



Practice Project Title: Beyond patent pools: a comprehensive proposal to decrease litigation over standard-essential patents (legal opinion)

## **MEMORANDUM**

TO: European Patent Office

FROM: A N Other

DATE: 1<sup>st</sup> September 2021

RE: Beyond patent pools: a comprehensive proposal to decrease litigation over standard-essential patents (legal opinion)

# **LEGAL OPINION**

## **BEYOND PATENT POOLS: A COMPREHENSIVE PROPOSAL TO DECREASE LITIGATION OVER STANDARD-ESSENTIAL PATENTS**

### **Summary of findings and proposals**

The IoT wars may be the sequel of the smartphone wars if the process of standardizing and licensing standard-essential patents remains unchanged. The market failures arising from the deficient Intellectual Property Rights policies of standard setting organizations, namely, patent hold up, hold out, ambush, over-declaration, and royalty stacking, are causing this trend of increasing litigation. However, patent pools alone cannot end this challenge; a three-pronged strategy is necessary. First, the Intellectual Property Rights policies of standard-setting organizations have to be reformed. Second, the mechanism of patent pools has to be institutionalized within standard-setting organizations. Finally, patent offices must be equipped with compulsory licensing powers for the specific aim of ensuring interoperability. This way, litigation over standard-essential patents will be reduced since most of the existing controversies will be solved at the standard-setting organization or the patent office level, and only the most complex claims will get to court.

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# LEGAL OPINION

## BEYOND PATENT POOLS: A COMPREHENSIVE PROPOSAL TO DECREASE LITIGATION OVER STANDARD-ESSENTIAL PATENTS

### I. Introduction

I have been asked by the European Patent Office to write this legal opinion on a proposal to decrease litigation over standard-essential patents. This institution has faced the backlash of the Smartphone patent wars, where the leading mobile phone developers and manufacturers have used their patents as grounds to file lawsuits against each other to get rid of competitors. Through this piece of advice, the office intends to avoid that the same trend is repeated in relation to the Internet of Things. However, to understand why a different industry is threatened with the same problem, it is necessary to consider what they have in common: interoperability standards.

The contemporary technological landscape is ruled by one principle: interoperability. Any new technological device placed on the market must be capable of interacting with the appliances with which it coexists<sup>1</sup>. The necessity of making our machines compatible is no longer limited to computers and cellphones. We are immersed in the SMART revolution; every gadget is embedded with sensors that enable interaction with their surrounding physical environment and other devices<sup>2</sup>. Within this tendency, the notion of the Internet of Things, connecting our appliances to the internet<sup>3</sup> (*See Annex II*), should not be underrated. Nowadays, there are more objects than people connected to the internet<sup>4</sup>. The number of networked devices is expected to grow to 30,9 billion<sup>5</sup> (*See*

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<sup>1</sup> Cody M Akins, ‘Overdeclaration of Standard-Essential Patents’ (2020) 98 Texas Law Review 579, 579.

<sup>2</sup> Luke McDonagh and Enrico Bonadio, *Standard Essential Patents and the Internet of Things: In-Depth Analysis* (European Union, 2019) 6; Robin Kester, ‘Demystifying the Internet of Things: Industry Impact, Standardization Problems, and Legal Considerations’ (2016) 8 Elon Law Review 205, 206.

<sup>3</sup> Pierre Régibeau, Raphaël de Coninck and Hans Zenger, *Transparency, Predictability, and Efficiency of SSO-based Standardization and SEP Licensing: A Report for the European Commission* (European Union 2016) 25.

<sup>4</sup> Kester (n 2) 206.

<sup>5</sup> IoT Analytics, ‘Internet of Things (IoT) and non-IoT active device connections worldwide from 2010 to 2025 (in billions)’ (Statista 2021) 1.

*Annex III*) and a value of 677,6 billion dollars by 2025<sup>6</sup> (*See Annex IV*). However, how has it been possible to interconnect all these machines that different actors develop? Through standards.

Lemley defines standards as "any set of technical specifications that either provides or is intended to provide a common design for a product or process"<sup>7</sup>. In general terms, there are two types of standards<sup>8</sup>. On the one hand, quality and safety standards establish a set of requirements to ensure that a particular product or process is not harmful to human health or the environment<sup>9</sup>. On the other hand, interoperability standards enable interaction among devices<sup>10</sup> and, thus, the author will aim at them for this legal opinion.

Interoperability standards may arise in three manners. Firstly, *de facto* standards arise out of their implementation by leading companies and their widespread use by consumers<sup>11</sup>, such as the success of the VHS over the Betamax format<sup>12</sup>. Secondly, legal standards may be imposed by governmental bodies<sup>13</sup>. Finally, collaborative standards are developed by Standard Setting Organizations (SSOs), institutions in which all types of stakeholders to a technology (manufacturers, implementers, universities, individuals, governments, Etc.) voluntarily participate to agree on standards<sup>14</sup>. Most standards, including IoT standards, are nowadays created through SSOs<sup>15</sup>; consequently, I focus on the latter.

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<sup>6</sup> Transforma Insights, 'Internet of Things (IoT) revenue worldwide from 2019 to 2030 (in billion U.S. dollars), by vertical' (Statista 2021) 1.

<sup>7</sup> Mark A Lemley, 'Intellectual Property Rights and Standard-Setting Organizations' (2002) 90(6) California Law Review 1889, 1896.

<sup>8</sup> *ibid* 1897.

<sup>9</sup> Régibeau, de Coninck and Zenger (n 3) 5.

<sup>10</sup> Katrin Hussinger and Franz Schwiebacher, 'The Market Value of Technology Disclosures to Standard Setting Organizations' (2015) 22(4) Industry and Innovation 321, 323.

<sup>11</sup> Keith Maskus and Stephen A Merrill (eds), *Patent Challenges for Standard-Setting in the Global Economy: Lessons from Information and Communications Technology* (National Academies Press 2013) 24.

<sup>12</sup> Ashish Bharadwaj, Vishwas H Devaiah and Indranath Gupta (eds), *Complications and Quandaries in the ICT Sector: Standard Essential Patents and Competition Issues* (Springer 2018) 141.

<sup>13</sup> Damien Geradin and Miguel Rato, 'Can Standard-Setting Lead to Exploitative Abuse: A Dissonant View on Patent Hold-Up, Royalty Stacking and the Meaning of Frand' (2007) 3 Eur Competition J 101, 104.

<sup>14</sup> Jason R Bartlett and Jorge L Contreras, 'Rationalizing FRAND Royalties: Can Interpleader Save the Internet of Things?' (2017) 36(2) The Review of Litigation 285, 287.

<sup>15</sup> *ibid*.

Finally, it is essential to distinguish between open and closed or proprietary standards, the latter being those whose technology is protected by patent rights<sup>16</sup>. The patents on a technology covered by a standard, where it is impossible to design around them, are described as Standard Essential Patents (SEPs)<sup>17</sup>. In the Smartphone industry, closed standards are the rule. Similarly, as the number of patents granted for the IoT increases year after year<sup>18</sup>, including SEPs in interoperability standards has become unavoidable. I submit that this trend is alarming since closed standards give an enhanced monopoly to SEP holders, who may abuse of their rights. To rebalance the position of implementers and developers, most SSOs have developed Intellectual Property rights (IPR) policies<sup>19</sup>.

There is considerable variation among the SSO's IPR policies<sup>20</sup>; however, most organizations have incorporated rules on disclosure and licensing. On the one hand, regarding disclosure, SSOs require participants to identify *ex ante*, before the standard is adopted, their SEPs over any technology relevant to it<sup>21</sup>. However, most IPR policies lack clarity as to the definition of essentiality, the level of precision with which the patent must be identified (blanket disclosure, individual disclosure, identification of the specific claims involved, Etc.), the precise moment of disclosure, and whether this information must be updated<sup>22</sup>. On the other hand, most SSOs require their participants to give the undertaking to license their SEPs on Fair Reasonable and Non-Discriminatory terms<sup>23</sup>, FRAND in shorthand. Nevertheless, SSOs do not define what FRAND means, and scholars have no agreement on the precise significance of its components<sup>24</sup>. In the author's opinion, these deficiencies have led to a trend of increasing litigation in the field of SEP licensing<sup>25</sup>.

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<sup>16</sup> Patrick D Curran, 'Standard-Setting Organizations: Patents, Price Fixing, and Per Se Legality' (2003) 70(3) *The University of Chicago Law Review* 983, 990.

<sup>17</sup> Akins (n 1) 580; Bharadwaj, Devaiah and Gupta (n 12) 5; Gastón Llanes, 'Ex-ante Agreements and FRAND Commitments in a Repeated Game of Standard-Setting Organization' [2018] *Springer Nature* 159, 160 <<https://doi.org/10.1007/s11151-018-9647-7>> accessed 21 March 2021; Maskus and Merrill (n 11) 38; WIPO Secretariat, *Patent Pools and Antitrust – A Comparative Analysis* (WIPO, 2014) 5.

<sup>18</sup> Guido Noto la Diega, 'Internet of Things and Patents: Towards the IoT Patent Wars?' (2017) 3(2) *TFM* 47, 48-62; Maskus and Merrill (n 11) 16.

<sup>19</sup> Lemley (n 7) 1904.

<sup>20</sup> *ibid.*

<sup>21</sup> Régibeau, de Coninck and Zenger (n 3) 47-49.

<sup>22</sup> Maskus and Merrill (n 11) 4.

<sup>23</sup> Lemley (n 7) 1906.

<sup>24</sup> *ibid.*

<sup>25</sup> Curran (n 16) 992.

Thus, I submit that the deficiencies of the current standardization and SEP licensing models have led to an unprecedented increase in litigation. The so-called smartphone wars took billions of dollars to the belligerent parties, billions that were not invested in R&D or further standardization. Now, scholars have started referring to the IoT wars as the potential sequel to the smartphone wars<sup>26</sup>. In looking for alternative mechanisms for dispute resolution, both the European Union (EU) and the United States (US) have encouraged the revival of patent pools as the perfect complement for the activity of SSOs<sup>27</sup>. Nevertheless, the literature has been limited to pointing out some of the benefits that pools could bring; there is no comprehensive study on whether they would solve all the problems in the SSOs' IPR policies that lead SEP holders and implementers to litigation. Intending to avoid IoT wars, I have identified the most critical market failures leading to litigation over SEPs (chapter 2), demystified patent pools as the ultimate solution (chapter 3), and elaborated a comprehensive proposal to reduce litigation over SEPs under FRAND commitments (chapter 4).

## II. The market failures causing litigation over SEPs

In order to avoid the IoT wars, the author has identified five main types of market failures that lead to litigation, three of them arising out of the conduct of SEP holders, one coming from the attitude of SEP implementers, and the latter being inherent to the IoT. The existing literature lacks a comprehensive study dealing with all of them, and fragmentation has resulted in inconsistencies regarding their denomination and definition. The author has filled that void in this chapter by delineating each deficiency and linking them to their roots in the SSOs' IPR policies. Furthermore, the author submits potential solutions that will be developed in the fourth chapter.

### 1. Patent hold up

Patent hold up is the market failure *par excellence*. A good example of this strategy is *Microsoft Corp. v. Motorola, Inc*<sup>28</sup>. Motorola owned patents essential to two standards

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<sup>26</sup> Noto la Diega (n 18) 17.

<sup>27</sup> Department of Justice and Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property* (United States 2017) 30; *Guidelines on the application of Article 101 of the Treaty on the Functioning of the European Union to technology transfer agreements* [2014] OJ C89/3 [117].

<sup>28</sup> *Microsoft Corp. v. Motorola, Inc.*, (W.D. Wash. Apr. 25, 2013).



implemented by Microsoft in its video gaming consoles. The first was the WiFi WLAN standard (802.11), developed by the Institute of Electrical Electronics Engineers (IEEE), and the second was a video coding standard (H.264) erected by the International Telecommunication Union (ITU). Although Motorola had committed to license in RAND terms with the two SSOs, it required Microsoft to pay a 2,25% royalty, equivalent to 3-4,5 dollars per unit. Microsoft interpreted this rate as an attempt by Motorola to kick them out of the market, so they brought the case to court. The tribunal upheld Microsoft's claim and concluded that the due royalties were limited to less than 0,555 cents per unit for the 802.11 standard and 0,8 cents per unit for the H.264. Thus, patent hold up refers to a situation in which the SEP holder *ex post*, after its technology has been introduced to the standard, demands unreasonably high royalties that capture not only the value of the patented technology but also the cost of switching to another standard for locked in implementers<sup>29</sup>.

