34(2), p.111.

²⁹⁴ The United States Department of Justice (2012). Statement of the Department of Justice's Antitrust Division on its decision to close the investigation of Google Inc.'s acquisition of Motorola Mobility Holdings Inc. and the acquisition of certain patents by Apple Inc., Microsoft Corp. and Research in Motion Ltd.. Available from: <http://www.justice.gov/opa/pr/2012/February/12-at-210.html>. Last accessed 15 December 2013.

patents were even determined to be essential to standards in the industry.²⁹⁵ This raised the concern that, since Google owned a considerable number of patents after the acquisition, it could block its own competitors and those of Motorola from applying Google's Android software, thus controlling access to telecommunication standards which were its newly added patents.

Indeed, the patent portfolio seemed to be the most valuable acquisition in this transaction since it enabled Google to consolidate its position in the mobile market and enhanced its capacity to fight and win the patent battle. With the patents obtained from Motorola, a hardware manufacturer with a long history, Google was able to strengthen its competitiveness and restrain its rivals in the same market. Therefore, parallel investigations were launched in the EU and the US to determine if there had been any anticompetitive conduct that curbed the accessibility of Android software and SEPs in the smartphone industry after Google's acquisition of Motorola.

6.4.1. Investigation of the Google/Motorola transaction in the US and the EU

The US and EU investigations were both closed and the acquisition transaction was cleared by the European Commission and the US DOJ respectively in early 2012. It is worth noting that Google made a commitment to various SSOs to continue licensing Motorola's SEPs on FRAND terms and promised to recognise the royalty rates Motorola had prepared for its SEPs.²⁹⁶ In addition, it made a commitment to negotiate with potential licensees so that neither party would file legal proceedings

²⁹⁵ HOEHN Thomas and LEWIS Alex (2013). Interoperability remedies, FRAND licensing and innovation: a review of recent case law. *E.C.L.R.*, 34(2), p.101.

²⁹⁶ Case No COMP/M.6381-Google/Motorola Mobility (2012). Paragraph 9 (a) and (b).

Available from:

http://ec.europa.eu/competition/mergers/cases/decisions/m6381_20120213_20310_22774_80_EN.pdf. Last accessed 14 December 2013.

against the other's SEPs and seek injunctions by claiming their SEPs in a certain reasonable period. Even if the negotiation, which was based on good faith, failed, Google pledged that potential licensees would have a chance to prevent an injunction against their product if they offered to be licensed with Motorola's SEPs with certain conditions and provide securities for the payment of royalties.²⁹⁷

The EC considered that the transaction between the two companies did not have a horizontal or vertical effect on the market.²⁹⁸ It further pointed out that the acquisition was not likely to lead to a significant impediment, even if Google prevented Motorola's competitors from applying the Android operating system or offered them a degraded version.²⁹⁹ Meanwhile, the Commission was also aware of the possibility that Google could link Motorola's patents, which were essential to the wireless standard, with Android devices, which would constitute abusive behaviour. It warned that it would keep a close watch on relevant patent litigation.³⁰⁰

The DOJ's Antitrust Division in the US closed its investigation subsequent to the EC's scrutiny, since it closely cooperated with the EC when investigating the transaction between Google and Motorola. When considering if Google would use the patents it had acquired to raise competitors' costs or hinder competition, the Division finally concluded that it was unlikely to "substantially lessen competition" and "significantly change the existing market dynamics".³⁰¹ The Division took consumers into account

²⁹⁷ *Ibid.*, at paragraph 9 (c) and (d)

²⁹⁸ *Ibid.*, at paragraph 12 to 15.

²⁹⁹ *Ibid.*, at paragraph 95.

³⁰⁰ European Commission (Press release), 2012. Merger: Commission approve acquisition of Motorola Mobility by Google. IP/12/129. Available from: http://europa.eu/rapid/press-release_IP-12-129_en.htm. Last accessed 10 February 2014.

³⁰¹ The United States Department of Justice (2012). Statement of the Department of Justice's Antitrust Division on its decision to close its investigation of Google Inc.'s acquisition

and also considered the intricate issues within the intersection of intellectual property and antitrust protection. Despite closing its investigation of the acquisition, it stated its intention to continue to monitor Google's use of SEPs, which are especially important to the smartphone and tablet market and to take antitrust enforcement against any abuse.³⁰²

As an internet service giant, Google's core business is, in fact, online advertising rather than hardware manufacturing. With the development of Google's Android operating system, Motorola's patents enabled it to move from being software and design patent-orientated to a combination of communication technology patents. Some people described Google's acquisition of Motorola as a hardware client being acquired by a software client,³⁰³ which made Google more influential because of its ability to prevent competitors from entering the mobile handset market. A reasonable speculation of its conduct is that it attempted to attract more hardware manufacturers to employ an Android operating system, which provides services to facilitate users to get online. Since Android is the most prevalent open source, Google's online advertising business is enhanced, thereby creating substantial income.

Google's CEO, Larry Page, maintained that the acquisition had led to strengthening Google's patent portfolio, which increased competition and also protected Google

of Motorola Mobility Holdings Inc. and the acquisition of certain patents by Apple Inc., Microsoft Corp. and Research in Motion Ltd.. Available from: <http://www.justice.gov/opa/pr/2012/February/12-at-210.html>. Last accessed 15 December 2013.

³⁰² *Ibid.*

³⁰³ VARMA, Ashish (2012). Google's Motorola acquisition: A case study. *Viewpoint*, Volume 3, No.2., p.61.

and its original equipment manufacturer (hereafter the “OEM”) from being threatened by competitors in the market.³⁰⁴ Both Google and Motorola were carefully evaluated before the transaction. Google’s incentive was analysed earlier in this section; its FRAND commitment made to Motorola’s rivals and licensees seems to verify that the acquisition was not to foreclose the competition. However, according to the DOJ, its commitments were more ambiguous than those made by other major companies for licensing SEPs,³⁰⁵ including Microsoft and Apple, who pledged for a free injunction and FRAND patent licensing conditions. This seems to reveal that, although Google holds significant patent portfolios in the ICT industry, it remains scrupulous when making patent licensing commitments, thereby maintaining its superiority. Google’s statement does not provide its competitors with direct assurance concerning the exercise of newly-acquired patents; rather, it seems to allow Google room for excuses if it refuses to license Motorola’s patents or imposes inequitable licensing conditions.

6.4.2. Acquiring patents rather than engaging in inventive activities

Google’s acquisition of Mobility certainly provided its Android partners with a beacon of hope to ease any damage they may have incurred because of the fierce patent war, especially which caused by Android’s contenders against Android platform applicants. Reinforced by Motorola’s patents for telecommunication technology, Google’s patent portfolios enabled its partners to negotiate with other patent holders in the same

³⁰⁴ ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525, p. 525, note 2.

³⁰⁵ The United States Department of Justice (2012). Statement of the Department of Justice’s Antitrust Division on its decision to close its investigation of Google Inc.’s acquisition of Motorola Mobility Holdings Inc. and the acquisition of certain patents by Apple Inc., Microsoft Corp. and Research in Motion Ltd.. Available from: <http://www.justice.gov/opa/pr/2012/February/12-at-210.html>. Last accessed 15 December 2013.

market for cross-licensing and other collaboration based on equality and mutual benefits. Even if the OEMs who applied Google's operational system were accused of patent infringement, Google was able to provide assistance for their defence and thus mitigate the impact that may have been caused by patent litigation. Therefore, many of its Android partners welcomed this transaction.³⁰⁶

From the perspective of Android's competitors, such as Apple's iOS and Microsoft's Windows Phone, neither of which has an existing cross-license with Motorola, Google's declaration to use Motorola's patents to protect the Android ecosystem and enhance innovation is unconvincing. Microsoft doubted Google's assurance that it will not use the patents, especially the SEPs, to prevent others from utilising technologies that are essential to the industry for anticompetitive purposes.³⁰⁷ Despite Google being committed to fully abiding by Motorola's FRAND obligations, the Commission clarified in its decision that "a FRAND commitment cannot be considered as a guarantee that the SEP holder will not abuse its market power."³⁰⁸ Albeit the FRAND obligation can restrain their ability to abuse, the ability to engage in anticompetitive behaviour will not be constrained until it is ruled to have reached the extent of being anticompetitive by the relevant authorities. The risk remains because, for example, the SEP holders can threaten to seek an injunction or ask faithful competitors or potential licensees for onerous terms, or force non-SEP

³⁰⁶ Google. Google + Motorola: What people are saying. Available from:

<https://www.google.com/press/motorola/quotes/>. Last accessed 6 February 2014.

³⁰⁷ PARKHURST, Emily (2012). Microsoft, Apple take on Google. [Online] Available from:

<http://www.bizjournals.com/seattle/blog/techflash/2012/02/microsoft-apple-take-on-google.html?page=all>. Last accessed on 15 June 2014.

