ARE PAES DIFFERENT? THE LEGAL TREATMENT OF PATENT ASSERTION ENTITIES IN EUROPE AND THE UNITED STATES

Jorge L. Contreras and Peter Georg Picht

ABSTRACT

Patent assertion entities are playing an increasing role in patent litigation, in both the United States and Europe. Analyzing the resulting case law, mainly in the SEP/FRAND context, this article shows similarities as well as differences in the approaches taken by U.S. and EU courts. These distinctions can assist policy makers as they consider various proposals for patent law amendments in their jurisdictions.

Introduction

It is impossible to discuss patent litigation today without mentioning the phenomenon of patent assertion entities (PAEs). PAEs are entities that do not actively manufacture or sell patented products or services, but rather acquire patents from a variety of sources and then seek to collect patent licensing fees from companies manufacturing, selling, or using covered products. PAEs are sometimes referred to by the pejorative term patent "trolls." PAEs typically obtain patents from third parties: failed startups, bankrupt estates, companies abandoning all or part of their business activity, individual inventors, or operating companies that wish to earn revenue from underutilized patent assets. In some cases, operating companies may retain an interest in patents transferred to PAEs in an arrangement that has been referred to by critics as "privateering." One recent study found that approximately 80 percent of patents asserted by PAEs were obtained from operating

One source reports that in 2016, approximately 69 percent of the patent cases filed in the United States were filed by PAEs [1]. While there is some disagreement regarding the precise number, size, and impact of PAE lawsuits, most studies suggest that a significant portion of recent U.S. patent litigation is attributable to PAEs [3]. PAE activity is significant in Europe as well [2].

PAE litigation has been characterized by some commentators and policy makers as a distinct phenomenon, differing in some ways from ordinary patent litigation among operating companies. On one hand, critics fear that PAE litigation clogs the judicial system, drains resources from research, innovation, and product development, harms small businesses, and increases the cost of products and services across industries. Defenders

of PAEs counter that these entities are operating within their legal rights by asserting patents duly issued by governmental agencies, and that their ability to monetize underutilized patents provides needed liquidity to the market and helps innovators who are unable to compete directly with large enterprises.

In this article, we do not attempt to solve the intractable policy questions surrounding the PAE phenomenon. Instead, we ask whether the law that has evolved concerning PAEs, at least in the United States and Europe, is *different* than the law governing patent litigation more generally. We focus in part on litigation concerning patents that are essential to industry standards such as IEEE's 802.11 Wi-Fi standards. Standards-related litigation has become increasingly prominent, and there is evidence that substantial numbers of standards-related patent lawsuits have been initiated by PAEs in both Europe and the United States [4, 5]. Likewise, several of the legal adjustments made by courts with respect to PAEs have arisen in this area.

PAEs and the Law in the United States

Overview

There has been a keen awareness of PAE litigation within all branches of government in the United States. As early as 2006, Justice Kennedy, writing for four justices of the Supreme Court in eBay v MercExchange, expressed concern with PAE suits, observing that in recent years "[a]n industry has developed in which firms use patents not as a basis for producing or selling goods but, instead, primarily for obtaining licensing fees" (p. 396). In 2013, the Obama administration issued a report drawing attention to the proliferation of PAE litigation and calling on both executive agencies and Congress to effect legal changes to address what was perceived as abusive litigation tactics in this context. Although neither of these calls to action has yet resulted in signficant legislative or regulatory change, courts continue to be wary of PAE suits in the United States, as discussed below.