In the author's view, the origin of this problem can be traced to the vague definition of FRAND provided by most SSOs, which have not defined what 'fair', 'reasonable' and 'non-discriminatory' mean in practice<sup>30</sup>. Furthermore, there is no widespread consensus among scholars as to the meaning of these three concepts. In the following paragraphs, the author has tried to put light on these notions.

Firstly, little attention has been paid to the notion of 'fairness'. In the US, the acronym RAND is more common than the European FRAND, even if both nomenclatures are considered synonyms. As a result, American literature does not give insights into its meaning. Furthermore, even in the EU, scholars have not paid attention to the notion of 'fair'. Most studies are focused on the meaning of the other two components. In this regard, I submit that the notion of FRAND should be rephrased as RAND since the element of 'fair' does not give any input to its meaning. Consequently, this legal opinion will focus on the next two concepts.

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<sup>29</sup> Jorge L Contreras, 'A Brief History of Frand: Analyzing Current Debates in Standard Setting and Antitrust through a Historical Lens' (2015) 80 Antitrust LJ 39, 42; Jorge L Contreras, 'A Tale of Two Layers: Patents, Standardization, and the Internet' (2016) 93 Denv L Rev 855, 861; Maskus and Merrill (n 11).

<sup>30</sup> Chryssoula Pentheroudakis and Justus A Baron, *Licensing Terms of Standard Essential Patents: A Comprehensive Analysis of Cases* (European Commission 2017) 10; Joanna Tsai and Joshua D Wright, 'Standard Setting, Intellectual Property Rights, and the role of Antitrust in Regulating Incomplete Contracts' (2015) 80 Antitrust Law Journal 157, 160-161.

Following with the second element, ‘reasonableness’, most scholars agree that the reasonable royalty is the one that reflects the *ex ante* position of the actors, that is, before the standard was adopted, as opposed to *ex post*, where the SEP holder can demand a higher fee due to the incremented value of the technology after being incorporated to the standard<sup>31</sup>. The author subscribes to this theoretical position but acknowledges the difficulties of translating it into practice. In response, in chapter four, the author proposes introducing *ex ante* price caps to fill with meaning the notion of FRAND.

Thirdly, the most uncertain of the elements is that of ‘non-discriminatory’. Scholars have stated that ‘non-discriminatory’ does not mean charging the same royalties to all but requiring similar fees to similarly situated firms. Nevertheless, what similarly situated means is not clear<sup>32</sup>. Given the difficulties in establishing specific guidelines for each implementer’s treatment, the author submits that all implementers should be offered the same royalty rate. In chapter four, the author will propose the mechanism of patent pools to achieve this.

In summary, I submit that the lack of precise meaning of FRAND – especially of ‘reasonable’ – has caused patent hold up. Even if the SEP holders disclose their patent rights and commit themselves to license in FRAND terms, disagreement about the appropriate FRAND fees has resulted in demands for high, non-FRAND-compliant royalties. Consequently, implementers have had to choose among paying the allegedly unreasonable fees; free riding, with the immediate consequence that the SEP holder will ask courts for an injunction; or even suing first for the courts to determine what should

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<sup>31</sup> Bharadwaj, Devaiah and Gupta (n 12) 70; Carl Shapiro and Hal R Varian, *Information Rules: A Strategic Guide to the Network Economy* (Harvard Business School Press 1999) 241; Dennis W Carlton and Allan L Shampine, ‘Patent Litigation, Standard-Setting Organizations, Antitrust, and FRAND’ (2014) 22 *Tex Intell Prop LJ* 223, 230; Mark A Lemley and Carl Shapiro, ‘A Simple Approach to Setting Reasonable Royalties for Standard-Essential Patents’ (2013) 28(2) *Berkeley Technology Law Journal* 1135, 1140; Roger G Brooks, ‘SSO Rules, Standardization, and SEP Licensing Economic Questions from the Trenches’ (2013) 9(4) *Journal of Competition Law & Economics* 859, 873.

<sup>32</sup> David Arsego, ‘Problem with Frand: How the Licensing Commitments of Standard-Setting Organizations Result in the Misvaluing of Patents’ (2015) 41 *Brook J Int’l L* 257, 267; Philip B Nelson, ‘Patent Pools: An Economic Assessment of Current Law and Policy’ (2007) 38 *Rutgers LJ* 539, 567.

be meant by FRAND<sup>33</sup>. However, the answer given by the courts has diverged in the EU and the US.

On the one hand, the author states that the EU has taken a vague and mistaken approach. The Court of Justice of the European Union (CJEU) has been reluctant to establish guidelines for what should be considered FRAND for SEPs<sup>34</sup>. Instead, it has given a solution employing antitrust law. Since the strategy of patent hold up depends on the availability of injunctive relief to compel implementers to pay non-FRAND rates, the CJEU in *Huawei v. ZTE*<sup>35</sup> has opted for banning this strategy once and for all. Although it has not entirely erased injunctive relief, it has stated very restrictive conditions as to when a SEP holder under a FRAND commitment will qualify for the grant of an injunction<sup>36</sup>. In the author's opinion, the judgment is flawed. First, it has not addressed the main problem of FRAND licensing, that is, the determination of the FRAND fees. Second, the solution given to avoid patent hold up – limiting the availability of injunctive relief – has broken the balance between implementers and developers. Establishing a too high threshold for developers has enhanced an additional market failure, patent hold out, which will be explained below. Consequently, the author considers the CJEU erred in *Huawei v. ZTE*.

On the other hand, the author believes that the US has dealt more in-depth with the issue. Its approach is to be praised and emulated because it has achieved a balance between developers and implementers.

Firstly, regarding injunctive relief, the author considers that the US is currently in a similar position to the EU. At first, *eBay v. MercExchange*<sup>37</sup> was issued, which is to date the most authoritative case guiding when an injunction should be granted. It sets forward four general requirements – irreparable injury, inadequacy of other remedies, balancing

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<sup>33</sup> Jurgita Randakevičiūtė, *The Role of Standard-Setting Organizations with Regard to Balancing the Rights Between the Owners and the Users of Standard-Essential Patents* (Nomos Verlagsgesellschaft mbH 2015) ch 3, 37.

<sup>34</sup> Alison Jones, 'Standard-Essential Patents: Frand Commitments, Injunctions and the Smartphone Wars' (2014) 10(1) *European Competition Journal* 1, 31 <<https://doi.org/10.5235/17441056.10.1.1>> accessed 21 March 2021.

<sup>35</sup> Case C-170/13, *Huawei Technologies Co Ltd v. ZTE Corp, ZTE Deutschland GmbH* [2015] OJ C302/2.

<sup>36</sup> *ibid.*

<sup>37</sup> *eBay Inc v. MercExchange, LLC*, 547 US 388 (2006).

hardships and public interest – that do not focus on SEP licensing<sup>38</sup>. Furthermore, they are basic demands, the court to make sure that the granted remedy is proportional to the damage caused. Thus, in *eBay v. MercExchange* injunctive relief’s availability is not limited as in *Huawei v. ZTE*. However, the US Courts issued an additional judgment regarding the specific context of SEP licensing, *Apple, Inc. v. Motorola, Inc.*<sup>39</sup>. Concerning the second requirement set forward by *eBay v. MercExchange* – proving that monetary damages are inadequate –, it determined that none of the parties had proven that damages were not an adequate remedy, and thus, injunctive relief was not available. Furthermore, it stated that a FRAND royalty was the appropriate relief to which the SEP holder would be entitled, suggesting that courts would grant monetary relief in all SEP cases. According to the author, this holding leaves developers in a similar position on both sides of the Atlantic. *Apple, Inc. v. Motorola, Inc.* should be condemned for the same reasons as *Huawei v. ZTE*, for reinforcing patent hold out.

Secondly, as opposed to the CJEU, US courts have given guidelines as to how FRAND royalties should be determined. The most authoritative case is *Georgia-Pacific v. Plywood*<sup>40</sup>, which outlined a series of factors to be considered when accomplishing this task. It is an exemplary case that has helped reduce litigation in the US by easing the RAND calculation for courts, developers and implementers. Moreover, *Ericsson v. D-Link*<sup>41</sup> set guidelines on its implementation to FRAND cases. The author agrees with the holding of this judgment and considers that it has successfully restored the balance between developers and implementers that *Apple, Inc. v. Motorola, Inc.* had broken. On the one hand, it gave specific instructions as to which parameters must be taken into account in determining the FRAND rate to ensure that it only comprises the value of the patent *ex ante*, before the inclusion to the standard<sup>42</sup>. Had the sentence stopped there, the author submits that it would have been considered pro-implementer, and it would have worsened the unbalance under *Apple, Inc. v. Motorola, Inc.* However, the court decided to include a pro-developer measure by strengthening the requirements to be able to challenge the FRAND nature of an offer. Precisely, it required evidence of “the record of patent hold-up and royalty stacking in relation to both the RAND commitment at issue

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<sup>38</sup> *ibid.*

<sup>39</sup> *Apple, Inc. v. Motorola, Inc.*, 869 F. Supp. 2d 901 (N.D. Ill. 2012).

<sup>40</sup> *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970).

<sup>41</sup> *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201.

<sup>42</sup> *ibid* at 1235.

and the specific technology referenced therein”<sup>43</sup>. In the author’s view, *Ericsson v. D-Link* is an excellent first step towards restoring the SEP holder-implementer equilibrium and a good illustration of how the European framework could be easily improved by a judgment of the CJEU in this direction.

In conclusion, the US and the EU have different approaches regarding patent hold up. The author believes that the American stance is preferable since it maintains the balance between implementers and developers by strengthening the requirements to grant an injunction and challenge the FRAND nature of a fee. However, the author holds that it is worrisome that patent hold up has been an issue in both jurisdictions, and making tribunals less accessible should not be the final solution. To avoid litigation, it is necessary to improve the SSOs’ IPR policies and introduce measures that prevent patent hold up from the root. In this sense, I will propose the inclusion of *ex ante* price caps in chapter four.

## 2. Patent ambush or under-declaration

Patent ambush is a variation of patent hold up that has received increasing attention. Its most well-known example is the Rambus case. In brief, Rambus was a member of the Joint Electron Device Engineering Council (JEDEC) when the Dynamic Random Access Memory (DRAM) standard was developed. During this time, Rambus hid from the SSO patents relevant to the standard. After its adoption, the company left the SSO and started to require non-FRAND fees to implementers. Thus, the patent ambush strategy can be divided into two stages. *Ex ante*, under-declaration occurs; the SEP holder hides its truly essential patents to the SSO to avoid being bound by FRAND commitments<sup>44</sup>. As a consequence of this deceit, implementers incorporate the standard to their products without knowing the actual costs it will entail for being protected by patents<sup>45</sup>. *Ex post*, once the standard has been put into effect, the patent ambush happens; the SEP holder reappears and demands high royalties capturing the value of the standard and the switching costs for those implementers that are locked in by their investments<sup>46</sup>. Due to

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<sup>43</sup> *ibid.*

<sup>44</sup> Björn Lundqvist, *Standardization under EU competition rules and US antitrust laws the rise and limits of self-regulation* (Edward Elgar Publishing 2014) ch 6, 300-301; Randakevičiūtė (n 33) 27.

<sup>45</sup> Mark A Lemley and Timothy Simcoe, ‘How Essential Are Standard-Essential Patents’ (2019) 104 *Cornell L Rev* 607, 630; Régibeau, de Coninck and Zenger (n 3) 14.

<sup>46</sup> Lundqvist (n 44) 300-301; Nelson (n 32) 8.

the clear division in these two stages, this market failure is referred to as under-declaration or patent ambush interchangeably.

In the author's opinion, the roots of patent ambush can be traced to the vagueness of SSOs' IPR policies in dealing with disclosure<sup>47</sup>. Precisely, the vague definitions of essentiality and the lack of precision about when patents must be disclosed are the drivers of this market failure.