³⁰⁸ Case No COMP/M.6381-Google/Motorola Mobility (2012). Paragraph 113. Available from: http://ec.europa.eu/competition/mergers/cases/decisions/m6381_20120213_20310_22774_80_EN.pdf. Last accessed 14 December 2013.

holders to cross-license their patent.³⁰⁹ Therefore, anticompetitive behaviour by the dominant player can only not be conducted if competitors have power. This status quo foments the tendency of companies to scramble for a patent collection as a defence against anticompetitive conduct.

When the injunction has been issued, the faithful licensees' products will be excluded from the market and according to the Commission, this will eventually have a negative effect on consumers.³¹⁰ Another possible scenario is that, even if the licensee accepts the unreasonable licensing terms imposed by the SEP holder for the authorised use of the patents essential to its product, the increased production costs will be passed on to downstream manufacturers and even consumers. Given the argument that emerged in the case of the Google/Motorola merger, the Commission's decision indicated that there was a chance that SEP holders may abuse their patents, even when they have made a FRAND commitment.

In fact, the merger between Google and Motorola was not the first time a technology company looked for a tremendous patent portfolio to strengthen its market position. Six mobile phone manufacturers, including the famous Apple, Microsoft and Sony, formed a partnership called *Rockstar Bidco*.³¹¹ They won an auction early in the same year as Google's acquisition and obtained approximately 6,000 patents related to wireless and internet technologies from the bankrupt Nortel Networks Corp.³¹² The

³⁰⁹ *Ibid.*

³¹⁰ *Ibid.*, Paragraph 107.

³¹¹ The six consortium members are Apple, Microsoft, Sony, RIM, Ericsson (which is essentially the same company as Sony since they sold devices together previously)

³¹² The United States Department of Justice (2012). Statement of the Department of Justice's Antitrust Division on its decision to close its investigation of Google Inc.'s acquisition of Motorola Mobility Holdings Inc. and the acquisition of certain patents by Apple Inc., Microsoft Corp. and Research in Motion Ltd.. Available from:

companies in this alliance already had a number of patents of their own and the considerable number they acquired in the auction meant that Rockstar's patent portfolio covered many significant technical elements. Some of these are vital to smartphone features, such as data networking, and they also include the SEPs for the wireless devices industry, in which Nortel was committed to licensing SSOs members.

This fact made it more persuasive for the US DOJ to close the antitrust investigation into Google. Google's major competitors were companies that also provided operating systems for wireless devices, like the members of Rockstar. Compared to the large portfolios owned by Rockstar members, the 17,000 patents Motorola brought to Google were not likely to reduce the competition in the industry. This implies that if there is a big player in the market, competition law will allow smaller players to combine to provide a bulwark against its power. Besides, Motorola was an old-line device provider with a history of capitalising on its patents; it had also recently been involved in the patent war and disputed the patents of other smartphone manufacturers.³¹³ Therefore, the transfer of patents to Google would not substantially change the dynamics of wireless devices and relevant technologies, even if Google adopted the same strategy as Motorola's previous one.

6.4.3. Brief conclusion - Do the patents involved in the transaction help to enhance communication technology?

It is evident that both the EU Commission and the US DOJ intend to maintain a close watch on the circulation of SEPs in the wireless devices industry to prevent the use of

<http://www.justice.gov/opa/pr/2012/February/12-at-210.html>. Last accessed 15 December 2013.

³¹³ *Ibid.*

SEPs for hold-up purposes or threatening injunctive relief for unreasonable benefits. This not only applies to Google's competitors, but also the anticompetitive authorities. However, this is not necessarily the only influence on members of society. As far as Android subscribers are concerned, the patents obtained from Motorola empower the Android partners to defend or file countersuits when they are accused of patent infringement. This reduces Androids' costs, for example, of compromising on expensive licensing fees or creating substitute technology to replace others' patented technology. Therefore, Android can continue to provide free services to subscribers.

Google's acquisition of Motorola may make Android partners feel anxious. Since Motorola, a mobile hardware provider, has become part of Google, it is possible that Google's business will favour Motorola's hardware. The partners may also worry that Google will operate its hardware business using the resources from Motorola after the transaction,³¹⁴ thus becoming a hardware rival to its Android partners. If a patent dispute should occur between Google and a partner, the latter will experience the disadvantages of Google's patent portfolio. In fact, some Android partners have begun to consider partially turning to Microsoft's Windows Phone platform, which is not particularly locked to its own mobile devices.³¹⁵ On the one hand, Microsoft bought out Nokia and acquired the latter's mobile devices and services in 2013.³¹⁶ This deal allowed Microsoft to license Nokia's patents and consolidate its competitive

³¹⁴ VARMA, Ashish (2012). Google's Motorola acquisition: A case study. *Viewpoint*, Volume 3, No. 2. pp. 64-65.

³¹⁵ *Ibid.*

³¹⁶ REDMOND and ESPOO (2013). Microsoft to acquire Nokia's devices & services business, license Nokia's patent and mapping service. [Online] Available from: <http://www.microsoft.com/en-us/news/press/2013/sep13/09-02announcementpr.aspx>. Last accessed on 16 April 2014.

advantage in the mobile phone market.

Apple, Microsoft and Android partners' conduct will enable them to escape the series of patent litigation Google is facing, and on the other, they can avoid the possible disadvantages incurred by the merger. After this point was discussed here, Google announced that it would sell Motorola's handset business to Lenovo in January 2014,³¹⁷ and this may serve to reduce its Android partners' anxiety.

From an overall perspective, it cannot be denied that the way in which Google utilises the patents acquired from its merger with Motorola does have a certain level of influence on the strategies of mobile companies. However, it is questionable if smartphone companies will continue to purchase patents as weapons to maintain their competitiveness and create revenue rather than developing new technologies for their products. The way these companies acquire and practice their patents contravenes the aim of a patent, namely to promote innovation and reward the patent holder.

The investigation of this case by the EU Commission and the US DOJ gives a clue of the impact of the FRAND commitment made by a SEPs holding company on the stability of the availability of a technology and even the tendency of the industry to engage in creative research. This probably explains why patent holders are keen to have their patents selected as SEPs or to buy those that already are. In October 2013, the Rockstar consortium suited Google for patent infringement, claiming that its

³¹⁷ WINKLER, Rolfe and ANTE, Spencer E., 2014. Google sells handset business to Lenovo. *The Wall Street Journal*. Available from: <http://online.wsj.com/news/articles/SB10001424052702303743604579351163997405806>. Last accessed 6 February 2014.

seven patents regarding technology that enables internet search terms to match up advertising or information are based on the terms and other user data were infringed.³¹⁸ Since Rockstar acquired Nortel's patents and Google obtained Motorola's, there has been no substantial breakthrough improvement in mobile communication technology; instead, more patent litigations are filed worldwide based on these patents. This begs the question of whether the patents the two camps are fighting for are genuinely used to enhance smartphone technology, and regrettably, the answer at this stage is no. It appears that these acquisitions have resulted in more smartphone companies seeking to buy patents for anticompetitive purposes rather than the development of creative ideas.

³¹⁸ BBC News, 2013. Patent wars: Tech giants sue Samsung and Google. Available from: <http://www.bbc.co.uk/news/technology-24771421>. Last accessed 7 February 2013.

Chapter 7

Findings and discussion

7.1. Introduction

This chapter firstly verifies the primary issues to be solved to reinforce patent protection in smartphone industry. It continues to identify the anticompetitive means in patent law, which this study believes that it is the optimal deal with such issues, to determine whether or not patent law effectively responds to social interests. Moreover, some possible solutions to the problems will also be discussed in this chapter in an attempt to find an appropriate balance between patent exclusive right and the right to access patented works and boost the efficiency of patent system.

7.2. Findings – the exigent crisis in the smartphone industry and a possible solution

7.2.1. Patent quality

Different from the proprietary right awarded to a tangible asset with an explicit objective and a relatively precise way to measure its infringement and damage, a patent is the right granted to an intangible work; therefore, the scope of protection is less concrete and hard to determine the patent claim. This enables interested parties in the industry, including researchers, inventors, manufacturers, sellers and consumers, to easily infringe the patent, albeit unintentionally or even if they have taken reasonable care to avoid infringement.³¹⁹ However, a patent is considered to be valid as soon as it has been awarded, although the scope of its validity cannot be

³¹⁹ ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525, p. 529.

ascertained until enforcement is lodged in court; therefore, regardless of whether infringers are aware of the patent or not, as long as they utilise patented work without the necessary authority, their action will constitute infringement.