Injunctions

Prior to the U.S. Supreme Court's landmark decision in *eBay v MercExchange* (2006), the holder of a valid U.S. patent was more or less assured

¹ The term non-practicing

entity (NPE) is a broader

Digital Object Identifier: 10.1109/MCOMSTD.2018.1700045

Jorge Contreras is with the University of Utah; Peter Georg Picht is with University of Zurich and the Max Planck Institute for Innovation and Competition.

description that is sometimes used in this context, although NPEs, which are entities that do not manufacture or sell products covered by their patents, include universities and government R&D labs. PAEs are generally considered a subset of NPEs.

of obtaining an injunction to prevent an infringer from producing or selling infringing products. In *eBay*, the Supreme Court altered this longstanding rule by requiring courts in patent cases to refer to historical grounds for the issuance of "equitable" relief. This requirement resulted in the introduction of a four-factor test for issuing injunctions in patent cases. After *eBay*, an injunction will not be issued unless a patent holder can demonstrate:

- That it has suffered an irreparable injury from the infringement
- 2. That remedies available through law (i.e., monetary damages) are inadequate to compensate it for that injury
- That balance of hardships between the patent holder and the infringer weigh in favor of granting the injunction
- 4. That the public interest would not be disserved by the award of an injunction

In a separate concurring opinion, four justices explained their support for the new injunction standard in view of the fact that PAEs could use injunctive relief as "a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent" (p. 396). Accordingly, these justices urge lower courts to view requests for injunctive relief by PAEs with a degree of skepticism.

The principal difficulty that PAEs face today in seeking injunctive relief under *eBay* is factor 2: the patent holder must show that its injury cannot adequately be compensated through an award of monetary damages. Because PAEs have no business *other* than asserting patents for financial gain, it has been argued that, by definition, they are fully compensated by monetary damages, making the issuance of an injunction unnecessary [3, 9]. Under this theory, permitting PAEs to seek injunctive relief would give them additional and inappropriate leverage to seek higher royalties in licensing negotiations.

As a result, after *eBay* the ability of PAEs to obtain injunctive relief in the United States was significantly curtailed. One recent study found that while permanent injunctions were issued in approximately 75 percent of U.S. patent cases, PAEs were successful in obtaining injunctions only 16 percent of the time [6].

Interestingly, this result does not hold with respect to exclusion orders issued by the U.S. International Trade Commission (ITC). As an administrative agency, the ITC is authorized to prohibit the importation of goods that infringe on U.S. intellectual property rights. Such an exclusion order will only be issued if the asserted patent rights affect a domestic industry. However, the relevant statute provides that "licensing" activity is sufficient to constitute a domestic U.S. industry, and as a result ITC exclusion orders have routinely been issued in favor of patents held by PAEs. This being said, the ITC is also required to consider the impact of any exclusion order on the public interest in the United States. In 2013, the Obama administration, acting through the U.S. Trade Representative, disapproved (and effectively required the ITC to reverse) an exclusion order issued against certain Apple products manufactured abroad, explaining that the importation of standardized products into the United States can

have significant beneficial effects for U.S. commerce and industry.

DAMAGES

Lost Profits: Under the U.S. Patent Act, a patentee that proves infringement is entitled to recover damages amounting to "no event less than a reasonable royalty." In addition to such reasonable royalty damages, patent holders may also seek damages based on the profits that they have lost as a result of the infringement. As explained by the U.S. Court of Appeals for the Federal Circuit in *Rite-Hite v. Kelley* (1995), "[n] ormally, if the patentee is not selling a product, by definition there can be no lost profits." And because PAEs do not themselves sell products, courts have generally not awarded lost profits damages to PAEs [7].

Reasonable Royalties: Without lost profits, PAEs who prove that their patents are infringed on may only seek monetary damages based on a reasonable royalty. In the United States, reasonable royalty damages are intended to reflect the incremental value that a patented technology contributes to a product. Such damages are often calculated using an analytical framework in which the court or jury seeks to determine what royalty the parties would have agreed on in a hypothetical negotiation immediately prior to the time of infringement.