Regarding the first, essentiality, a general definition has been given in the introduction to understand what SEP means in broad terms. However, essentiality is a term defined – or rather under-defined – by each SSO in a different manner. These organizations adopt one of the following three definitions of essentiality: core essentiality, the patented technology is essential to the functionality of the standard; non-core essentiality, the patented technology is essential only for an optional function of the standard; and commercially essentiality, which means that there are alternatives to the used technology, but it is not possible to market them because they are too burdensome for non-technological reasons, such as being too expensive<sup>48</sup>. As long as the SSO does not clearly state which definition of essentiality it adopts, patent holders cannot know which patents they should disclose. In the author's opinion, to fully capture the problem of patent ambush, it is necessary to adopt the widest of the definitions, that is, that of commercial essentiality, as explained in chapter four.

Second, even if the definition of essential is clear, SSOs have vague provisions regarding when patents should be disclosed. I hold that the ideal would be to disclose as earliest as possible, manufacturers to know the standard's costs in advance and make an informed decision as to its implementation. Nevertheless, as standards keep evolving even after their adoption, a patent considered essential may not have such a character after some time; an early disclosure may entail unnecessary expenses for developers<sup>49</sup>. However, I

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<sup>47</sup> Randakevičiūtė (n 33) 27.

<sup>48</sup> Jay P Kesan and Carol M Hayes, 'FRAND's Forever: Standards, Patent Transfers, and Licensing Commitments' (2014) 89 Ind LJ 231, 241.

<sup>49</sup> Akins (n 1) 584-591; David J Teece, 'Patent Counting and the "Top-down" Approach to Patent Valuations: An Economic and Public Policy Appraisal of Reasonable Royalties' (2020) 5 Criterion J on Innovation 157, 171.

consider that patent ambush will not be prevented unless an early disclosure is required. As long as blanket disclosures are allowed, this will not be too burdensome for developers.

Thus, the author believes that the lack of precision as to what essential means and when the SEPs must be disclosed have enhanced patent ambush strategies. Consequently, ambushed implementers have resorted to litigation to seek FRAND fees. In this sense, it is interesting to note the different paths that the Rambus case followed in the US and the EU.

On the one hand, the Rambus case, *Rambus Inc. v. FTC*, was litigated in the US<sup>50</sup>. In the author's view, this case exemplifies how the existing regulation cannot cope with the market failures taking place in SEP licensing and legal amendments are necessary. The author considers that the court's argumentation was flawless: since there was no contractual bond in the form of a FRAND commitment because Rambus had left the SSO, they could not oblige the company to license on FRAND terms<sup>51</sup>. However, as a result, a clear case of patent ambush was left free of liabilities<sup>52</sup>. Thus, I consider that it is necessary to find a legal tool to make outsider ambushers accountable.

Meanwhile, I submit that the EU gave a more satisfactory solution to this clear-cut patent ambush case. The European Commission sent a statement of objections to Rambus for its alleged antitrust violations, which accepted a settlement where the licensing fees for its patents were eliminated or reduced<sup>53</sup>. In the author's view, it was wise to resort to antitrust law to find a solution since it does not depend on a commitment to license on FRAND terms. Nevertheless, it is necessary to find that the SEP holder is in a dominant position, which may not in all instances be as evident as in the Rambus case. In the author's opinion, it is necessary to seek another solution to avoid reliance on antitrust law.

In sum, I submit that the scrutiny of patent ambush in the EU has proven to be more successful than in the US, but none of the approaches fully captures the problem. Consequently, I hold that alternative solutions must be found to stop the patent ambush

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<sup>50</sup> *Rambus Inc. v. FTC*, 522 F.3d 456 (2008).

<sup>51</sup> *ibid.*

<sup>52</sup> Robert J Levinson and Stanley Besen, 'Lessons from *FTC v. Rambus*' [2010] *Icarus* 17, 22.

<sup>53</sup> *Rambus* (Case COMP/38.636) Commission Decision 2010/C 30/09 [2010] OJ C30/17.

and the litigation stream. It is necessary to amend the SSOs' IPR policies. A possible measure would be the requirement that non-disclosed patents are licensed royalty-free, as the author proposes in chapter four. Furthermore, I consider that the existing literature is not paying enough attention to the possibility of the patent ambush being executed by non-members of the SSO. Participation in SSOs is voluntary, and their IPR policies cannot bind non-members, so there will be cases in which the existence of a patent over the standardized technology is revealed *ex post* by an outsider. To solve patent ambush by outsiders, the amendment of the SSOs' IPR policies would not be enough. In chapter four, I will tackle the helpfulness of compulsory licensing in these regards.

### 3. Over-declaration

Over-declaration is the most widespread market failure. There is no agreement on the average rate of over-declaration, but some estimations go as far as to say that only 10% of the declared patents are indeed SEPs<sup>54</sup>. The author considers that the recent UK case *Unwired Planet v. Huawei* is one of its best illustrations<sup>55</sup>. Unwired Planet argued that it owned five patents essential to the 2G-GSM, 3G-UMTS and 4G-LTE standards, which Huawei had implemented in its products. In a long process of negotiations, both sides had made different license offers, but no agreement was reached. Consequently, Unwired Planet brought the case to trial, arguing that its patents were valid and essential, while Huawei stated the opposite. In the High Court, only two of the five patents were considered valid SEPs<sup>56</sup>. Thus, over-declaration could be defined as disclosing a patent as essential for a standard when it is not genuinely essential<sup>57</sup>.

In the author's opinion, the SSOs' IPR policies have three main flaws leading to this trend: the vague definitions of essentiality, the lack of precision as to when patents must be disclosed, and the lack of essentiality checks. As the first two have already been tackled concerning patent ambush, this section will focus on the latter.

The most crucial factor why over-declaration is happening is the lack of essentiality checks by the developers or the SSOs. On the one hand, SEP disclosures are voluntary

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<sup>54</sup> McDonagh and Bonadio (n 2) 22.

<sup>55</sup> *Unwired Planet International Ltd v. Huawei Technologies Co Ltd* [2017] EWHC 711 (Pat).

<sup>56</sup> *ibid.*

<sup>57</sup> Akins (n 1) 579; Lemley and Shapiro (n 31) 1154.



for companies; they are not bound by any laws to reveal their patents in a developing standard. On the other hand, the by-laws of SSOs do not always request their participants to perform patent searches to find which are truly essential<sup>58</sup>. Even when they do, they do not make independent checks to verify their SEP<sup>59</sup>. Why none of these actors carries out essentiality checks? In the opinion of the author, because it is infeasible in practice. Informed declarations of SEPs are very expensive, especially considering that one standard may encompass thousands of patents and that a company's patent portfolio may be extensive. There is general agreement among scholars that the essentiality assessment of a single patent family can cost up to 10.000 euros<sup>60</sup>. Meanwhile, the author points out the inexpensiveness of making blanket disclosures – the company informs the SSO that it holds patents over the standard without individualizing those patents. It is vital to bear in mind that carrying out this costly analysis does not report any economic benefits to developers; conversely, they are paid in proportion to the number of patents they hold over the standard<sup>61</sup>. Furthermore, under-declaration can lead to being fined or deprived of the right to an injunction for violations of antitrust laws<sup>62</sup>, while over-declaration can bring treble or punitive damages for willful infringement<sup>63</sup>. The author submits that the expensiveness of the essentiality checks and the economic incentives to over-declare are strengthening this problem.

Over-declaration leaves implementers with two options, paying royalties for the non-essential patents that have been bundled to the standard or going to court for a finding of non-essentiality. Many implementers have resorted to the latter option, given the high level of over-declaration claimed by scholars. The research conducted by Lemley and Simcoe has proven that implementers are generally successful in their actions to disqualify SEPs<sup>64</sup>. Consequently, there is increasing litigation for challenging the

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<sup>58</sup> Joseph Farrell and others, 'Standard setting, patents, and hold-up' (2007) 74(3) *Antitrust Law Journal* 603, 626.

<sup>59</sup> Zhang Ping, 'An Analysis on Antitrust Regulation of Patent Pools' (2008) 1 *Peking U J Legal Stud* 220, 226.

<sup>60</sup> Jorge L Contreras, 'Fixing Frand: A Pseudo-Pool Approach to Standards-Based Patent Licensing' (2013) 79 *Antitrust LJ* 47, 77; Régibeau, de Coninck and Zenger (n 3) 24.

<sup>61</sup> Mathias Dewatripont and Patrick Legros, "'Essential' Patents, FRAND Royalties and Technological Standards' (2013) 61(4) *The Journal of Industrial Economics* 913, 916.

<sup>62</sup> Bartlett and Contreras (n 14) 301; Kristen Jakobsen Osenga, 'Ignorance over Innovation: Why Misunderstanding Standard Setting Organizations Will Hinder Technological Progress' (2018) 56 *U Louisville L Rev* 159, 185; Lemley and Simcoe (n 7) 629.

<sup>63</sup> Akins (n 1) 581.

<sup>64</sup> Lemley and Simcoe (n 7) 618-619.

essentiality of patents<sup>65</sup>. Thus, SEP holders are between the hammer and the anvil, having to choose to expend their money *ex ante* in essentiality checks, or *ex-post* in litigation, for an aim that does not bring them benefits at all. It must be reminded that the ideal SSOs' IPR policies do not establish a balance that tips for the implementers but instead finds an equilibrium between the interests of all parties. Thus, the author submits that finding a system to make the *ex ante* performance of essentiality checks economically viable is necessary. For such an aim, the involvement of SSOs is essential; their economic and human capital is indispensable.

#### 4. Patent hold out or reverse hold up

Patent hold out or reverse hold up is a market failure that is recently receiving attention. The Netherlands case *Philips v. Asustek Computers*<sup>66</sup> is a prominent example in the author's view. Philips owned patents essential to the 3G/UMTS and 4G/LTE standards, which Asus had implemented in its mobile phones. However, Asus resorted to a strategy of delaying the negotiations. Philips had to initiate them, even if a company with the trajectory of Asus could not oversee the need to get the licenses for the SEPs involved in its products. Moreover, Asus did not bring qualified personnel to the negotiations to further delay the negotiations for lack of understanding. Consequently, Philips went to court to seek an injunction. Meanwhile, Asus used arguments such as that Philips had not explained why its offer was considered FRAND. Thus, patent hold out or reverse hold up refers to the refusal by the implementer to pay the license fees to the SEP holder by arguing that the offer is not FRAND compliant<sup>67</sup>. This strategy uses the threat of costly and lengthy litigation to avoid paying royalties, reduce the license fee, or delay the payment until forced by the courts<sup>68</sup>.

In the author's view, the driver of patent hold out is the same as patent hold up, the vagueness of the notion of FRAND, as it has been developed above. Furthermore, the

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<sup>65</sup> Anne Layne-Farrar and Koren W Wong-Ervin, 'Methodologies for calculating FRAND damages: an economic and comparative analysis of the case law from China, the European Union, India, and the United States' (2017) 8(2) *Jindal Global Law Review* 127, 135.

<sup>66</sup> *Koninklijke Philips N.V. v. Asustek Computers INC*, District Court of the Hague, 2017, Case No. C 09 512839 /HA ZA 16-712.

<sup>67</sup> Régibeau, de Coninck and Zenger (n 3) 20.

<sup>68</sup> *ibid.*

author submits that the measures that European and American courts have put in place to stop patent hold up have reinforced patent hold out.

On one side, in the context of the EU, the decision in *Huawei v. ZTE*<sup>69</sup> has been criticized by the author for pushing patent hold out. Since the judgment has limited the availability of injunctive relief, the balance has been tipped for implementers<sup>70</sup>. Nevertheless, the author points out that it is not all black or white; the judgment already raised awareness of the potential reverse hold up that it could entail and stated that "delaying tactics"<sup>71</sup> would not be accepted. In this sense, the author considers the outcome of *Philips v. Asustek Computers* worth mentioning. This case shows that, although *Huawei v. ZTE* could push patent hold out, this outcome will not take place if its rationale is correctly interpreted. *Philips v. Asustek Computers* was an EU case; thus, the grant of the injunction demanded by Philips was subject to fulfilling the conditions set forward by *Huawei v. ZTE*. Even if these requirements tip the balance towards implementers, this case shows that *Huawei v. ZTE* will not stop judges from granting an injunction in clear-cut patent hold out cases. In fact, the court rejected Asus' claims. The judges accepted Philips' offers as FRAND. Furthermore, the tribunal detailed the delaying tactics used by Asus and banned by *Huawei v. ZTE*. As a result, the court ended up granting the injunction. Although this aftermath raises hopes, the author submits that the notion of 'delaying tactics' in *Huawei v. ZTE* is not transparent enough to assist judges on less clear patent hold out cases. Consequently, the author submits that it is necessary to establish a mechanism by which the FRAND fee is established before litigation.