The examiners in the patent office are responsible for deciding whether a work can be patented or not. In terms of the process of patent application, there are underlying problems in the patent granting procedure that intensify the inefficiency of the patent system. Critics maintain that many patents have been awarded with an ambiguous scope, which has lowered the quality of patents,³²⁰ and this deficiency can be attributed to the myriad patent applications that overload the work of the patent office. The ever-increasing number of applications brought to the patent office and the complexity of the claims and descriptions not only severely burden the patent office, but also decelerate the examining process. Moreover, apart from the requirement of novelty, utility, and non-obvious features, examiners should also observe the existence of prior art; however, due to the number of cases, they sometimes overlook prior art during the examination and issue a patent to some that appear to be invalid.³²¹ They have limited time to undertake a patent examination, and the pressure of accumulated cases means that patents are sometimes issued with hindsight. Also, it is hard to map the wording in a patent claim to an actual technology in many cases, and as a result, the patents issued are too broad due to blurred claims and interpretation.³²²

³²⁰ HOVENKAMP, Herbert J. (2012). Competition in information technologies: Standard-essential patents, non-practicing entities and FRAND bidding. *U Iowa Legal Studies Research Paper No. 12-32*, p.1.

³²¹ ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525. p. 530.

³²² OLSON, David S. (2013). Removing the Troll from the Thicket: The Case for Enhancing Patent Maintenance Fees in Relation to the Size of a Patent Owner's Non-Practiced Patent Portfolio. *Boston College Law School Legal Studies Research Paper No. 303*, pp. 13-14.

Furthermore, inventions related to emerging technology normally apply existing works to make substantial improvements or assemble devices with new distinctive refinements, and there are limited resources to search for prior art in emerging technological industries like the smartphone industry.³²³ Inventors of component technologies often need to apply previous inventions to achieve economic value from a new component, and the numerous dubious patents granted by the patent office exposes them to the risk of unintentional patent infringement.

More patent applications are filed as individuals and companies begin to realise the importance of collecting patents to defend themselves, and this creates an even bigger backlog for the patent office and results in a vicious circle. What is worse is that it is suggested that a considerable number of issued patents have low economic value,³²⁴ but they are aggregated for defensive or even offensive purposes. As the socio-economic pattern evolved from industrial to information, the patent system was forced to undergo optimal changes to cater for the new era.

7.2.2. Patent aggregations and non-practicing entities

A great deal of attention has been paid to communication companies that have significant R&D strength and a considerable patent portfolio. In fact, as patent quality is deteriorating because of overly broad claims and dubious validity, individual inventors and smaller-scale entities have a better chance of obtaining a patent.³²⁵

³²³ OVERWALLE, Geertrui Van and SCHOVSBO, Jens (2007). Policy options for the improvement of the European patent system. *IIC*, 38(7). p. 837.

³²⁴ *Supra.*, note 299 at pp. 530-531.

³²⁵ LERNER, Josh (2010). The patent system in a time of turmoil. *W.I.P.O.J.*, 2(1). p. 35.

Since collecting a patent portfolio does not require an arduous effort, it increases the chance of speculators alleging a dubious patent against an elaborate product.³²⁶ For example, individual innovators who hold dubious patents may allege infringement to established firms who tend not to choose to risk the uncertainty of patent litigation. As a result, the firms have to compromise and settle the suit by paying to legally access the patent. What is worse is the trend that a considerable number of patents being asserted in the US court have changed hands, sometimes more than once.³²⁷ This means that the plaintiffs who lodge a patent action are neither the real inventors nor the original assignees.

Being conscious that claiming patents can be a lucrative business, many individuals and entities commit to patent aggregation. How such behaviour can stifle innovation and damage competition was illustrated earlier; the concern here is why the current patent system allows such a loophole to exist and makes it so difficult for inventors to engage in innovation.

Identifying whether a patent is applied by a certain technology or not and determining the value of the patent are costly tasks; especially when it comes to transitional patent disputes. Patent aggregation is sometimes taken as a strategy to prevent or even be able to defend an infringement assertion and minimise the damage it may cause.³²⁸ Practicing entities can reinforce their patent portfolio by means of patent aggregation; in other words, a robust portfolio gives them a

³²⁶ *Ibid.*

³²⁷ PENG, Yu-Shu and LIANG, I-Chung (2012). An exploratory study of patent litigation behaviour: Evidence from the smartphone industry. *2012 Proceedings of PICMET '12*, p.1022.

³²⁸ ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525. p. 546.

stronger defensive ability so that they have the incentive to ask for cross-licensing or forego an infringement assertion when they inevitably apply another's patented technology. Even if the practicing entity is prosecuted for infringement, its patent portfolio becomes a crucial means for striking back with a countersuit, and in this scenario, aggregation is conducive to the circulation of patents.

Unfortunately, countersuits do not pose a threat to non-practicing entities. Since they do not practice the patents they hold for innovative activities, it is highly unlikely that they will apply others' patents; therefore, other parties could hardly file a countersuit against them. Rather than making their patent available to the public, non-practicing entities sometimes conceal their patent information and ambush practicing companies as soon as the latter have invested a huge sum or adopted the claimed patent as an essential part of their product.

Collecting a bulk patent portfolio has become a trend for both practicing and non-practicing entities with the result that patent holders have become more interested in quantity than quality. The value of a patent is supposed to be determined by the innovative contribution that underlies it. The inability of practicing entities to know the substantial content of dubious patents gives patent portfolio holders a disproportionate influence above and beyond their actual worth. While it is true that the level of damage awards and the availability of injunctions in the EU are scarcer than in the US, enforcing a patent in Europe before a unitary patent system is established is costly. In terms of non-practicing entities, since they are solely bent on making a profit, if the targeted company attracts substantial revenue and is likely to be willing to compromise to preserve its investment, it is worth taking a risk to assert a patent against the company after an evaluation.

In late 2013, the European Commission approved Microsoft's acquisition of the majority of Nokia's mobile handset business after the acquisition had been approved in the US, although, when issuing the approval of this acquisition, the Vice-President of the Commission, Joaquin Almunia, expressed his concern about Nokia's next step. He warned Nokia not to attempt to extract a higher return on its leftover patents and behave like a patent troll.³²⁹ This case, again, illustrates the underlying danger of a company that does not (or not anymore) run a mobile phone business acting like a patent-asserting entity as it merely makes remuneration by licensing its patents. The Nokia case is even more high-profile due to the fact that its SEPs is on mobiles. Since it has no phone business, it is very likely that Nokia will license such patents in a litigious way rather than in fair conditions and obtain a profit from other companies.

7.2.3. Compulsory licensing

In principle, patent holders are entitled to make an autonomous decision concerning the practice of their patent; for example, using the patent for their own work or licensing it to other inventors and acquiring an agreed fee in return. Patent holders are not obliged to license their rights to others. However, as illustrated in previous chapters, a patent holder may refuse to supply a patent that is essential to an industry; and in this case, the government and the competent court will force the patent holder to authorise the use of the patent and accept a remuneration in return.

³²⁹ REGISINGER, Don (2013). EU to Nokia: Don't be a "patent troll". [Online] Available from: <http://www.cnet.com/uk/news/eu-to-nokia-dont-be-a-patent-troll/>. Last accessed on 10 April 2014.

The criteria of essential facilities doctrine set by the ECJ and CFI are the standards for considering if the refusal to supply IP information is abusive conduct, and if the abusive conduct intends to block substitution and harm competition, a compulsory license can be awarded. In this way, the doctrine helps by imposing a compulsory license as an obligation of right holders.³³⁰

However, it should be noted that the theory of block substitution to the downstream market cannot be the sole consideration in every case, since IP protection grants a variety of exclusive rights to different intellectual efforts, such as patents, copyright and trademarks, and the criterion applied in copyright cases may not necessarily be adequate in patent cases. The doctrine can merely be taken as a basic principle, and the intrinsic IP protection granted to each work should be based on the facts of specific individual cases. An evidence of this is the different implementation of the doctrine in the cases of *Magill* and *IMS Health* and *Microsoft*. A significant principle is that an IP right is a reward for right holders' investment in innovation; yet, this does not guarantee that right holders will recoup their investment in R&D. While it is certain that IP protection ensures right holders' legitimate exercise of their right, if that exercise exceeds the scope of the protection granted by IP, a compulsory license is an exceptional means of protection to enable recovery from the damage brought by the excessive exercise of rights.³³¹

It goes without saying that, in the ICT industry, products need to be interoperable to

³³⁰ CHOI, Jay Pil (2010). Compulsory licensing as an antitrust remedy. *W.I.P.O.J.*, 2(1). P. 79.

³³¹ ZHANG, Liguang (2010). Refusal to license intellectual property rights under Article 82 EC in the light of standardisation. *E.I.P.R.*, 32(8). pp. 410-411.

be accepted by consumers, and this barrier to entry increases the importance of licensing to access existing products. To refer back to patent issues, patent protection seeks to promote the overall interests of society by protecting the inventor's private right, namely the right to exclude, which would not exist without the invention. If this private right needs to be forfeited to promote the wellbeing of society, it should be accepted that the interests of society outweigh the private right inherent in the patent. In short, when patent holders refuse subsequent inventors a voluntary license and this refusal can be seen as being an abuse of their right, after carefully weighing the needs of both sides, competition means should intervene to compel patent holders to authorise access to the patent. However, this may dampen patent holders' aspiration to devote themselves to further innovation if they know they will be forced to allow competitors to use their patent. Therefore, compulsory licensing must be imposed with deliberate inspection and should be very discreetly invoked in order to prevent abuse but simultaneously maintain a pro-competitive IP policy.