But while lost profits (the entire profit on a patented product) are often assumed to be higher than reasonable royalties (the royalty payable to a single patent holder whose patents cover the product), litigation data show that NPEs have consistently obtained median reasonable royalty damages awards substantially in excess of those obtained by practicing entities [3, 7]. For example, PriceWaterhouseCoopers reports that between 2011 and 2016, median damage awards in suits brought by NPEs were 3.8 times higher than awards in suits brought by practicing entities [7].²

There are several possible explanations for this discrepancy. First, PAEs, which do not need patents for their own technology or products, may select patents for enforcement based solely on their potential monetary value, rather than their strategic or market value to a product or business line. Likewise, PAEs may bring suit against a market participant based solely on its attractiveness as a financial target, without regard to strategic, supply chain, or customer relationships (i.e., a component vendor might be reluctant to sue its largest customer, notwithstanding that customer's infringement of the vendor's patents). Third, PAEs, which have no product markets to defend, are less susceptible to counterclaims and injunctive threats against their own products. And finally, PAEs, as repeat players, may simply be better at patent litigation than one-off participants in the litigation game. Thus, unlike typical manufacturing firms, PAEs (or their owners) may have a ready arsenal of litigators, claim charts, briefs, experts, and the like to reflect economies of scale as well as a dedicated litigation budget.

In view of these considerations, some scholars have suggested that U.S. patent damages law be recalibrated to reduce inappropriately high PAE recoveries. One such proposal would allow a pat-

In the U.S., reasonable royalty damages are intended to reflect the incremental value that a patented technology contributes to a product. Such damages are often calculated using an analytical framework in which the court or jury seeks to determine what royalty the parties would have agreed in a hypothetical negotiation immediately prior to the time of infringement.

² These statistics include awards to non-PAE NPEs such as research universities, which have been responsible for some of the largest recent patent awards.

Most PAEs obtain their patents from others: operating companies, research institutions. individual inventors, and the like. Ordinarily, when patents are transferred to a new owner, the new owner acquires those patents subject to any licenses that were previously granted. However, the survival of a patent owner's commitment to grant licenses following a transfer of patents is less clear.

entee to recover substantial monetary damages only when it has undertaken efforts to produce or market the patented invention [8]. If such an approach were adopted (something that would likely require Congressional action), it would have a significant impact on the incentives for PAEs to bring patent suits and, indeed, to remain in business at all.

Another, less drastic, proposal would revamp the reasonable royalty damages framework when "willing licensors" (patent holders that are willing to license infringers) sue infringers that did not intentionally copy the patented technology ("innocent" infringers) [9]. Under this revised framework, reasonable royalty damages would be based solely on information available to the parties in a hypothetical negotiation occurring when the infringer became committed to using the patented technology [id.]. This approach has already gained traction in cases involving standards-essential patents (damages should be based on the royalty rate that would have been agreed on by the parties before the patented technology was adopted in a standard), but could also be extended to patents outside the standards area.

PATENT TRANSFERS TO PAES

As noted above, most PAEs obtain their patents from others: operating companies, research institutions, individual inventors, and the like. Ordinarily, when patents are transferred to a new owner, the new owner acquires those patents subject to any licenses that were previously granted. However, the survival of a patent owner's commitment to grant licenses following a transfer of patents is less clear. Nonetheless, PAEs that have tried to disavow such promises, especially in the case of commitments to license standards-essential patents, have encountered resistance from both industry and antitrust agencies. The first notable case of this nature occurred in 2008, when a PAE known as Negotiated Data Solutions (N-Data) acquired patents covering IEEE's 802.3 Fast Ethernet standard. The original patentee, National Semiconductor, had committed to IEEE that it would license the patents to manufacturers at a flat rate of \$1000. After acquiring the patents, N-Data announced that it would seek higher rates. Following industry complaints, the U.S. Federal Trade Commission brought an action alleging that N-Data's disavowal of National's earlier \$1000 commitment (of which it was aware when it acquired the patent) constituted an unfair method of competition and an unfair act or practice under Section 5 of the U.S. FTC Act. N-Data agreed to settle the claims brought by the FTC.