On the other side, in the US, *eBay v. MercExchange* could potentially lead to the same outcome as *Huawei v. ZTE*, restraining the availability of injunctive relief in the context of SEP licensing. However, *Ericsson v. D-Link* shifted the American judicial landscape by strengthening the requirements to challenge the FRAND nature of a royalty fee offered by a developer. As the author has stated above, this decision was paramount in restoring the balance between developers and implementers. However, additional measures to make sure that patent hold out does not occur should always be welcomed.

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<sup>69</sup> *Huawei v. ZTE* (n 35).

<sup>70</sup> Haris Tsilikas, *Antitrust Enforcement and Standard Essential Patents: Moving beyond the FRAND Commitment* (Nomos Verlagsgesellschaft mbH 2017) 28; Jakobsen (n 62) 174.

<sup>71</sup> *Huawei v. ZTE* (n 35).

In conclusion, in the author's view, the US is better positioned to avoid the challenge of patent hold out. Meanwhile, in the EU, *Huawei v. ZTE* must be complemented with additional measures that bring back the equilibrium between developers and implementers. In this sense, the author will study the mechanism of compulsory licensing to see whether it can act not only to the advantage of implementers but also of developers.

## 5. Royalty stacking

Royalty stacking is a market failure that is not attributable to SEP holders and implementers; instead, it is inherent to the advance of technology and, thus, to the IoT. Since the grant of technological patents has increased year by year, a patent thicket has been created in many industries. This was the case of the smartphone patent thicket (*See Annex V*) and is to be the case of the IoT. A patent thicket refers to the situation in which a single product is protected by thousands of patents belonging to different companies. The fragmentation of ownership requires implementers to negotiate and pay several individual licenses<sup>72</sup>. Consequently, royalties stack upon each other – thus the name royalty stacking – and their cumulative effect leaves the standard too expensive to be practicable<sup>73</sup>.

In the author's view, two flaws of the SSOs' IPR policies explain why this phenomenon is taking place, the under-definition of FRAND and the lack of enforcement mechanisms.

On the one hand, as the author has already mentioned, FRAND is left undefined by most SSOs. Although there is agreement among scholars that the reasonable royalty should not capture the value added by incorporating to the standard, there is only one piece of literature demanding that the assessment of reasonableness considers the aggregate royalty rate<sup>74</sup>. In its absence, there could be instances in which an individual assessment of the licensing fees could pass the FRAND test, but the aggregate renders the standard

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<sup>72</sup> Shapiro (n 31) 119.

<sup>73</sup> Josh Lerner and Jean Tirole, 'Public Policy toward Patent Pools' (2007) 8 *Innovation Policy and the Economy* 157, 159; Lemley and Shapiro (n 31) 1140.

<sup>74</sup> Srividhya Ragavan, Brendan Murphy and Raj Dave, 'Frاند v. Compulsory Licensing: The Lesser of the Two Evils' (2016) 14 *Duke L & Tech Rev* 83, 91.

unworkable in practice<sup>75</sup>. In the author's opinion, the accumulated royalty must be considered in the FRAND assessment.

On the other hand, a new flaw must be added. SSOs are toothless; they do not include any licensing mechanism by which implementers can get a single license for all the patents at once. Each implementer has to negotiate its licensing terms individually with each SEP holder, and SSOs do not have any means by which they can extend that license to other willing implementers. As a result, they have to pay for every license plus all the individual negotiation processes, so the total costs are high. In the author's view, patent pools would solve this problem, as developed below.

In sum, the author submits that due to the lack of aggregate royalty considerations in FRAND and the absence of enforcement mechanisms in the SSOs, implementers have had to resort to litigation to moderate the aggregate license fees. However, courts have followed different pathways at each side of the Atlantic.

On the one hand, the EU has a very vague and negligent approach to royalty stacking. Since it has avoided establishing guidelines for what should be considered FRAND, it has not given indications as to whether the aggregate royalties should be considered in determining the individual value of the SEPs. In the author's opinion, the standardization process would be benefited from a clear judgment of the CJEU on how FRAND ought to be calculated, in which the aggregate royalty fees are considered.

On the other hand, the author considers that the US has a more comprehensive approach but not an all-encompassing solution to royalty stacking. The courts have given guidelines on the meaning of FRAND, paying attention to the existence of royalty stacking. However, two different approaches have been put forward. First, in *Microsoft v. Motorola*<sup>76</sup>, the court did not ask the plaintiff to prove royalty stacking in practice; the potential aggregate royalty was estimated by presuming that every patent holder would set the same royalty fee as the defendant<sup>77</sup>. Nevertheless, this approach was rejected

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<sup>75</sup> Bartlett and Contreras (n 14) 294.

<sup>76</sup> *Microsoft Corp v. Motorola Inc*, 696 F 3d 872 (9th Cir 2012).

<sup>77</sup> Layne-Farrar and Wong-Ervin (n 65) 130-131.

in *Ericsson v. D-Link*<sup>78</sup> and *CISCO v. CSIRO*<sup>79</sup> in favor of a requirement that evidence should be handed as to the actual aggregate fees paid by implementers to assess whether they were excessive<sup>80</sup>. Thus, royalty stacking is being assessed in US courts, although the changes in the jurisprudence show that it is not a settled issue. In addition, the author points out that the suitability of the US approach depends on the existence of a FRAND commitment. Consequently, even if a FRAND assessment considered the sum of aggregate royalties, an outsider to the SSO would not be bound by FRAND. Thus, the author holds that a compulsory licensing mechanism that considers the aggregate license fee is needed.

In conclusion, royalty stacking has not been considered by the Court of Justice of the European Union and the American approach is not capable of capturing every instance of royalty stacking. In order to avoid litigation, I consider that patent pools can be a useful tool. However, since pools are voluntary by nature, they will not incorporate all the patents that may be necessary to implement the standard. Consequently, to fully end up with royalty stacking, it is necessary to make compulsory licensing sensitive to this problem, in the way that I will explain in the fourth chapter.

All in all, increasing litigation over SEPs has been caused by five market failures: patent hold up, ambush, over-declaration, hold out, and royalty stacking. These are the result of several flaws in the SSOs' IPR policies, namely, the vagueness of the definition of essentiality, the lack of precision as to when patents must be disclosed, the inexistence of essentiality checks, the absence of a definition of FRAND, and the lack of licensing and enforcement mechanisms. As a response, the EU and the US have encouraged the revival of patent pools as the perfect complement to fix the problems in SSOs<sup>81</sup>. However, in the next chapter, the author will assess why pools are not a natural fit for SSOs; they are helpful to solve some of the market failures that have been identified, but not all of them.

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<sup>78</sup> *Ericsson v. D-Link* (n 41).

<sup>79</sup> *CSIRO v. CISCO Systems, Inc.* 809 F.3d 1295 (Fed. Cir. 2015).

<sup>80</sup> Layne-Farrar and Wong-Ervin (n 65) 130-131.

<sup>81</sup> Department of Justice and Federal Trade Commission (n 27) 30; *Guidelines on the application of Article 101*.

### III. Patent pools: an imperfect solution

Patent pools are multilateral agreements between two or more SEP holders to license their patents over the standard among each other and or to third parties in exchange for a licensing fee<sup>82</sup>. They can be limited to a contract or lead to creating a corporation to handle the SEPs<sup>83</sup>. The type of patent pool at stake concerning the market failures mentioned above is the latter, a corporation whose object is to create a portfolio comprising all SEPs for a standard and offer a single license fee for the whole bundle. Thus, SSOs and patent pools have different but complementary roles<sup>84</sup>, the first look to establish standards, and the latter is a means to facilitate their implementation<sup>85</sup>. Nevertheless, most SSOs do not have any mechanism to facilitate the formation of patent pools over the standards they create<sup>86</sup>. In this chapter, the author will assess whether it would be convenient to introduce patent pools to the tasks carried out by SSOs by analyzing whether this tool would end up with the market failures caused by their IPR policies and, thus, with the contentious trend.

#### 1. The need for essentiality checks

In the US and the EU, essentiality checks are compulsory in the formation of a patent pool to avoid antitrust liabilities. Although I acknowledge that the requirement of essentiality checks renders the pooling process much more expensive, I hold that it is the right approach to maintain the necessary level of competition in the market while the positive effects of cooperation among competitors are preserved.

In the US, the relation between patent pools and antitrust laws can be divided into three periods. When the first patent pools emerged in the mid 19<sup>th</sup> Century, antitrust laws had

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<sup>82</sup> Daniel Quint, 'Pooling with Essential and Nonessential Patents' (2014) 6(1) American Economic Journal: Microeconomics 23, 23; David L Podell and Benjamin S Kirsh, 'Patent Pools and the Anti-Trust Laws' (1927) 13(8) American Bar Association Journal 430, 431; Jakobsen (n 62) 194; Steven C Carlson, 'Patent Pools and the Antitrust Dilemma' (1999) 16 Yale J on Reg 359, 367-368; WIPO Secretariat (n 17) 1.

<sup>83</sup> Lemley (n 7) 1950-1951; Nelson (n 32) 539; Robert P Merges and Michael Mattioli, 'Measuring the Costs and Benefits of Patent Pools' (2017) 78 Ohio St LJ 281, 296; Shapiro (n 31) 134.

<sup>84</sup> Jakobsen (n 62) 192.

<sup>85</sup> Lemley (n 7) 1951; Monica Winghart, Brenda O Holmes and Renae Bailey, 'Patent Pools and Not-so-standard Standards' (2012) November ACC Docket 89, 93.

<sup>86</sup> Kesan and Hayes (n 48) 252.

not yet been developed and the first consortiums did not find resistance<sup>87</sup>. Nevertheless, after the Sherman Act was issued in 1890, the relation between patent pools and antitrust laws started to change<sup>88</sup>. The turning point arrived in 1912 when the US Supreme Court held in *Standard Sanitary Manufacturing Co. v. United States* that patent pools could be anti-competitive<sup>89</sup>. It was not until 1995 that the Department of Justice and the Federal Trade Commission created a new set of guidelines where the pro-competitive potential of patent pools was acknowledged<sup>90</sup>. Nevertheless, the guidelines established the firm requirement that essentiality checks must be carried out over all the pooled patents and solely those deemed essential can be introduced to the bundle<sup>91</sup>. Consequently, nowadays, patent pools in the United States must carry out essentiality checks. The author agrees with this stance since it is necessary to ensure that pools are not used for anti-competitive means.

In the EU, patent pools could breach Article 101(1) by restricting competition in the internal market. Nonetheless, Article 101(3) established the grounds under which a potentially anti-competitive act will be allowed. Although patent pools are not covered expressly by the Technology Transfer Regulations and so can be liable under Article 101(1)<sup>92</sup>, the Technology Transfer Guidelines expressly address patent pools establishing that a case-by-case analysis of each patent pool must be made and they will be exempted from Article 101(1) when they cover essential technologies<sup>93</sup>. Since only the patent pools covering solely essential patents will be allowed, essentiality checks are indispensable in the EU. The author considers that this was the right approach. Excluding from scrutiny all patent pools may have ended in permitting harmful collusive practices.

In short, although patent pools are admitted in the US and the EU, essentiality checks are compulsory in both jurisdictions for their valid formation. In the author's view, this is an advantage because it guarantees that there will not be over-declaration for the most important standards for which a pool is achieved. However, the author points out that this

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<sup>87</sup> Winghart, Holmes and Bailey (n 85) 92.

<sup>88</sup> Monica Armillotta, *Technology Pooling Licensing Agreements: Promoting Patent Access Through Collaborative IP Mechanisms* (Nomos Verlagsgesellschaft mbH 2010) ch 3, 73.

<sup>89</sup> *ibid* 74; *Standard Sanitary Mfg. Co. v. United States*, 226 U.S. 20 (1912).

<sup>90</sup> Winghart, Holmes and Bailey (n 85) 92.

<sup>91</sup> *ibid*.