The TRIPS Agreement provides a legal basis for a compulsory license, which restrains the legal right granted by patent law.³³² Its provision enables patented work to be used without the holder's permission, but third parties using such a patent need to be authorised by the government. What matters here is that it is also stressed that such use is permitted to be an anti-competitive remedy, as confirmed in a judicial or administrative process, and anti-competitive concern should be taken into account when determining the remuneration.³³³ Despite the fact that the TRIPS sanctions the legitimacy of compulsory licensing, there are diverse opinions as to whether or not it contravenes the goal of patent protection, which is to encourage innovation.

³³² Article 31 of the TRIPS Agreement.

³³³ *Ibid*, section (k).

In terms of critics of this regime, the disagreement with compulsory licensing mainly stems from the purpose of the patent system, which is to incentivise innovation. Compulsory licensing will significantly weaken patent holders' right, thereby reducing their opportunities to exclusively practice their patent and benefit from financial rewards; thus, inventors will be reluctant to invest time and money in new inventions because they are not likely to profit from the patent. This is especially true when the potential inventors are individuals or small start-ups without a sound financial background; financial rewards may be the decisive instrument to induce them to continue their innovative activities. In addition, since the imposition of a compulsory license constrains the practice of patents, it is limited in its enforcement and the ability to call for an injunction. This creates a risk that opportunistic users will infringe the patent when the holder lacks the ability to file for infringement litigation and acquire an injunction. The user can then ask for compulsory licensing to acquire authorisation and legalise his speculative behavior if the strategy fails.³³⁴ Potential licensees' gaming of the compulsory licensing system is another concern during its implementation. The regime gives licensees the opportunity to free-ride patent holders' intelligence fruit, and in order to enjoy the results without paying high costs, the former may deliberately conceal better licensing terms and wait for a compulsory license obligation to be imposed to the patent holders. In this case, the patent holder loses its chance to negotiate advantageous licensing terms.

On the other hand, many believe that a compulsory regime has more merits than disadvantages, and this seems to make more sense from an overall perspective,

³³⁴ NG, Elizabeth Siew Kuan (2009). Patent trolling: innovation at risk. *E.I.P.R.*, 31(12). p. 601.

especially in smartphone industries, in which product production depends on interdisciplinary information.

It cannot be denied that compulsory licensing can weaken patent holders' ability to benefit from their patent. However, it is acknowledged in the TRIPS Agreement that the need to deter anti-competitive behaviour should be considered when determining remuneration. This means that patent holders will obtain the appropriate royalties based on the level of anti-competitiveness; in addition, a regime that forces patent holders to grant a license to competitors can encourage them to voluntarily engage in cross-licensing so that they can utilise the patents in the same market and take reasonable advantage from each other. This will accelerate development in the industry rather than hindering it. In terms of the right to require an injunction, since the refusal to license needs to be deemed as being anti-competitive before a compulsory license can be imposed, it is very likely that granting an injunction to the patent holder will also raise the same concern. This can be proved by the non-practicing entities that act as patent trolls and ask for excessive fees.

Although compulsory licensing is a necessary exception to ensure competition, there are still no complete policies to regulate its imposition. The TRIPS Agreement merely provides a principle to allow it, but member nations need to establish a structure to impose it. The essential facilities doctrine is not an exhaustive list to verify the abuse of a dominant position. The doctrine should be applied flexibly to respond to the passage of time and the changing patterns of industry. Although the public interest should always take priority over private right, since compulsory licensing deprives patent holders of their legitimate right, it should only be invoked after seriously

evaluating the situation and ruling out all other possible solutions. It should be regarded as being the very last resort, which is why it is rarely applied in practice.

7.3. Conclusion

7.3.1. Does patent law enhance the information society?

It has been noted that strategic patents have been filed worldwide and that these make a very limited contribution to scientific and technological development.³³⁵ In addition, the problematic patent system is criticised for causing more obstacles to innovation rather than encouraging it.³³⁶ The theory of patent promotes innovation is merely an assumption to approve the aim of the patent system but the results remain unclear. If this theory is simply an ideal but is inaccurate, the information society will suffer unnecessary losses, such as the negative influence on competition derived from the patent system and the high price of products controlled by monopolistic right holders.³³⁷ For this reason, the theory is not convincing.

Therefore, in terms of the original purpose of a patent, it is argued that patents should not solely seek to encourage innovation; instead, the patent system should play the role of assisting the enhancement of the public interests via innovative activities. Basically, the improvement of innovation is too abstract to be defined; there is no way to measure the degree to which patents encourage innovation, and even if there was, it would be hard to prove that it was patents that stimulated the

³³⁵ SCHADE, Jurgen (2010). Is the Community (EU) patent behind the times? Globalisation urges multilateral cooperation. *IIC*, 41(7). p. 812.

³³⁶ LERNER, Josh (2010). The patent system in a time of turmoil. *W.I.P.O.J.*, 2(1). p. 36.

³³⁷ Shaver, Lea (2012). Illuminating innovation: from patent racing to patent war. *Wash. & Lee L. Rev.*, 69, p. 9.

enhancement of technology.

When making an overall inspection of the effectiveness and omissions of the patent system, it is unfair to conclude that patents completely fail to enhance the information society. Patent problems are much more complex in the smartphone industry than in other industries, since it contains a variety of sectors, such as network operators, device manufacturers and component manufacturers.³³⁸ Smartphones are currently in great demand, so it could be said that the patent system enhances the development of telecommunications in some aspects. The potentially massive profits make smartphone companies eager to be at the leading edge of this technology, which undoubtedly improves the quality of smartphones and its relevant services and benefits the dynamics of the technology economy.

In terms of whether the patent system enhances the information society, the answer is yes, it does, but it is not sufficiently effective because it is doubtful if this offsets the competitive risks involved. The potential competitive strategy that underlies the patent system appears to bring convenience and quality of life to the information society; yet, it contains the danger of patented works being monopolised, and this will limit the growth of technological research. Because of these problems, patents may harm the information society in the long term if feasible auxiliary measures are not implemented to address its deficiencies. This demand is especially urgent when anticompetitive measures remain vague and are applied inconsistently.

7.3.2. Recommendations and future work - How should patent law enhance the

³³⁸ ZHANG, Liguó (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4), p. 382.

information society and communication technology?

While some may say that policy-makers should balance the costs and benefits of patent exclusivity, unfortunately, this would involve the same problem of the absence of an objective standard to justify their value. This task appears to be unworkable due to the absence of effective justification of the patent system, as well as the difficulty of evaluating the costs and benefits it generates.³³⁹

A similar consideration can also be applied to the idea of making valuable patents approachable by limiting the duration of exclusivity, which means deciding the patent protection based on the efficacy of the patent in the market. The most dubious aspect of this idea is that there is hardly any criterion to evaluate a patent's efficacy in terms of improving technology, and another point to consider is unequal protection. Patent protection should be non-discriminatory to every patent holder so that patents can be accessible to every innovative person.

The idea of limiting the duration of exclusivity appears to be irrational if it is implemented alone; however, many commentators propose that compulsory licensing should be regarded as settling the abuse of a dominant position.³⁴⁰ It requires essential patent right holders to release their patents to other innovators during the twenty-year period of the patent and obtain licence fees or royalties in return, and this is especially meaningful if the patent is selected to be a SEP in the industry. Although this seems to be a relatively satisfying approach after reviewing ideas that are problematic at some level, relying on anti-competitive means

³³⁹ Shaver, Lea (2012). Illuminating innovation: from patent racing to patent war. *Wash. & Lee L. Rev.*, 69. p. 12.

³⁴⁰ CHOI, Jay P. (2010). Compulsory licensing as an antitrust remedy. *W.I.P.O.J.*, 2(1), pp. 74-75.

inevitably constrains patent holders from practicing their legitimate right. In addition, prudent observation when granting an injunctive relief to patent holders, as demonstrated in the *eBay* case, is also crucial to encourage voluntary patent licensing and reduce non-practicing entities' assertion of patent infringement; namely, the court should consider whether or not the claimed infringement causes actual damage to the patent holder, as well as the possible influence to the infringing entity and the welfare of society.

Albeit applying the assistance of competition law in order to achieve the goal of patents to stimulate innovation, adopting an *ex-ante* solution to deal with the inherent problems in the patent system is more fundamental than seeking anti-competitive means for an *ex-post* remedy. In this respect, monitoring the quality of the patent system is definitely a priority.

The patent system is supposed to reward patent holders for their investment in research and development, including their financial investment. The limited length of protection is criticised for being out of proportion with the effort and investment devoted, the lengthy preparation of a patent application, the long wait for the results, and patent disclosure to the public. Unfortunately, this problem seems to be intensified because of the territorial nature of patent protection and the continuous expansion of the cross-border trade environment,³⁴¹ which impose patent holders or potential patent applicants with the burden of considerable costs and time to have their work patented or their patents enforced in various countries.