<sup>92</sup> WIPO Secretariat (n 17) 15-17.

<sup>93</sup> *ibid*.



is a disadvantage for developers because, in practice, essentiality checks are an expensive requirement that may not be accessible to all SEP holders. Consequently, the formation of a comprehensive patent pool including all the SEPs may not be economically viable. It is necessary to find a way to make essentiality checks affordable enough, as the author will tackle in the following chapter.

## 2. Preventing royalty stacking

Patent pools are considered by many as the solution to the problem of royalty stacking<sup>94</sup>. The author agrees with this view for the following two reasons. First, they help reduce transaction costs by limiting the necessary negotiations among the interested parties. Second, they introduce considerations as to the aggregate royalty fees to be paid by the implementers.

On the one hand, the author considers that patent pools reduce the transaction costs for both developers and implementers<sup>95</sup>. The first will only need to agree on the licensing terms with the other pool members, but they will not deal individually with each implementer (*See Annex VI*)<sup>96</sup>. The latter will be even in a better position since they will only have to subscribe to the terms offered by the pool without having to negotiate individually with each SEP holder or unite forces with any other implementer to get a lower fee<sup>97</sup>. Many, including the author, understand the reduction of transaction costs as the main objective of patent pools<sup>98</sup>.

On the other hand, patent thickets are not just about transaction costs; they also have to do with aggregate royalty fees, which are not considered by developers when they act individually. In this sense, the author holds that patent pools have the potential to reduce the license fee. *Ad intra*, it is usual to offer the patents to other pool members at a discounted fare, and even royalty-free if the pool is created to avoid or stop ongoing

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<sup>94</sup> Régibeau, de Coninck and Zenger (n 3) 74.

<sup>95</sup> Geradin, Layne-Farrar and Padilla (n 13) 167.

<sup>96</sup> Roger B Andewelt, 'Analysis of Patent Pools under the Antitrust Laws' (1984) 53(3) *Antitrust Law Journal* 611, 616; Winghart, Holmes and Bailey (n 85) 93.

<sup>97</sup> Merges and Mattioli (n 83) 297; WIPO Secretariat (n 17) 9.

<sup>98</sup> Maskus and Merrill (n 11) 57; Merges and Mattioli (n 83) 296; Richard J Gilbert, 'Ties That Bind: Policies to Promote (Good) Patent Pools' (2010) 77(1) *Antitrust Law Journal* 1, 8.

litigation among developers<sup>99</sup>. *Ad vestra*, considerations as to the resulting aggregate royalty lead to a diminished license fee. Developers, in their interest, have to offer a licensee fee that is bearable by implementers. If they do not, they risk losing all revenue after their investment in R&D, getting into the standard, and developing the patent pool. In sum, the author holds that pools ameliorate the challenge of royalty stacking by considering the aggregate license fee.

Thus, the author thinks that patent pools are a proper solution for the problem of royalty stacking not only because they act as a one-stop-shop in which implementers can get all patents together but also because they allow developers to consider the aggregate royalties to be assumed by implementers and moderate them to be affordable.

### **3. The persistence of patent hold up**

In the previous section, the author has concluded that patent pools help reduce the aggregate license fee paid by implementers. Nevertheless, the introduction of aggregate royalty concerns not to leave the license unbearable does not ensure that the individual royalties paid to each pool member will be FRAND. Patent pools do not solve the problem of patent hold up.

On the one hand, the author fears that the developers may be willing to use the power given by the pool to push implementers to their limit and gain royalties over FRAND terms<sup>100</sup>. Consequently, although the pool members are bound by the SSOs' IPR policies to offer a license for their SEPs in FRAND terms, the patent pool will not ensure that a FRAND license is offered at the end of the process. The author reminds us: affordable does not equal FRAND.

On the other hand, the author thinks that the method of dividing the aggregate royalties among the pool members may distort the fairness of the fare. Although the contract or by-laws governing each patent pool can decide the mechanism by which the licensing fees will be distributed, the most popular means is the allocation of royalties depending on the number of patents owned. The higher the number of patents owned, the higher the

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<sup>99</sup> Geradin, Layne-Farrar and Padilla (n 13) 167.

<sup>100</sup> Régibeau, de Coninck and Zenger (n 3) 31.

percentage of royalties to be received<sup>101</sup>. Although this method is not illogic, since all the patents in the pool are essential and thus equally important in theory; in practice, there are ways in which developers try to distort this rule, for example, by filing independent patents for each claim, even if they all relate to the same invention<sup>102</sup>. Consequently, the developer of a fundamental patent for the pool may end up gaining the same as one of an ‘unimportant’ patent, a result that is incompatible with FRAND.

In sum, the author considers that patent pools are not helpful to ensure that the individual royalty fees paid to each developer comply with FRAND terms. The market power given by the formation of the pool and the difficulties in establishing a fair mechanism for the distribution of royalties are flaws to be considered. Patent hold up has to be prevented before the licensing stage. In the author’s opinion, establishing *ex ante* price caps would solve the problem at its inception.

#### **4. The resilience of patent hold out**

Finally, the author considers that hold out strategies may be avoided to a certain extent by patent pools, but not in full.

On the one hand, the author holds that, by grouping all the developers, patent pools prevent implementers from choosing not to pay those developers who do not have the money to resort to litigation. Since they must pay to all of them together, small and medium-size companies are protected by the bigger ones.

However, the author reminds us that pools do not end up with the problem of hold out, since some implementers may challenge the royalty fee offered by the patent pool for arguably not being compliant with FRAND. The patent pool will allow implementers to sue all developers together, so their litigation costs will decrease. Nonetheless, the same rule applies to developers: their litigation costs will be shared since they will be all sued together. In short, both implementers and developers will pay fewer litigation costs, but they may still resort to tribunals to have the FRAND fee calculated.

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<sup>101</sup> Maskus and Merrill (n 11) 57.

<sup>102</sup> *ibid.*

In conclusion, the author submits that patent pools cannot end up with patent hold out. Implementers may keep challenging the FRAND nature of the pool's single license to have it reduced by tribunals. The author holds that it is necessary to give powers to the patent offices – such as the European Patent Office – to deal with FRAND calculation to decrease litigation, as developed in the fourth chapter.

## **5. The resistance of patent ambush**

Finally, as the pinnacle of the imperfectness of patent pools, it must be taken into account that participation is voluntary<sup>103</sup>. Consequently, the author states that patent pools cannot end up with patent ambush.

SSOs comprise the most important and active corporations for their industries. Consequently, the author considers that patent pools will alleviate the searching costs of implementers to a certain extent; they will help reduce the costs for identifying the majority of patents relevant to the standard<sup>104</sup>. However, implementers are not free from conducting an in-depth search to ensure that non-members will not claim royalties or an injunction.

Thus, the author thinks that patent pools do not solve the problem of patent ambush; outsiders may appear at any moment. Consequently, the author proposes two measures. First, the introduction of a compulsory licensing mechanism to bind outsider developers to offer FRAND licenses. Second, the amendment of the SSOs' IPR policies to ensure that the SEPs that their members do not disclose will have to be offered royalty-free.

On the whole, the author considers that patent pools complement the SSOs' IPR policies but do not solve all the existing market failures. By requiring essentiality checks to avoid antitrust liability and introducing aggregate royalty considerations, patent pools can solve two of the problems brought by the IPR policies. However, the expensiveness of essentiality checks may hamper the creation of some pools and limit the bundle of SEPs included in others. Furthermore, patent hold up, hold out and ambush remain unresolved.

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<sup>103</sup> Winghart, Holmes and Bailey (n 85) 92.

<sup>104</sup> Merges and Mattioli (n 83) 296; Régibeau, de Coninck and Zenger (n 3) 74.

In the following chapter, the author will develop a comprehensive proposal to solve all the market failures and end the IoT's patent wars.

## **IV. A comprehensive proposal to avoid the IoT wars**

Patent pools are not enough to avoid the IoT wars. To reduce the litigation over SEPs, the author proposes a three-pronged strategy. First, the SSOs' IPR policies have to be reformed. Second, the mechanism of patent pools has to be institutionalized within SSOs. Lastly, the patent offices, including the European Patent Office, must be equipped with compulsory licensing powers for the specific aim of ensuring interoperability. This way, litigation over SEPs will be reduced since most of the existing controversies will be solved at the SSO or the patent office level, and only the most complex claims will get to court.

### **1. The reformation of the IPR Policies of SSOs**

The first set of changes that the author considers necessary to overcome the market failures caused by the SSOs' IPR policies is the reform of the policies themselves. Currently, the basic premises to which any member of an SSO must agree are disclosing any patent essential to the standard and committing to license them in FRAND terms. Nevertheless, after some minor amendments, the SSOs' IPR policies would be more effective in preventing some of the market failures.

On the one hand, the author considers that the SSOs' IPR policies should have a distinct approach depending on the temporary disclosure of the SEP. Consequently, it is paramount to precisely define what essential means for the SSO and the term in which the disclosure of a patent will be considered temporary.

Regarding the first, among the possible definitions of essentiality, the author thinks that the most appropriate is that of commercial essentiality as explained in the second section, that is, including all patents that are necessary for the cost-effective commercialization of the standardized product, as opposed to only covering those that are indispensable for the functionality of the standard. In short, essential must mean essential to sell, not essential

to work. It is necessary to adopt this broad understanding of essentiality because the narrow definition could leave the standard unpracticable. If the implementers are forced to resort to expensive alternatives, they may not introduce the standard at all, an outcome that would harm the public interest in standardization.

Regarding the term for disclosure, the author reminds that standards are constantly evolving alongside technological advancement. Thus, it is necessary to distinguish between the patents granted before adopting the standard and those granted afterward. For the first, a temporary disclosure would be in one year after the patent holder is aware of the standardization initiative and always before the standard has been issued. For the patents granted after adopting the standard, temporary would equally mean one year after grant and always before initiating any judicial proceeding. In the author's opinion, one year is enough time to disclose, considering that blanket disclosures are available.

Knowing what essential and temporary mean, the author states that the SEPs which are temporarily disclosed will be subject to FRAND licensing terms. Furthermore, the author submits that the SSOs should require patent holders to commit to an *ex ante* price cap, that is, to make public the maximum royalties that they are going to demand before the standard is developed<sup>105</sup>. To make it simpler, the author suggests that the royalty cap could apply to the entire portfolio of SEPs of the disclosing member so that blanket disclosures are still possible and there is no need to individualize the price<sup>106</sup>. This way, the problem of patent hold up would be solved since the notion of FRAND would be filled with meaning *ex ante*. However, it is necessary to assess whether this solution is acceptable both in theory and in practice.

On the one hand, as to its theoretical acceptance, many scholars have warned that this technique could amount to price-fixing and thus be deemed anti-competitive because it could lead to collusion among the licensors to set the same price or among the licensees to pressure for lower fees<sup>107</sup>. Nevertheless, the author holds that it could be deemed pro-

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<sup>105</sup> Geradin, Layne-Farrar and Padilla (n 13) 136-137.

<sup>106</sup> Régibeau, de Coninck and Zenger (n 3) 28.

<sup>107</sup> Geradin, Layne-Farrar and Padilla (n 13) 137; Maskus and Merrill (n 11) 59-60; Paul H Saint-Antoine and Garrett D Trego, 'Solutions to patent hold-up beyond FRAND: An SOS to SSOs' (2014) 59(2) The Antitrust Bulletin 183, 209-210.

competitive<sup>108</sup>. In the first place, price-fixing does not occur; the decisions regarding the price will be taken at a later stage by the companies and not by the SSOs<sup>109</sup>. Moreover, it enhances the effectiveness of the FRAND commitments to ensure that hold up situations do not occur<sup>110</sup>. It would help ensure that SEP holders do not take advantage of their dominant position in the market, which is a pro-competitive effect by definition<sup>111</sup>. Furthermore, it allows the technicians working in the SSOs to assess the commercial viability of the solution, not only its technological advantages, which is paramount for the success of the standard<sup>112</sup>. It lets them choose the most cost-effective option to ensure that the standard is practicable. Thus, in theory, the author considers that price caps are a good complement for FRAND licensing terms.

On the other hand, as to its practical acceptance, it is necessary to attend to how the antitrust laws of the EU and the US have assessed them. In the EU, the Guidelines on the applicability of Article 101 of the TFEU to horizontal co-operation agreements in its paragraph 299 clearly states that “should a standard-setting organisation’s IPR policy choose to provide for IPR holders to individually disclose their most restrictive licensing terms, including the maximum royalty rates they would charge, prior to the adoption of the standard, this will normally not lead to a restriction of competition within the meaning of Article 101(1)”<sup>113</sup>. In the same line, the US Department of Justice has issued a business letter allowing two SSOs, IEEE-SA and VITA, to promote the establishment of *ex ante* price caps<sup>114</sup>. Thus, the authorities in the EU and the US have agreed with the author’s stance that *ex ante* price caps can be pro-competitive.

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<sup>108</sup> Geradin, Layne-Farrar and Padilla (n 13) 136-137.

<sup>109</sup> *ibid.*

<sup>110</sup> Régibeau, de Coninck and Zenger (n 3) 29; Saint-Antoine and Trego (n 107) 209-210.

<sup>111</sup> Maayan Perel, ‘An Ex Ante Theory of Patent Valuation: Transforming Patent Quality into Patent Value’ (2014) 14 J High Tech L 148, 149; Robert A Skitol, ‘Concerted Buying Power: Its Potential for Addressing the Patent Holdup Problem in Standard Setting’ (2005) 72(2) Antitrust Law Journal 727, 729.

<sup>112</sup> Régibeau, de Coninck and Zenger (n 3) 28-29.

<sup>113</sup> *Guidelines on the application of Article 101.*

<sup>114</sup> Anne Layne-Farrar, A Jorge Padilla and Richard Schmalensee, ‘Pricing Patents for Licensing in Standard-Setting Organizations: Making Sense of FRAND Commitments’ (2007) 74(3) Antitrust Law Journal 671, 679; Bharadwaj, Devaiah and Gupta (n 12) 157-158; Letter from Thomas O Barnett, Assistant Attorney General of the US Department of Justice Antitrust Division, to Michael A Lindsay, Institute of Electrical and Electronics Engineers (30 April 2007) available at <https://www.justice.gov/atr/response-institute-electrical-and-electronics-engineers-incs-request-business-review-letter>.

In addition, the author states that SSOs should require companies to adopt a royalty-free policy regarding the SEPs that are not disclosed temporarily. Establishing that SSO members will not charge for the patents they have not disclosed within the proscribed term would prevent patent ambush by insiders. Although non-members will still be able to charge non-FRAND fees since the organization's by-laws do not bind them, the author submits that the broad memberships of the SSOs will ensure that most companies cannot resort to ambush strategies.

In sum, the author considers that the SSOs' IPR policies would be strengthened through the requirement of price caps for the temporarily disclosed SEPs, alongside the currently existing necessity to commit to FRAND terms, and the limitation that all undisclosed patents will have to be offered royalty-free. These amendments will help combat hold up and ambush strategies. Nevertheless, the rest of the market failures will have to be addressed through other solutions, as the author outlines below.

## **2. The institutionalization of patent pools within SSOs**

The complementarity between patent pools and SSOs has been explored in the previous section. Although patent pools cannot solve all the market failures generated by the SSOs' IPR policies, the author has concluded that they are helpful to address royalty stacking. Moreover, she has stated that the requirement that essentiality checks must be performed the pool not to be anti-competitive can solve the challenge of over-declaration. However, to be practicable, she reminds that they must be affordable in the first place. For so, SSOs ought to introduce in-house pooling capacities.

SSOs develop thousands of standards every year. The author acknowledges that carrying out essentiality checks for each of them is not affordable either for SEP holders or SSOs. Thus, generalizing the requirement of essentiality checks would risk the standardization trend as a whole. Since SSOs lack the necessary budget to finance every pooling effort<sup>115</sup>, the author submits that SEPs holders should be in charge of initiating the pooling process and paying for the expenses. This way, market selection will occur, and it will not be necessary to perform essentiality checks for all the standards developed by SSOs, only

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<sup>115</sup> Akins (n 1) 591.



for those for which there is industry interest and their potential widespread implementation requires SEP holders to collaborate. After SEP holders have initiated the process, the author thinks that SSOs ought to collaborate by facilitating the essentiality checks through the commitment of their human capital. Since their technicians were in charge of developing the standard, they have the best knowledge about which patents will be essential to it. By assigning the task to them, the length of the essentiality checking process will be reduced<sup>116</sup>. Furthermore, they are employees of the SSO, not just external contractors, so the costs will be lower.

In summary, the author considers that the SSO that developed the standard should be in charge of the necessary essentiality checks if the technology achieves the pooling stage. If SSOs are ready to collaborate in such a manner and share the expenses of the pooling process with the SEP holders, the problems of royalty stacking and over-declaration will be contained.

### **3. The amendment of patent laws**

The reformation of the SSOs' IPR policies to include price caps alongside FRAND for disclosed patents and royalty-free licenses for undisclosed ones would help address the issue of hold up and ambush from insiders. Furthermore, the introduction of pooling capacities to SSOs would address royalty stacking and over-declaration. Nevertheless, there remain open challenges that cannot be solved by changing the operation of SSOs. Precisely, SSOs do not have the power to end up with hold out strategies by implementers and patent ambush strategies by outsider developers. To overcome these challenges, the author submits that it is necessary to undertake an overhaul of the patent law regime in the EU and the US to introduce two major changes. First, it is necessary to introduce or amplify the compulsory licensing mechanism to include a specific ground for interoperability standards. Second, patent laws must demand implementers to resort to the compulsory licensing mechanism before they challenge the non-FRAND nature of the fees in court.

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<sup>116</sup> *ibid.*

### **3.1. Introduction of a compulsory licensing mechanism for interoperability standards**

Patents are monopoly rights granted in exchange for making public an invention. The general rule is that the patent holder is the only actor who can use the invention for a fixed period; however, the monopoly is not absolute. One of the most important exceptions is compulsory licensing, a regulatory measure by which the government, for the sake of the general interest, imposes determined licensing terms on an unwilling patent holder<sup>117</sup>. Given that granting a too strong monopoly may lead to undesired anti-competitive effects, the states have reserved the faculty to limit the granted powers in certain circumstances. The author argues that the need to ensure interoperability ought to be one of the grounds for compulsory licenses. Compulsory licensing can complement patent pools by serving as a mechanism to prevent patent ambush by non-SSO members. To achieve such an aim, the author submits that it is necessary to amend the national patent laws to introduce interoperability as a ground to grant a compulsory license. The author will analyze the viability of such an amendment by paying attention to how compulsory licensing has been regulated by International Law, what is the current stance of the EU and the US, and which kind of amendments could be made to their legislations to enable the compulsory licensing of SEPs.

#### **3.1.1. International Law**

The first international treaty to regulate compulsory licensing at a global level was the Paris Convention for the Protection of Industrial Property<sup>118</sup>. Article 5(2) allows the members of the Union to introduce this mechanism to their national laws to prevent the abuse of the monopoly granted by patent laws. Precisely, this convention is interested in failure to work, but it does not limit the grounds for which a compulsory license could be granted. Thus, the author holds that it would be possible to introduce interoperability as a basis for the grant. Furthermore, the limitations on the scope of the license introduced by the Paris Convention are restricted to the case of failure to work or insufficient working.

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<sup>117</sup> Srividhya Ragavan and Raj S Davé, 'A Comparison of FRAND and Compulsory Forms of Licenses' (2015) April *The Licensing Journal* 10, 12-13.

<sup>118</sup> Paris Convention for the Protection of Industrial Property (adopted 20 March 1883, entered into force 7 July 1884) 828 UNTS 305 (Paris Convention) art 5.

Thus, the author considers that it does not limit the potential compulsory license over interoperability standards.

On the other hand, Article 31 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) establishes the conditions under which states can introduce a compulsory licensing mechanism to their national legislation<sup>119</sup>. Without even using the notion of compulsory licensing, the treaty establishes a long list of conditions to be fulfilled. The most important ones are the requirement of unsuccessful efforts to get the authorization from the patent holder on “reasonable commercial terms” in a reasonable time; the limitations as to the duration, which shall be fixed, and the market, which must be the national one; and the guarantee that the established remuneration fees shall be subject to review by the national tribunals. These conditions do not confine the grounds under which a compulsory license can be taken, but they limit the scope of the rights to be granted to the implementers so that the monopoly granted by the patent is not entirely eradicated. In this sense, the author considers that TRIPS would allow introducing interoperability as a ground for compulsory licensing, as long as the grant of the licenses is subject to the conditions referred above.

In conclusion, the author’s review shows that the international regulation of compulsory licensing is open as to the grounds under which compulsory licenses can be granted. Thus, interoperability may be introduced as a ground for the grant of a compulsory license. However, TRIPS sets forward some conditions that cannot be avoided. The national laws developing the regulation of compulsory licensing in each country should pay attention to them. The author will explain how the EU and the US have regulated the matter in the following section.

### **3.1.2. European Union**

In the EU, compulsory licenses for European patents with unitary effect and national patents are governed by national laws<sup>120</sup>. As an example, it is interesting to see how

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<sup>119</sup> Agreement on Trade-Related Aspects of Intellectual Property, Annex 1C to the Agreement establishing the World Trade Organization (adopted 15 April 1994, entered into force 1 January 1995) 1869 UNS 299 (TRIPS) art 31.

<sup>120</sup> Regulation (EU) 1257/2012 implementing enhanced cooperation in the area of the creation of unitary patent protection [2012] OJ L361/1, recital 10.

France and Spain have regulated the matter. In France, the grounds to apply for a compulsory license are the lack or insufficient exploitation by the patent holder, dependency between patents, public health, national economy, and national defense<sup>121</sup>. Meanwhile, the Spanish Patent Law establishes five grounds: the lack or insufficiency of exploitation of the patented invention, the dependency between the patents, the need to put an end to anti-competitive behavior, the general interest in the grant, or the creation of pharmaceutical products to be sent to countries with a health crisis<sup>122</sup>. It is possible to see that lack or insufficient exploitation and dependency are common to both countries and can also be found in other states. I consider these grounds attractive since they can be helpful regarding the compulsory licensing of interoperability standards. However, I hold that the relevance of standards for social welfare justifies the introduction of a specific ground for interoperability. The public interest at stake is the need to make our devices compatible with each other. In the same manner that the essentiality of pharmaceuticals has proven them worthy of their specific ground for compulsory licensing, the need to encourage standardization has brought this proposal to the forefront. In the author's view, introducing compulsory licensing for interoperability standards could eradicate patent ambush from non-members to the SSO. The mechanism ought to be articulated as follows.

First, to comply with TRIPS, the author deems it necessary to clarify that any implementer willing to use the patent must first try to get authorization from the SEP holder. In the case of non-members of the SSO, the problem is that the implementer has not negotiated directly with them since they were not part of the organization and thus are not part of the patent pool. However, it may have already accepted the latter's unitary license, a factor that should be considered. The author reminds us that TRIPS does not demand that the implementer has negotiated directly with the SEP holder in question; it just requires that "the proposed user has made efforts to obtain authorization from the right holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period of time"<sup>123</sup>. Since implementers have been in contact with SSOs, whose membership includes the most relevant actors in the field, and they have subscribed to the license offered by the patent pool, the author holds that it

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<sup>121</sup> Loi no 92-597 du 1er juillet 1992 relative au code de la propriété intellectuelle, art L613-12-L613-19.

<sup>122</sup> Ley 24/2015, de 24 de julio, de Patentes, art 91.

<sup>123</sup> TRIPS art 31.

cannot be concluded that they have not made efforts to obtain authorization; they have made efforts to reach all the SEP holders. Thus, the author considers that the requirement in TRIPS should be considered fulfilled.

Second, TRIPS also establishes limitations as to the scope of the compulsory license. In this sense, the author acknowledges that the national effect of the license and its limited duration are major challenges, which may make implementers reconsider the effectiveness of the measure. To achieve the same as with the pool, they would have to apply for a compulsory license in every country where the technology is patented and renew it every time it expires. This process is lengthy and expensive since it requires legal assistance in each market of interest. However, it is not entirely useless since it will act as a driver for the outsider to join the pool and benefit from a more straightforward licensing process. If the reason why the outsider developer remains out of the pool is the possibility that it will get higher remuneration in non-FRAND terms, the author thinks that the existence of a compulsory licensing mechanism will put an end to such an incentive. Although TRIPS uses the notion of “adequate remuneration” rather than FRAND, they are very similar in practice. Consequently, outsider developers will not resort to patent ambush practices to get higher remunerations. For the sake of avoiding these market failures, the author deems it necessary to include interoperability as a ground for compulsory licensing.