³⁴¹ DESCHAMPS, Carole (2011). Patenting computer-related inventions in the US and in Europe: the need for domestic and international legal harmony. *E.I.P.R.*, 33(2). p. 105.

This goal is now applied in Europe and will sharply ease the cost and troublesome proceedings in patent application and enforcement. With regard to the international dimension, it may be hard to achieve a global unitary patent system. Since patent issues in smartphone industries are generally transnational and multinational, the industry could at least establish a neutral forum to provide suggestions on the necessity of patent enforcement and where and how to file a patent application. In this industry, patent holders can be giant companies in various countries; therefore it is essential that suggestions should be provided by mutual experts in patents and in smartphone-related technologies from random countries. Even if these suggestions have no legal force and their adoption completely depends on the claimant's autonomous decision, yet they may go some way to effectively increasing the efficiency of patent application and reducing the number of unnecessary patent lawsuits.

On the other hand, low-quality patents that are merely marginally important to technological improvement form a blockage to R&D that could, in fact, contribute to future innovation. Some commenters call for the reform of the patent system to reinforce its function of encouraging innovation;³⁴² for example, tailoring distinctive rules to regulate the patenting of particular innovations, such as genetic inventions, which may cause moral controversy and precision industries, in which the application of an invention generally requires a connection with prior patents or standardised technology.

Notwithstanding the need for the current patent system to be updated to

³⁴² SCHREPEL, Thibault (2013). Patent troll through the US and EU antitrust law: when co-operation is no longer an option. *E.C.L.R.*, 34(6). pp. 320-321.

accommodate emerging industries and maximise their accessibility without overly interfering with patent holders' privilege, it is inappropriate to lead patent law in divergent directions at this point. Since the patent system is currently suffering from a vicious circle of granting bad patents, the proposed divergence may simply exacerbate this chaos. This is not to say that tailoring specialised protection for each type of innovation is not a solution to patent ambush and hold-up problems in the technology industry; nonetheless, rectifying the inherent systematic problems of patent law is more realistic than considering a specialised patent at this stage.

Certain efforts have been made in Europe, where a report was presented by the Scientific Technology Options Assessment body of the European Parliament (hereafter the "STOA") in 2007 related to the way in which the work of the European patent system could be improved.³⁴³ This report was based on an independent, policy-orientated investigation and presented in the form of "Policy options for the improvement of the European patent system".

In this report, the STOA noted the problem that patent quality lowered the bar for obtaining a patent. It was suggested that the current European patent system should improve the quality of patents in respect of standards of patentability and the procedure to grant patents.³⁴⁴ Some of the proposals made to enhance patent quality included filtering applications and refusing those that required an unduly prolonged examination procedure, establishing appropriate mechanisms for searching for prior art, and raising the standard of examination by providing

³⁴³ European Parliament Scientific Technology Options Assessment (2007). Policy options for the improvement of the European patent system. (IP/A/STOA/FWC/2005-28/SC16). (Manuscript completed in 2007).

³⁴⁴ *Ibid.*, p. 36.

sufficient means and management to ensure a predictable and consistent decision.³⁴⁵ Above all, the fundamental concept, as indicated in the STOA report, should emphasise that patent office grant patents to serve the general interests of society, not those of the specific applicants. The purpose of granting inventors exclusive rights is to incentivise innovation, and the primary task to accomplish it is to maximise the accessibility to prior art with reasonable rewards to patentees. The first step toward this aim should be improving the patent examination system with a comprehensive prior art database, clear standards of examination, and a precise scope of patent rights to assist subsequent inventors to avoid unwitting infringement.

With respect to the US, according to a USPTO report, some progress has also been made in improving the patent issuance procedure. This includes alleviating the backlog in the USPTO by providing more effective training for examiners and enhancing their knowledge and skills regarding procedures and legal topics.³⁴⁶ In addition, the USPTO has also increased its collaboration with patent applicants, which enables applicants to better control the speed of the examination procedure because examiners can work more efficiently and deploy their resources to meet innovators' demands.

It is undeniable that the IP policy has a complicated net effect on related dimensions like the technology industry and the global economy.³⁴⁷ To prevent a patent from

³⁴⁵ *Ibid.* pp. 36-37

³⁴⁶ United States Patent and Trademark Office (2011), Performance and Accountability Report Fiscal Year 2011. Available from: <http://www.uspto.gov/about/stratplan/ar/USPTOFY2011PAR.pdf>. Last accessed on 15 February 2014.

³⁴⁷ PUGATCH, Meir Perez (2011). Intellectual property policy-making in the 21st century.

merely being a profit-seeking tool rather than an investment to advance useful arts, IP policy-making, especially patent policy, needs to consider a host of elements that can not only promote innovative investment in the short term, but also maximise the long-term interests of the majority of society. Competition law and patents have always had the same goal, since they both seek to ensure the diffusion of useful products and services for the public interest. Competition law plays a crucial role to boost the effective exploitation of patents in an age where compatibility and interconnection are necessary to market a product. It is essential to ease the inherent problems of patent law and thereby improve the quality of patent issuance and unify patent examination and enforcement. This is also important to deal with subsequent speculative behaviour when a patent has been granted by means of competition law.

Patent problems are extensive and profound. This study only explores those derived from the current status of smartphone patent wars. However, since technology is further developed every day, it is envisioned that more complex patent disputes will appear in the future. Some smartphone companies have begun to settle litigation and collaborate with each other; for example, Nokia and HTC settled all their pending litigation and agreed to cooperate on patent and technology in February 2014.³⁴⁸ It is good to see a more peaceful and constructive ending to smartphone patent disputes. Yet, it is important to monitor further patent collusion problems led by such collaboration. On the other hand, as a unitary patent system is adopted in the EU

W.I.P.O.J., 3(1), p. 71.

³⁴⁸ NOKIA (2014). Nokia and HTC signed a patent and technology collaboration agreement. [Online] Available from: <http://company.nokia.com/en/news/press-releases/2014/02/07/nokia-and-htc-signed-a-patent-and-technology-collaboration-agreement>. Last accessed on 15 April 2014.

with a Unified Patent Court, it is also worth observing how it can influence patent practice in the smartphone industry. With the continual advancement of smartphone functions and new patent policies, legislators, policy-makers and antitrust authorities are facing formidable challenges ahead.

(Total 29,972 words)

Bibliography

Primary sources:

International treaties

The Agreement on the Trade-Related Aspect of Intellectual Property Rights.

EU sources

European Patent Convention.

Implementing Regulation to the Convention on the Grant of European Patents.

Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the TFEU European Union to horizontal co-operation agreements.

Regulation 330/2010 on the application of article 101(3) of the Treaty on the Functioning of the European Union to categories of vertical agreements and concerted practices.

Regulation (EU) No. 1025/2012 of the European Parliament and of the Council of 23 October 2012 on European standardisation.

Regulation (EU) No. 1257/2012 of the European Parliament and of the Council of 17 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection [2012] OJ L361/1.

Treaty on the Functioning of the European Union.

Council Implementing Regulation (EU) No. 1260/2012 of 17 December 2012 implementing enhanced cooperation in the area of the creation of unitary patent protection with regard to the applicable translation arrangements, 2012 OJ L361.

Case 238/87, *AB Volvo v Erik Veng (UK)Ltd*[1988] E.C.R. 6211.

Case COMP/C-3/37.792, *Microsoft* [2004] OJ L32/23.

Case COMP/38.636, *Rambus*, December 2009.

Case Comp/M.6381, *Google/Motorola Mobility*, February 2012.

Case C-418/01, *IMS Health v NDC* [2004] E.C.R. I-5039.

Case COMP/M.6381, *Google/Motorola Mobility* (2012).

Case C-242/92, *Magill* [1995] E.C.R. 1-734.

Case T-201/04, *Microsoft v Commission* [2007] E.C.R. II-3601.

Case 322/81, *N. V. Netherlands Banden Industries Michelin v. Commission of the European Communities* [1983] ECR 3451.

Case C7/97, *Oscar Bronner GmbH & Co KG v Mediaprint Zeitungs und Zeitschriftenverlag GmbH & Co KG* [1998] E.C.R. I-7791; [1999] 4 C.M.L.R. 122.

Case 27/76, *United Brands Company v Commission* [1987] ECR 207.

US sources

Designs Act 1953 in the US.

FTC Act.

Sherman Act (Sections 1 to 7 of Title 15 of the US Code).

US Patent Act (Sections 1 to 376 of Title 35 of the US Code).

The US Constitution.

U.S. Department of Justice and the Federal Trade Commission (1995). Antitrust Guidelines for the Licensing of Intellectual Property.

Bonito Boats, Inc. v Thunder Craft Boats, Inc., 489 U.S. 141, 146 (1989).

Broadcom Corp. v. Qualcomm Inc., 501 F.3d 297 (3d Cir 2007).