In conclusion, the author considers that interoperability must become a ground for granting a compulsory license. Furthermore, the subscription to the license offered by the pool host by the creator SSO ought to be enough to consider the requirements in TRIPS fulfilled. As to the limits, the effect of the compulsory license will apply to the national territory and a fixed period. Furthermore, "adequate" retribution must be given in return for the license. In this sense, national laws should define the term "adequate" as FRAND, including aggregate royalty considerations. The regulation of the compulsory licensing could be as follows:

*‘At any time, any person with the ability to work the invention to the public advantage may apply for a compulsory license on one of the following grounds:*

*(a) Need to ensure interoperability among devices by the implementation of common standards. [...]*

*Before applying for a compulsory license, the interested party must prove that he has made reasonable efforts to obtain authorization to use from the patent holder without succeeding in a reasonable period. In relation to licenses under (a), participation in the SSO responsible for creating the interoperability standard at stake and in the patent pool created to facilitate its implementation will amount to reasonable efforts.*

*The patent office will determine an adequate remuneration according to the nature of the invention. To this effect, adequate is understood as fair, reasonable and non-discriminatory, and it must take into account the resulting aggregate royalty fee’.*

### **3.1.3. United States**

In the US, the legal landscape is very different. There is no general compulsory licensing exception that can be resorted to by companies. There is only a limited exception in 28 US Code, Section 1498, allowing the government to use patented technologies subject to adequate remuneration. It extends to companies working for the government and with its authorization. However, it is not as broad as in France or Spain, where companies can apply with independence to any governmental activity. In the author’s opinion, this major challenge poses the US in a more difficult situation to solve patent ambush from outsiders. To solve this market failure, it is not only necessary to expand the notion of compulsory licensing to include a specific ground for interoperability standards, but it is also necessary to build a compulsory licensing system anew. However, the author considers that introducing a general compulsory licensing is unlikely; rather, further research can be made as to whether it would be more viable to introduce a restricted mechanism limited to the licensing of interoperability standards. As a precedent, it is worth mentioning the Clean Air Act, where a compulsory licensing mechanism was established for certain technologies funded through US government grants, or the Energy Storage Competitiveness Act, where this tool was enabled for key technologies for the US competitiveness in the global energy storage market<sup>124</sup>. Thus, while introducing a general compulsory licensing mechanism for the US is not expected, the author thinks an Interoperability Act setting a compulsory licensing mechanism for SEPs could be achieved. The author advises further research in this direction.

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<sup>124</sup> Ragavan, Murphy and Dave (n 74) 111.

In conclusion, to solve the problem of patent ambush by outsiders, the author considers that it is necessary to enable the mechanism of compulsory licensing regarding standards, either by setting interoperability as one of the grounds for the grant of a compulsory license – in the EU – or, in the absence of a general compulsory licensing mechanism, by issuing a subject-specific law introducing compulsory licensing solely for interoperability standards – in the US. This way, whenever implementers consider that the license for a SEP is not adequate or compliant with FRAND, they will be able to resort to the patent authorities for assistance. Even though their decisions will remain subject to national courts, the author submits that this previous step can reduce litigation over SEPs.

### **3.2. Compulsory licensing as a prerequisite for FRAND litigation over SEPs**

In the previous section, the compulsory licensing mechanism has been proposed to solve patent ambush by developers. Nevertheless, this mechanism should not only benefit implementers; rather, it should be a balanced mechanism helping to reduce hold out practices by the latter. To do so, the author deems it necessary to make the compulsory licensing mechanism a prerequisite to initiating litigation over the FRAND nature of the charged fees.

In the context of the EU, *Huawei v. ZTE* has been criticized because it strengthens the hold out strategies by establishing a burdensome process for developers to obtain an injunction. Consequently, to restore the balance, the author holds that it is necessary to require implementers to first utilize the compulsory licensing mechanism before resorting to tribunals.

On the other hand, the US is better positioned regarding the hold out challenge because of *Ericsson v. D-Link*. The implementer is in a more burdensome position than in the EU to benefit from litigation. Nonetheless, since this proposal aims to reduce litigation over SEPs, the author submits that giving power to the patent office to decide the FRAND fares would reduce the number of cases that get to tribunals and avoid the potential patent war over the IoT. Consequently, the author considers that compulsory licensing should be a prerequisite to litigate both in the EU and in the US.

In short, the author submits that the reformation of the IPR policies of the SSOs, the institutionalization of patent pools within them, and the introduction of compulsory licensing capacities for interoperability standards to national patent offices will solve the five market failures at stake. It will, thus, reduce litigation over SEPs. Even though some cases will still reach the tribunals, the author expects that most cases will be solved at a prior stage by the SSOs and the patent offices, such as the European Patent Office.

## V. Conclusion

In view of the smartphone wars, the author has submitted this legal opinion to the European Patent Office, aimed at avoiding the IoT wars by offering a proposal to reduce litigation over SEPs.

Firstly, the author has identified the most important market failures leading to litigation over SEPs and their roots in the deficiencies of the SSOs' IPR policies. In the author's view, the challenge *par excellence* is patent hold up, which can be defined as the demand of royalties that exceed a FRAND rate. She considers that the driver of this problem is the lack of definition of FRAND by the SSOs. Furthermore, she submits that the absence of precision in FRAND has pushed a second failure, patent hold out or reverse hold up, which is the strategy by which implementers argue that the royalty fee is not FRAND to avoid paying until forced by a court. In the same line, the author believes that the lack of aggregate fees considerations in FRAND has led to royalty stacking, to the accumulation of fees to the extent that the standard is too expensive to be implemented. The fourth market failure identified by the author is patent ambush, which can be defined as not disclosing a SEP to the SSO to charge non-FRAND fees. This phenomenon is caused by the deficient specifications of which patents should be disclosed. Finally, the author has introduced the most widespread challenge, over-declaration, which is the framing as SEPs of patents that are not genuinely essential. This problem is linked to the lack of essentiality checks by the SSOs. To sum up, in the author's opinion, these market failures caused by the deficient SSOs' IPR policies have resulted in increasing litigation among developers and implementers.



Secondly, the author has analyzed the viability of the proposal by the EU and the US of using patent pools as a mechanism to reduce litigation over SEPs. However, she has concluded that patent pools are an imperfect solution; they can help alleviate some of the problems, but they cannot end up with all the challenges. Precisely, she states that they can help solve royalty stacking and over-declaration, but they are not a useful tool to remediate the additional issues. Furthermore, the author points out that patent pools are an expensive mechanism and additional funding must be found to ensure their viability.

Consequently, the author has presented a comprehensive proposal capable of putting an end to all the challenges mentioned above, even the ones that are not solved by patent pools. First, the author believes that it is necessary to reform the SSOs' IPR policies. She considers that the notions of essentiality and temporary disclosure must be defined thoroughly. This way, it will be possible to require FRAND licensing for those SEPs that are temporarily disclosed. Furthermore, she introduced *ex ante* price caps to solve the problem of patent hold up. Meanwhile, she points out that those SEPs that are not temporarily disclosed will have to be offered royalty-free so that a patent ambush is no longer an option for SSO members. Second, to make patent pools cost-effective, the author proposes the institutionalization of the mechanism within SSOs. This way, the problems of royalty stacking and over-declaration would be solved. Nevertheless, to fix all the failures, the author submits that it is necessary to back the efforts of SSOs through legislative amendments that give an enhanced role to the patent offices, such as the European Patent Office. The author states that a compulsory licensing mechanism is necessary, but it must be erected to be useful both to implementers and developers; to solve not only patent ambush by non-SSO members but also patent hold out by implementers. Thus, in the author's opinion, courts must require implementers to use this mechanism before they bring any proceeding.

In conclusion, the author submits that the implementation of this proposal will bring a reduction of the litigation over SEPs. Implementers and developers will be compelled to solve their disagreements within the SSO or the patent office. Consequently, only a residual quantity of cases will reach court, the most complex, for which the two other organisms have not found a satisfactory solution. There will still be some battles over the IoT, but it will not be possible to speak about an open war over standards.

## VI. ANNEX I

### 1. Table of Cases

#### 1.1. European Union Cases

Case C-170/13, *Huawei Technologies Co Ltd v. ZTE Corp, ZTE Deutschland GmbH* [2015] OJ C302/2.

*Koninklijke Philips N.V. v. Asustek Computers INC*, District Court of the Hague, 2017, Case No. C 09 512839 /HA ZA 16-712.

*Unwired Planet International Ltd v. Huawei Technologies Co Ltd* [2017] EWHC 711 (Pat).

*Rambus* (Case COMP/38.636) Commission Decision 2010/C 30/09 [2010] OJ C30/17.

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*Apple, Inc. v. Motorola, Inc.*, 869 F. Supp. 2d 901 (N.D. Ill. 2012).

*CSIRO v. CISCO Systems, Inc.*, 809 F.3d 1295 (Fed. Cir. 2015).

*eBay, Inc. v. MercExchange, LLC*, 547 US 388 (2006).

*Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201.

*Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F Supp 1116 (SDNY 1970).

Letter from Thomas O Barnett, Assistant Attorney General of the US Department of Justice Antitrust Division, to Michael A Lindsay, Institute of Electrical and Electronics Engineers (30 April 2007) available at <https://www.justice.gov/atr/response-institute-electrical-and-electronics-engineers-incs-request-business-review-letter>.

*Microsoft Corp. v. Motorola, Inc.*, 696 F 3d 872 (9th Cir 2012).

*Microsoft Corp. v. Motorola, Inc.*, (W.D. Wash. Apr. 25, 2013).

*Rambus Inc. v. FTC*, 522 F.3d 456 (2008).

*Standard Sanitary Mfg. Co. v. United States*, 226 U.S. 20 (1912).

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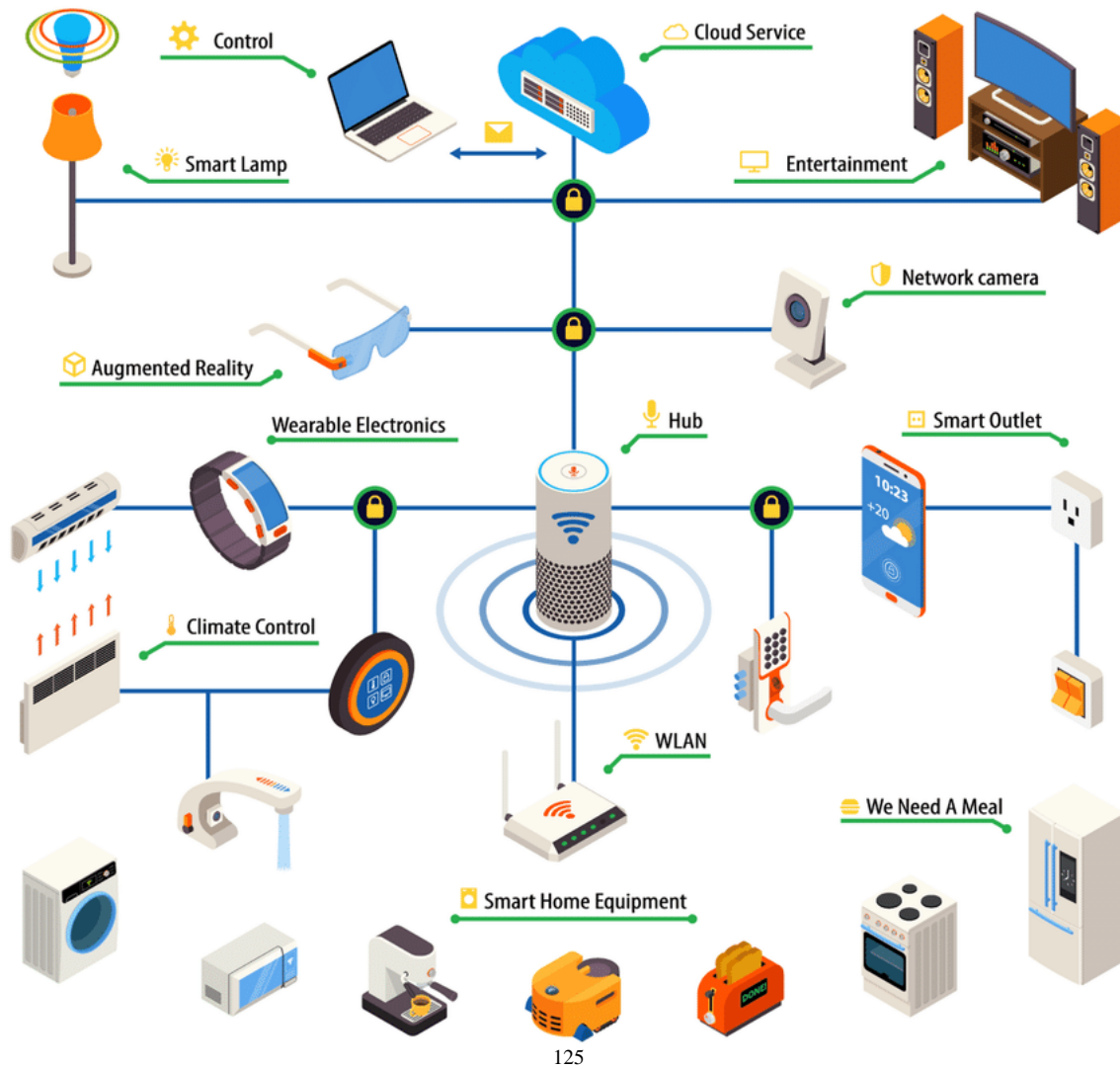
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## VII. ANNEX II