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

eBay Inc. et. al. v MercExchange, L.L.C. 547 U.S. 388 (2006).

Case No. 3:05-cv-03350. D.C. Civil for the District of New Jersey.

Case No. 2:11 – cv- 00090- JRG. Decision made in the United States District Court for the Eastern District of Texas Marshall Division.

Case No. 11-CV-01864-LHK, United State District Courts, Northern District of California, San Jose Division.

MCI communications v AT&T, 708 F.2d 1081 (7th Cir.1983). 464 US 891 (1983).

Rambus, Inc. v. FTC, 522 F.3d 456 (D.C. Cir. 2008).

United States v. Grinnell Corp 384 U.S. 563 (1996).

The United States Department of Justice (2012). Statement of the Department of Justice's Antitrust Division on its decision to close its investigations of Google Inc.'s acquisition of Motorola Mobility Holdings Inc. and the acquisitions of certain patents by Apple Inc., Microsoft Corp. and Research in Motion Ltd..

The United States Department of Justice (2014). Statement of the Department of Justice Antitrust Division on its decision to close its investigation of Samsung's use of its standards-essential patents.

US FTC (2006). Docket No. 9302.

US Patent No. 7525922.

US Patent No. 7222078.

US Patent No. 7822816.

UK sources

Registered Design Act 1949.

HTC Europe Co Ltd v Apple Inc [2012] EWHC 1789 (Pat); [2013] EWCA Civ 451.

Nokia Corp v Interdigital Corp [2007] EWHC 3077 (Pat).

Samsung Electronics Co Ltd v Apple Retail UK Ltd & Anor [2013] EWHC 468 (Pat).

German sources

German federal Supreme Court, *Standard Tight-Head Drum (Standard-Spundfass)*, 36 IIC No.6 (2005).

Landgericht Munchen (*Apple v Motorola*) Unreported February 16, 2012 (Germany).

Italian sources

Samsung Electronics Co Ltd v Apple Inc. Unreported January 5, 2012 (Trib (Milano)).

The Netherlands Sources

D.C. Hague, Mar. 14, 2012, Dkt. Nos. 400367/HA ZA 11-2212, 400376/ HA ZA 11-2213, 400385 / HA ZA 11-2215 (Samsung Elecs. Co. Ltd/Apple Inc.)

Secondary sources:

ANN, Christoph (2011). Patents, piracy and competition. *ICC*, 42(8).

Anonymous (2011). United States: intellectual property – patents. *C.T.L.R.*, 17(6).

ARTHER, Charles (2011). More app developers sued over patent claims. Available via The Guardian from: <http://www.theguardian.com/technology/2011/may/18/app-developers-sued-over-patent-claims>. Last accessed on 7 November 2013.

BARBER, William G. (2013). Global patent harmonization: an idea whose time has come. *ICC*, 44(1).

BBC News, 2013. Patent wars: Tech giants sue Samsung and Google. Available from: <http://www.bbc.co.uk/news/technology-24771421>. Last access on 7th February 2013.

BISHOP, Bryan (2012) Samsung: today's verdict 'a loss for the American consumer'. [Online] Available from: <http://www.theverge.com/2012/8/24/3266653/samsung-todays-apple-trial-statement-loss-american-consumer>. Last access on 1 May 2013.

BONADIO, Enrico (2013). Standardization agreements, intellectual property rights and anti-competitive concerns. *Q.M.J.I.P.*, 3(1).

BUI, Jessica H. (2013). Apple vs. Samsung: smartphone patent war, practical implication and repercussions of Samsung verdict within the smartphone industry. [Online] Available from: <http://www.buigarcia.com/docs/Apple%20v%20Samsung.pdf>. Last accessed on 7 March 2014.

CASTELLS, Manuel, et al (2007). *Mobile communication and society. A global perspective*. MIT Press, Cambridge.

CASTLE, Matthew (2012). Mobile patent wars: Is the patent system broken? [Online]: Available from: <http://cblr.columbia.edu/archives/12337>. Last accessed on 6 April 2014.

CARRIER, Michael A (2012). A roadmap to the smartphone patent wars and FRAND licensing. *CPI Antitrust Chronicle*, April (2).

CHIEN, Colleen V. and LEMLEY, Mark A. (2012). Patent holdup, the ICT, and the public interest. *Cornell Law Review*, Stanford Public Law Working Paper No. 2022168.

CHOI, Jay Pil (2010). Compulsory licensing as an antitrust remedy. *W.I.P.O.J.*, 2(1).

CHRONOPOULOS, Apostolos (2009). Patent Standards – a case for US antitrust law or a call for recognizing immanent public policy limitations to the exploitation rights conferred by the Patent Act? *ICC*, 40(7).

COX, M.B., (2012). Apple's exclusive distribution agreements: a refusal to supply? *E.C.L.R.*, 33(1).

CULLIS, Roger (2007). *Patents, inventions and the dynamics of innovation. A multidisciplinary study*. Edward Elgar Publishing, Inc., Cheltenham.

DALRYMPLE, Jim (2011). Apple, 31 other companies sued for patent infringement. Available via The Loop at <http://www.loopinsight.com/2011/03/31/apple-31-other-companies-sued-for-patent-infringement/>. Last accessed on 7 November 2013.

DAPONTE, P. et al. (2013). States of the art and future development of measurement applications on smartphones. *Measurement*, 46.

DESCHAMPS, Carole (2011). Patenting computer-related inventions in the US and in Europe: the need for domestic and international legal harmony. *E.I.P.R.*, 33(2).

DEVLIN, Alan (2009). The stochastic relationship between patents and antitrust. *J.C.L. & E.*, 5(1).

EPC (2012). European Patent Office welcomes historic agreement on unitary patent. [Online] Available from: <http://www.epo.org/news-issues/news/2012/20121211.html>. Last accessed 29 September 2013.

EPC. What is the unitary patent? [Online] Available from: <http://www.epo.org/law-practice/unitary/faq.html#faq-630>. Last accessed 19 October 2013.

EPC. Agreement establishing a Unified Patent Court 2013. [Online] Available from: <http://www.epo.org/law-practice/unitary/faq.html#faq-630>. Last accessed 19 October 2013.

EPC. When will the “patent package” enter into force? [Online] Available from: <http://www.epo.org/service-support/faq/procedure-law/faq.html#faq-635>. Last accessed on 13 April 2014.

EPC. What are the main features of the Unified Patent Court?[Online] Available from: <http://www.epo.org/law-practice/unitary/faq.html#faq-636>. Last accessed 19 October 2013.

ETSI Guide on Intellectual Property Rights (IPRs), 2011. [Online]Available from: <http://www.etsi.org/images/files/IPR/etsi-guide-on-ipr.pdf>. Last accessed on 25 Sep 2013.

European Commission (2007), Antitrust: Commission confirms sending a Statement of objection to Rambus. MEMO/07/330. Available from: [http://europa.eu/rapid/press-release MEMO-07-330 en.htm](http://europa.eu/rapid/press-release_MEMO-07-330_en.htm). Last accessed on 07 Dec 2013.

European Commission (2007), Antitrust: Communication initiates formal proceedings against Qualcomm. MEMO/07/389. Available from: <http://europa.eu/rapid/press-release MEMO-07-389 en.htm>. Last accessed on 30 March 2014.

European Commission (2009), Antitrust: Commission closes formal proceedings against Qualcomm. MEMO/09/516. Available from: <http://europa.eu/rapid/press-release MEMO-09-516 en.htm>. Last accessed on 30 March 2014.

European Commission (2012). Joaquín Almunia Vice President of the European Commission responsible for Competition Policy Industrial policy and Competition policy: Quo vadis Europa? New Frontiers of Antitrust 2012 – Revue Concurrences Paris, 10 February 2012. Available from: <http://europa.eu/rapid/press-release SPEECH-12-83 en.htm?locale=en>. Last accessed 5 Jan 2013.

European Commission, 2012. Antitrust: Commission opens proceedings against Samsung. Available from: <http://europa.eu/rapid/press-release IP-12-89 en.htm?locale=en>. Last accessed on 30 March 2014.

European Commission, 2012. Merger: Commission approves acquisition of Motorola Mobility by Google. IP/12/129. Available from: http://europa.eu/rapid/press-release_IP-12-129_en.htm. Last accessed on 10 Feb

2014.

European Commission. What is the “unitary patent package?”[Online] Available from: http://ec.europa.eu/internal_market/indprop/patent/faqs/index_en.htm#maincontentSec1. Last accessed 20 October 2013.

European Commission (2014). Antitrust: Commission finds that Motorola Mobility infringed EU competition rules by missing standard essential patents. [online] Available from: http://europa.eu/rapid/press-release_IP-14-489_en.htm. Last accessed on 20 June 2014.

European Parliament Scientific Technology Options Assessment (2007). Policy options for the improvement of the European patent system. (IP/A/STOA/FWC/2005-28/SC16). (Manuscript completed in 2007).

Foss Patents (2012). List of 50 plus Apple-Samsung lawsuits in 10 countries. [Online] Available from: <http://www.fosspatents.com/search?updated-min=2014-01-01T00:00:00%2B01:00&updated-max=2015-01-01T00:00:00%2B01:00&max-results=50>. Last accessed on 3 April 2014.

Foss Patent (2013). Apple’s slide-to-unlock patent invalidated in German (decision is appealable). [Online] Available from: <http://www.fosspatents.com/2013/04/apples-slide-to-unlock-patent.html>. Last accessed on 10 April 2014.

FUSCO, Stefania (2012). Markets and patents enforcement: A comparative investigation of non-practicing entities in the US and Europe. *Michigan Telecommunications and Technology Law review*.

GERADIN, Damien (2013). The years of DG competition effort to provide Guidance on the application of competition rules to the licensing of standard-essential patent: Where do we stand? [online] Available from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2204359. Last accessed on 15 November 2013.

GILBERT, David (2014). Almunia: EU antitrust investigation into Samsung patent abuse to end this April. *International Business Times*. [Online] Available from: <http://www.ibtimes.co.uk/almunia-eu-antitrust-investigation-into-samsung-patent-abuse-end-this-april-1435552>. Last accessed on 21 April 2014.

GIFFORD, Daniel J. and KUDRLE, Robert T. (2011). Antitrust approaches to

dynamically competitive industries in the United States and the European Union. *J.C.L. & E.*, 7(3).

Google. Google + Motorola: What people are saying. Available at: <https://www.google.com/press/motorola/quotes/>. Last accessed on 6 February 2014.

GOPAKUMAR, Anoop (2011). Angry bird attacked – Mobile app developers targeted in patent litigation. [Online] Available from: <http://wiki.piug.org/display/PIUG/2011/09/06/Angry+Bird+Attacked+-+Mobile+App+Developers+Targeted+In+Patent+Litigation>. Last accessed on 21 April 2014.

GOTTS, Ilene K. *et al.* (2012). Antitrust concerns of patent acquisition. *CPI Antitrust Chronicle*, September (2).

GARTNER (2013). Gartner Says Worldwide Mobile Phone Sales Declined 1.7 Percent in 2012. [Online] Available from: <http://www.gartner.com/newsroom/id/2335616>. Last accessed on 3rd April 2013.

GARTNER (2014). Garner says annual smartphone sales surpassed sales of feature phones for the first time in 2013. [Online] Available from: <http://www.gartner.com/newsroom/id/2665715>. Last accessed on 20 April 2014.

GRAEF, Inge (2011). Tailoring the essential facilities doctrine to the IT sector: compulsory licensing of the intellectual property rights after Microsoft. *C.S.L.R.*, 7(1).

GRAHAM, Stuart and VISHNUBHAKAT, Saurabh (2013). Of smart phone wars and software patents. *Journal of Economic Perspectives*, 27(1).

GREENFIELD, Leon B. *et al.* (2013). SEP enforcement Disputes beyond the water's edge: A survey of recent non-U.S. decisions. *Antitrust*, vol. 27, No. 3.

HABENICHT, Jeffery (2012). Apple Inc. v. Samsung Electronics Co., LTD.. Available from <http://jolt.law.harvard.edu/digest/patent/apple-inc-v-samsung-electronics-co-ltd>. Last access 3 May 2013.

HALL, Matthew (2014). New EU competition regime for technology licensing agreements. [Online] Available from: <http://www.lexology.com/library/detail.aspx?g=1775a826-c236-478c-b119-b328fcc23a5a>. Last accessed on 20 April 2014.

HAUNSS, Sebastian (2013). *Conflicts in the Knowledge Society: The contentious politics of intellectual property*. 1st ed., Cambridge, Cambridge University Press.

HOEHN Thomas and LEWIS Alex (2013). Interoperability remedies, FRAND licensing and innovation: a review of recent case law. *E.C.L.R.*, 34(2).

HOVENKAMP, Herbert J. (2012). Competition in information technologies: Standard-essential patents, non-practicing entities and FRAND bidding. *U Iowa Legal Studies Research Paper No. 12-32*.

HOYLE, Ben (2013). Apple v Samsung: the art of war. *E.I.P.R.*, 35(9).

HOYLE, Ben (2013). Apple v Samsung: lessons from a global intellectual property war. *C.T.L.R.*, 19(2).

HOYLE, Ben (2013). Apple v Samsung: the song remains the same?. *C.T.L.R.*, 19(4).

ILTAN, Cigdem (2011). Waging a patent war. *Maclean's*, Vol. 124, Issue 31.

KAZI, Ilya (2011). Will we ever see a single patent system covering the EU, let alone spanning the Atlantic or Pacific? *E.I.P.R.*, 33(8).

KIRK, Ewan (1999). Encryption and competition in the information society. *I.P.Q.*, 1.

KOELMAN, Kamiel J. (2006). An exception standardis: do we need an IP exemption for standards? *ICC*, 37(7).

KOENIG, Christian and TRIAS, Ana (2010). Some standards for standardization: a basis for harmonization and efficiency maximization of EU and US antitrust control of the standard-setting process. *E.I.P.R.*, 32(7).

LANE, Matthew Cameron (2013). Patent wars: How the government can best address anticompetitive patent accumulation by updating the Horizontal Merger Guidelines. Available via SSRN from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2225990. Last accessed on 9th February 2014.

LANG, John Temple (2011). Patent pool and agreements on standard. *E.L.Rev.*, 36(6).

LAYNE-FARRAR, Anne (2011). Assessing IPR disclosure within standard setting: An ICT case study. Accessed via SSRN on 15 June 2013.

LEMLEY, Mark A. and MELAMED, Douglas (2013). Missing the forest for the trolls. *Columbia Law Review*, Vol. 113.

LERNER, Josh (2010). The patent system in a time of turmoil. *W.I.P.O.J.*, 2(1).

LEVINE, Dan (2012). United States: Intellectual Property – patents. *C.T.L.R.*, 18(8). pp. N212-N213.

LEWIS, Jeffrey I.D. (2013). The sky is not falling: Navigating the smartphone patent thicket. [Online] Available from: http://www.wipo.int/wipo_magazine/en/2013/01/article_0002.html. Last accessed on 10 October 2013.

LIIVAK, Oscar (2013). Establishing an Island of patent sanity. *Cornell Law School research paper* No. 13-06.

LIKHOVSKI, Michal (2001). Fighting the patent wars. *E.I.P.R.*, 23(6).

LIM, Daryl (2010). Post eBay – a brave new world. *E.I.P.R.*, 32(10).

LIN, Rich and DONNER, Jonathan, 2009. *Mobile communication*. 1st ed., polity press, Cambridge.

LOVE, Brian J. (2012). Past unlawful injunctions shouldn't cloud Samsung Galaxy S III's future. *TechCrunch*. Accessed via SSRN on 1 May 2013.

MAIER, Timothy J. (2011). Diving into the patent pool. *Intellectual Property Magazine*. Available from: <http://www.maierandmaier.com/documents/Timothy-J-Maier-IPM-October-2011-Diving-Into-the-Patent-Pool.pdf>. Last accessed on 27th February 2014.

MAIR, Carl (2012). Openness, intellectual property and standardization in the European ICT sector. Digital Repository @Maurer Law, Volume 2, Issue 2. Accessed via SSRN on 15 June 2013.

MAIR, Carl (2013). The uneasy interface between patent law and competition policy. [Online] Available from: <http://leidenlawblog.nl/articles/the-uneasy-interface-between-patent-law-and-competition-policy>. Last accessed on 7 April 2014.

MANNE, Geoffrey A. and WRIGHT, Joshua D. (2009). Regulating innovation: Competition policy and patent law under uncertainty. *Lewis & Clark Law School Legal Research Paper Series*, Paper No. 2009-19.

MARINIELLO, Mario (2011). Fair, reasonable and non-discriminatory (FRAND) terms: a challenge for competition authorities. *J.C.L. & E.*, 7(3).

MULLER, Florian (2011). Ne smartphone suit also targets app developers: H-W Technology sues 32 parties. [Online] Available from: <http://www.foospatents.com/2011/03/new-smartphone-patent-suit-also-targets.html>. Last accessed on 10 November 2013.

MASNICK, Mike (2014). Newegg gets patent troll Marcosolve to "fold like a cheap

suit". [Online] Available from: <https://www.techdirt.com/articles/20140402/14293426778/newegg-gets-patent-troll-macrosolve-to-fold-like-cheap-suit.shtml>. Last accessed 24 April 2014.

MULLIN, Joe (2014). Newegg and friends crush a patent troll. [Online] Available from: <http://arstechnica.com/tech-policy/2014/04/newegg-and-geico-stop-patent-troll-that-sued-dozens-over-forms-on-apps/>. Last accessed on 24 April 2014.