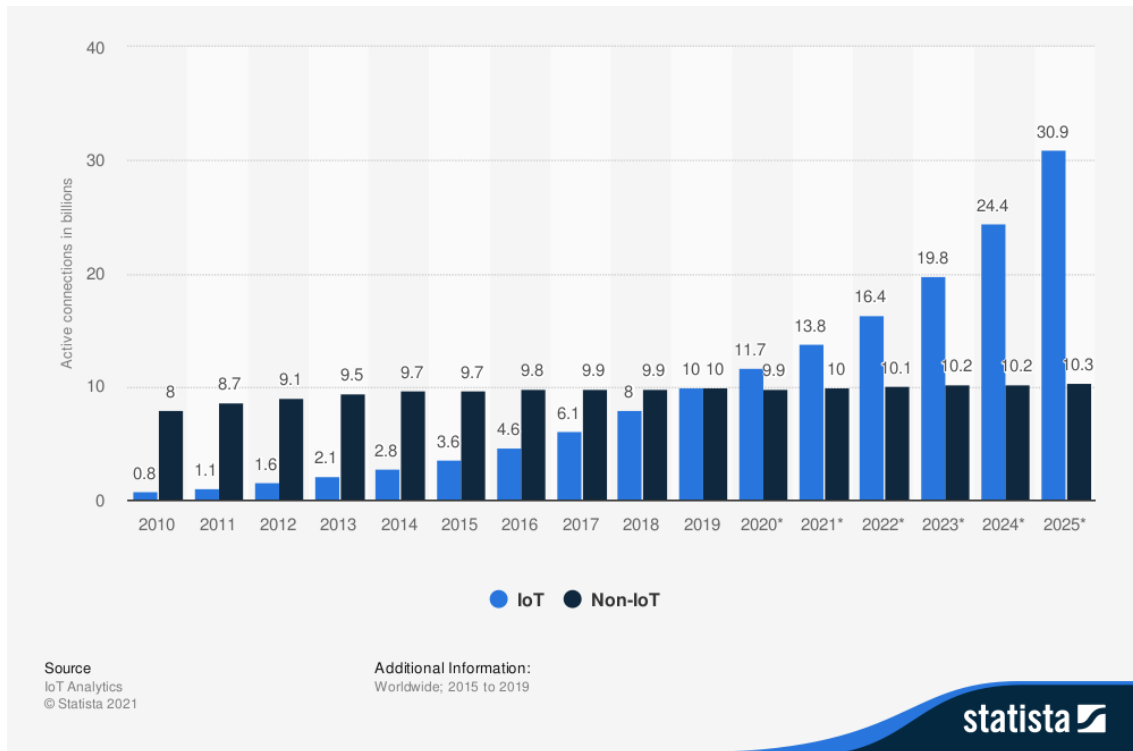
### Graphical representation of modern IoT advancements and usage purposes



<sup>125</sup> Mohib Ullah Khan and others, 'A novel category detection of social media reviews in the restaurant industry' (2020) October Multimedia Systems <[https://www.researchgate.net/figure/Graphical-representation-of-modern-IoT-advancements-and-usage-purposes\\_fig1\\_344862872](https://www.researchgate.net/figure/Graphical-representation-of-modern-IoT-advancements-and-usage-purposes_fig1_344862872)> accessed 24 August 2021.

## VIII. ANNEX III

### Internet of Things (IoT) and non-IoT active device connections worldwide from 2010 to 2025 (in billions)

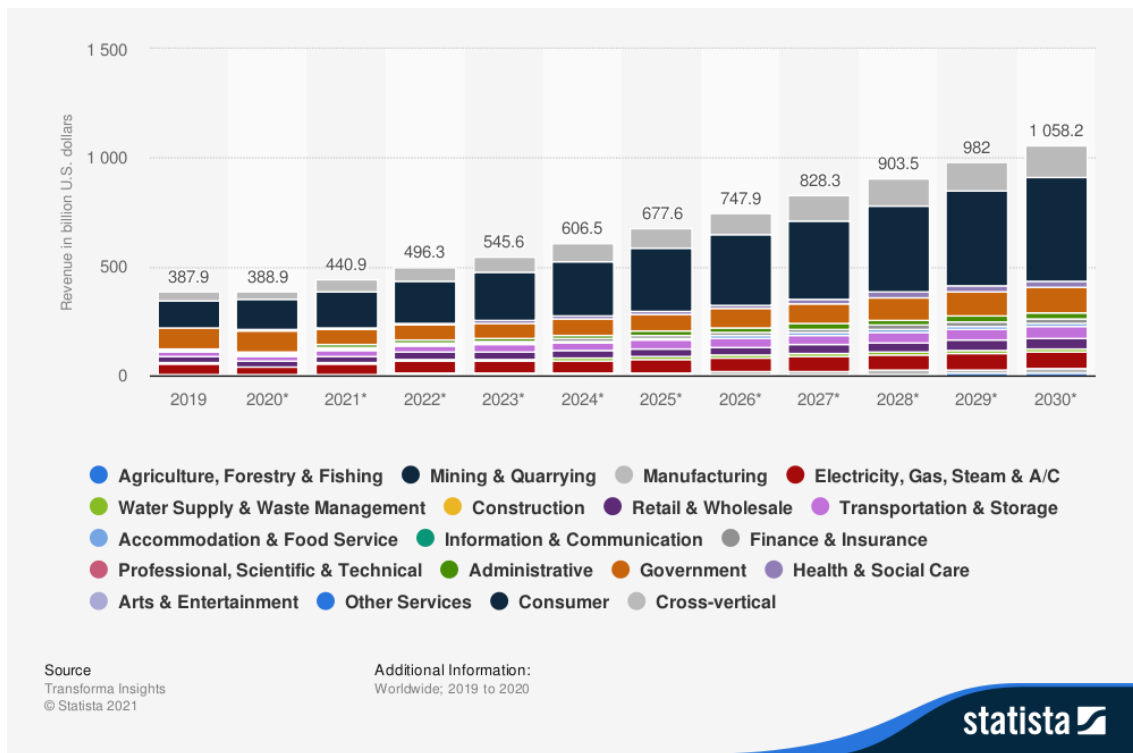


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<sup>126</sup> IoT Analytics, 'Internet of Things (IoT) and non-IoT active device connections worldwide from 2010 to 2025 (in billions)' (Statista 2021) 1.

## IX. ANNEX IV

### Internet of Things (IoT) revenue worldwide from 2019 to 2030 (in billion U.S. dollars), by vertical

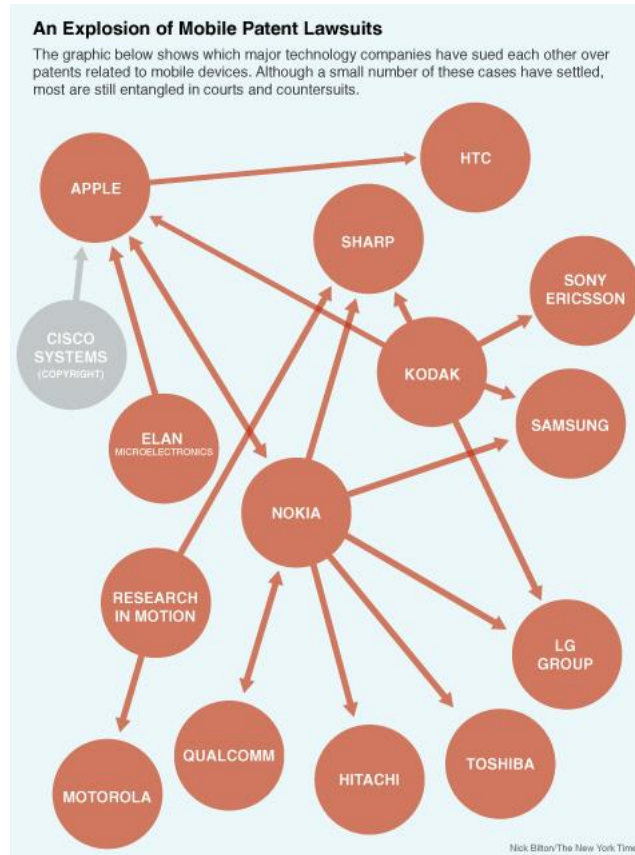


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<sup>127</sup> Transforma Insights, 'Internet of Things (IoT) revenue worldwide from 2019 to 2030 (in billion U.S. dollars), by vertical' (Statista 2021) 1.

## X. ANNEX V

### Illustration of the smartphone patent thicket through the lawsuits among the major technology companies



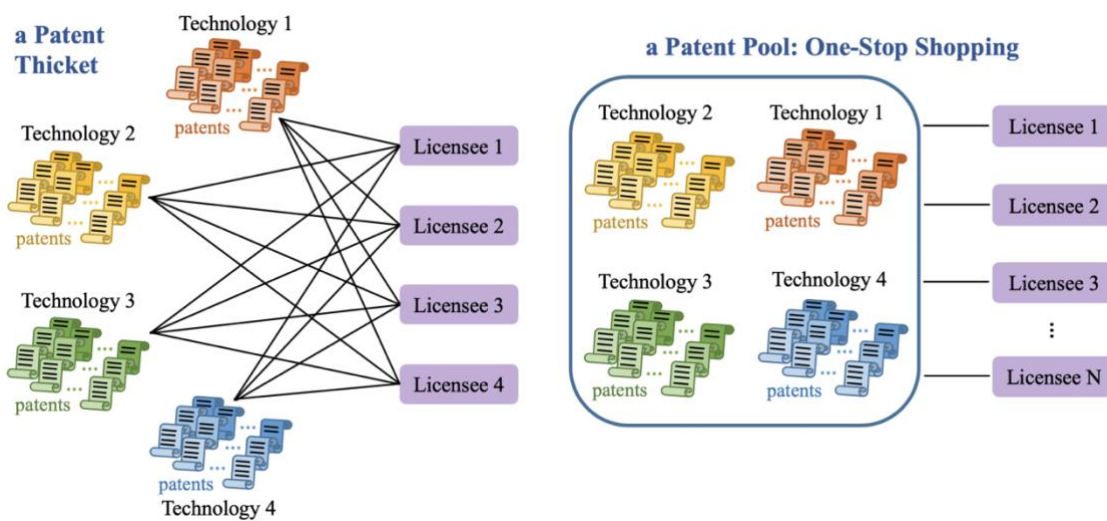
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## XI. ANNEX VI

### Illustration of the different licensing scenario under a patent thicket and a patent pool



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<sup>129</sup> Lucy Xiaolu Wang, 'Global Drug Diffusion and Innovation with the Medicines Patent Pool' (2021) SSRN <<https://ssrn.com/abstract=3426554>> accessed 24 August 2021.