NOKIA (2014). Nokia and HTC signed a patent and technology collaboration agreement. [Online] Available from: <http://company.nokia.com/en/news/press-releases/2014/02/07/nokia-and-htc-signed-a-patent-and-technology-collaboration-agreement>. Last accessed on 15 April 2014.

NG, Elizabeth Siew Kuan (2009). Patent trolling: innovation at risk. *E.I.P.R.*, 31(12).

O'CONNOR, Thomas S. (2011). Development of intellectual property laws for the Russian Federation. *Journal of Business Research*, 64.

OHKUMA, Yasuo et al (2007). Patent trolls in the US, Japan, Taiwan and Europe (Digest). *Tokugikon*, I. 30. No.244. Available from:

<http://www.tokugikon.jp/gikonshi/244kiko1e.pdf>. Last accessed on 11th October 2013.

OLSON, David S. (2013). Removing the Troll from the Thicket: The Case for Enhancing Patent Maintenance Fees in Relation to the Size of a Patent Owner's Non-Practiced Patent Portfolio. *Boston College Law School Legal Studies Research Paper No. 303*.

ORR, Justin R. (2013). Patent aggregation: Models, harms, and the limited role of antitrust. *Berkeley Technology Law Journal*, Vol. 28:525.

OVERWALLE, Geertrui Van and SCHOVSBO, Jens (2007). Policy options for the improvement of the European patent system. *IIC*, 38(7).

PARKHURST, Emily (2012). Microsoft, Apple take on Google. [Online] Available from: <http://www.bizjournals.com/seattle/blog/techflash/2012/02/microsoft-apple-take-on-google.html?page=all>. Last accessed on 15 June 2014.

PATRICK (2011). Eastern District of Texas – Leaving the playing field. [Online] Available from: <http://gametimeip.com/2011/01/07/eastern-district-of-texas-leveling-the-playing-field/>. Last Accessed on 16 June 2014.

PEERS, Steve (2011). The constitutional implication of the EU patent. *E.C.L. Review*, 7(2).

PENG, Yu-Shu and LIANG, I-Chung (2012). An exploratory study of patent litigation

behaviour: Evidence from smartphone industry. *2012 Proceedings of PICMET '12*.

PEREIRA, Alexandre L.D. (2011). Software interoperability, intellectual property and competition law – Compulsory licenses for abuse of market dominance. *Computer Law & Security Review*, 27.

PEHLIVAN, Ceyhun Necati (2012). The creation of a single European patent system: from dream to (almost) reality. *E.I.P.R.*, 34(7).

PISTOLESI, Roberto (2013). The role of the CJEU in relation to patent disputes, in particular under UPC. [Online] Available from: http://www.dragotti.com/images%5Ccp_articoli%5CThe%20role%20of%20the%20CJEU%20in%20relation%20to%20patent%20disputes.pdf. Last Accessed on 26 October 2013.

POSNER, Richard (2012). Do patent and copyright law restrict competition and creativity excessively? [Online] Available from: <http://www.becker-posner-blog.com/2012/09/do-patent-and-copyright-law-restrict-competition-and-creativity-excessively-posner.html>.

PUGATCH, Meir Perez (2011). Intellectual property policy-making in the 21st century. *W.I.P.O.J.*, 3(1).

REGISINGER, Don (2013). EU to Nokia: Don't be a "patent troll". [Online] Available from: <http://www.cnet.com/uk/news/eu-to-nokia-dont-be-a-patent-troll/>.

ROMANDINI, Roberto and KLICZNIK, Alexander (2013). The territoriality principle and transnational use of patented inventions – the wider reach of a unitary patented and the role of the CJEU. *IIC*, 44(5).

REDMOND and ESPOO (2013). Microsoft to acquire Nokia's devices & services business, license Nokia's patent and mapping service. [Online] Available from: <http://www.microsoft.com/en-us/news/press/2013/sep13/09-02announcemementpr.aspx>. Last accessed on 16 April 2014.

ROTONDO, Elisabetta (2012). European Commission initiates proceedings against Samsung for abuse of dominance by failing to license its standard-essential patents on fair, reasonable and non-discriminatory terms. *E.C.L.R.*, 33(8).

SATTLER, Sven (2011). Standardisation under EU competition rules – the Commission's new horizontal guidelines. *E.C.L.R.*, 32(7).

SCHADE, Jurgen (2010). Is the Community (EU) patent behind the times? Globalisation urges multilateral cooperation. *IIC*, 41(7).

SCHMIDT, Hedvig K.S. (2010). The influence of IP rights on product definition in competition law – the curious case of tying. *I.C.C.L.R.*, 21(6).

SCHOVSBO, Jens (2011). Constructing an efficient and balanced European patent system: “Muddling through”. [Online] Available from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1932690. Last accessed on 31 January 2014.

SCHRAG, Joel (2006). The value of a second bite at the Apple: The effect of patent dispute settlements on entry and consumer welfare. *FTC Bureau of Economics working papers*, No.281.

SCHREPEL, Thibault (2013). Patent troll through the US and EU antitrust law: when co-operation is no longer an option. *E.C.L.R.*, 34(6).

SEGAN, Sascha (2012). Infographic: Smartphone patent wars explained. [Online]: Available from: <http://www.pcmag.com/article2/0,2817,2399098,00.asp>. Last accessed on 3 April 2014.

Shaver, Lea (2012). Illuminating innovation: from patent racing to patent war. *Wash. & Lee L. Rev.*, 69.

SHURKIN, Joel (2011). Fighting patent ‘trolls’ – there’s no app for that. *New Scientist*, 210, 2817.

SIRAGUSA, Mario (2012). Italy: Tribunal of Milan – Samsung v Apple, January 5, 2012. *G.C.L.R.*, 5(3), page R 32-R33.

SHAPIRO, Carl (2001). Navigating the patent thicket: Cross licenses, patent pools, and standard-setting. *Innovation Policy and Economy*, Volume 1.

SUBRAMANIAN, Sujitha (2008). Patent trolls in thickets: who is fishing under the bridge? *E.I.P.R.*, 30(5).

THAMBISETTY, Sivaramjani (2013). Why patent law doesn’t do innovation policy? *LSE Law, Society and Economy Working Papers*, 20.

Telecommunications Industry Association. [Online] Available from: <http://www.tiaonline.org/standards/>. Last accessed on 25 Sep 2013.

TIAN, George Yijun (2011). Competition law and IP abuse prevention in Australia: a comparative study. *W.I.P.O.J.*, 2(2).

TORTI, Valerio (2012). IPRs, competition and standard setting: in search of a model address hold-up. *E.C.L.R.*, 33(9).

TOTH, Andras (2008). Protection of investments in European abuse of dominance cases. *E.C.L.R.*, 29(12).

TOTHILL, John (2012). The mobile phone patent wars. *C.T.L.R.*, 18(4).

United States International Trade Commission. Mission Statement. [Online] Available from: http://www.usitc.gov/press_room/mission_statement.htm. Last accessed on 13 November 2013.

United States Patent and Trademark Office (2011), Performance and Accountability Report Fiscal Year 2011. Available at: <http://www.uspto.gov/about/stratplan/ar/USPTOFY2011PAR.pdf>. Last accessed on 15 February 2014.

VARDNER, Joseph (2011). The statutory presumption of patent validity in antitrust cases. *Harvard Journal of Law & Technology*, vol. 23, number 1 Fall 2011.

VARMA, Ashish (2012). Google's Motorola acquisition: A case study. *Viewpoint*, Volume 3, No.2.

WADLOW, Christopher (2012). The emergent European law of unfair competition and its consumer law origins. *U.P.Q.*, 1.

WIPO. Economic development and patent. [Online] Available at: <http://www.wipo.int/patent-law/en/developments/economic.html>. Last access on 4 December 2012.

WEBSTER, Frank (2004). *The information society reader*. 1st ed., London, Routledge.

YEH, Brian T. (2013). An overview of the "patent trolls" debate. *CRS Report of Congress*.

WEST, Alexandra et al. (2013). Unitary patents and the Unified Patent Court. *C.T.L.R.*, 19(4).

WILLIAMS, Fred I. and SAFIULLAH Rehan M. (2012). The smartphone patent wars: A US perspective. *The Licensing Journal*. June/July.

WINKLER, Rolfe and ANTE, Spencer E., 2014. Google sells handset business to Lenovo. *The Wall Street Journal*. Available at: <http://online.wsj.com/news/articles/SB10001424052702303743604579351163997405806>. Last accessed on 6 February 2014.

XENOS, Dimitris (2013). The European unified patent court: assessment and implication of the federalization of the patent system in Europe. *Scripted*, Volume 10, Issue 2. P. 247.

YU, Qiang (2014). Software interoperability information disclosure and competition law. *E.C.L.R.*, 35(3).

ZHANG, Liguó (2010). Refusal to license intellectual property rights under article 82 EC in light of standardization context. *E.I.P.R.*, 32(8).

ZHANG, Liguó (2010). How IPR policies of telecommunication standard-setting organisations can effectively address the patent ambush problem. *IIC*, 41(4).