Similar concerns were raised when newly formed Rockstar Bidco (a consortium including Apple, Blackberry, Ericsson, Microsoft, and Sony) sought to acquire a large portfolio of patents from then-bankrupt Nortel Networks without adhering to some of Nortel's prior licensing commitments to standards bodies. In order to secure the assets, Rockstar eventually agreed to honor those commitments.

In response to actions like these, a number of standards development organizations, such as IEEE, the International Standards Organization (ISO), and the International Telecommunication

Union (ITU), have revised their internal policies to require that transferors of patents subject to FRAND and other licensing commitments ensure that those patents continue to be subject to such commitments following transfer.

A different set of concerns has recently arisen in the context of "privateering," in which operating companies transfer patents to PAEs for assertion, usually while retaining some financial interest in the outcome of the litigation. Commentators have theorized that a range of antitrust claims could potentially be brought against operating companies and PAEs that conspire to raise rivals' costs through patent transfers such as these [11].

In one recent case Apple alleged that Nokia, the holder of a large patent portfolio covering wireless telecommunications standards, conspired with Acacia and other PAEs to divide Nokia's portfolio and assert its patents separately [10]. Apple claimed that this conduct was intended to "diffuse and abuse" Nokia's portfolio by forcing manufacturers to defend multiple suits and collecting "far more in royalties than [Nokia] could have sought on its own." Such privateering conduct was alleged to have violated both Nokia's commitments to the standards body (European Telecommunications Standards Institute, ETSI) and U.S. antitrust law [id.]. This case appears to have been settled without adjudication of these issues.

PAES AND THE LAW IN EUROPE

OVERALL TREATMENT BY COURTS

As in the United States, PAEs have been involved in significant patent litigation in Europe [2], including significant litigation involving SEPs. Accordingly, a number of European commentators have proposed restrictions on PAE litigation activity. Courts, however, have not generally been hostile toward PAEs. On the contrary, courts in Europe seem hesitant to impose patent law or competition law consequences based solely on the fact that a party is a PAE. German courts, for instance, have stated explicitly that they see no reason to treat PAEs differently from other patent owners [12]. Hence, for the time being, the general rules of EU and Member State law on SEP enforcement and FRAND licensing are the yardstick for the lion's share of PAE activity in Europe. Whether this attitude may change in the face of increasing PAE activity remains to be seen.

INJUNCTIONS

It must be kept in mind that, at present, there is no such thing as "EU patent law." Instead, patent laws and their rules on injunctions are national and may differ from Member State to Member State, although the European Patent Convention and a shared patent law tradition provide a certain degree of uniformity. German patent law, for instance, does not limit the right to an injunction in the case of patent infringement through an eBay-like balancing test. An infringer in Germany can, however, resist the entry of an injunction by successfully raising defenses such as the competition law-based entitlement to a (compulsory) FRAND license.³

³ It is worth noting that this competition law defense under European law is in addition to any contractual claims that a party may have with respect to its entitlement to a FRAND license.

The starting point for assessing SEP/FRAND injunction cases in Europe is the prohibition on abuses of market dominance found in Article 102 of the Treaty on the Functioning of the European Union (TFEU). Against this background, the success of an SEP-owning PAE seeking an injunction depends to a large extent on whether the PAE and the standard implementer/patent infringer comply with a set of conduct requirements established by the European Court of Justice (ECJ) in its 2015 decision in Huawei v. ZTE (a case that did not involve a PAE). According to the ECJ, an SEP owner may seek an injunction in spite of having made the promise to grant FRAND licenses, but "..., in order to prevent an action for a prohibitory injunction ... from being regarded as abusive, the owner of an SEP must comply with conditions which seek to ensure a fair balance between the interests concerned." Specifically:

- The SEP holder cannot, without violating Article 102 TFEU, seek an injunction against the alleged infringer without offering the alleged infringer a license, even if the SEP has already been used by the alleged infringer.
- After the alleged infringer has expressed its willingness to enter into a licensing agreement, the SEP holder must present a specific, written offer for a license on FRAND terms.
- · The standard implementer, in turn, must diligently respond to the SEP holder's offer, in accordance with recognized commercial practices in the field and in good faith, abstaining, in particular, from delaying tactics. Should the alleged infringer not accept the offer, it must submit a specific counter-offer that itself is FRAND. Furthermore, where the alleged infringer is infringing on the SEP before a licensing agreement has been concluded, it must, from the point at which its counter-offer is rejected, provide appropriate security, the amount of which is calculated on the basis of the royalties offered by the implementer. The alleged infringer must also render an account in respect of its use of the SEP.
- Where no agreement is reached following the counter-offer by the alleged infringer, the parties may, by common agreement, request that the amount of the FRAND royalty be determined by an independent third party.

In consequence (and simplifying somewhat): A patentee can obtain an injunction without violating Article 102 if the standard implementer fails to comply with the above procedures. If the blame lies with the patentee, no injunction is issued, and the implementer must be granted a FRAND license. If both parties comply with the procedures but cannot reach an agreement, the implementer is still entitled to a FRAND license, the conditions of which can be set by an "independent third party," such as a court or an arbitration tribunal. Courts (and maybe at some point the EU legislature or the EU Commission) are now in the process of working out details of the Huawei framework. Interestingly, the majority of post-Huawei cases involves PAEs, and they are frequently granted injunctions due to the implementer's failure to comply with the Huawei procedures. Appellate courts have, however, suspended the enforcement of a substantial number of these injunctions because they found that the lower courts did not properly interpret the *Huawei* conduct requirements.

DAMAGES

As with other elements of patent law, damages are primarily governed by EU Member State law. Under the German Patent Law, for example, a patent owner can recover monetary damages from an infringer that intentionally or negligently makes use of a patent. To determine the specific amount of monetary damages, the patent owner can select between three different calculation methods. The first method looks at the lost profits of the patent owner caused by the infringement (similar to lost profits damages under U.S. law as discussed above). If it uses this approach, the patent owner must prove that it could have obtained the profits claimed in the absence of the infringing activity [15]. The second calculation method, often called the "objective calculation of damages," is widely used in practice [id.]. It refers to the reasonable royalties that could be obtained from a third person for the use of the patent. The third method aims at the disgorgement of the infringer's profits. Since it is only a calculation method and not a standalone claim, it must be proven that the patent owner incurred actual losses [13]. Irrespective of the calculation method, courts are permitted to estimate the damages to be paid if the patent owner is not able to substantiate its financial losses [14].

Claims for damages in the SEP/FRAND context are not directly subject to the Huawei conduct requirements discussed above in the context of injunctions. Accordingly, an SEP owner is not acting abusively under Article 102 if it brings an action for damages, even without having offered a FRAND license. However, the Huawei requirements may have an indirect impact on the extent to which damages and a rendering of accounts may be due. While some courts limit all damages to FRAND levels in the presence of a FRAND commitment, there is also case law holding that, if a patentee fails to comply with Huawei, damages are limited to FRAND royalties for the period after the SEP holder's abusive refusal to license [16]. In any case, since a PAE does, by definition, not produce or market products, the "lost profits" it can recover under German law are only the profits that it could have realized by licensing the asserted patent [14].

PATENT TRANSFERS TO PAES

European case law discusses in some detail whether the transfer of a patent portfolio to a PAE, especially if motivated by the attempt to maximize licensing profits through "privateering" strategies, runs afoul of competition law. For example, the Dusseldorf Regional Court has found that such portfolio transfers are not subject to regulation as corporate mergers (Unwired Planet v. Samsung (2014)). Furthermore, such a portfolio transfer does not violate Articles 101 or 102 of the TFEU merely because it is performed for the purpose of improving the transferor's bargaining power or the overall return on the patent portfolio in question. Nor is the (PAE) transferee generally obliged to continue the licensing practice and maintain the licensing conditions of the former patent owner.

European case law discusses in some detail whether the transfer of a patent portfolio to a PAE, especially if motivated by the attempt to maximize licensing profits through "privateering" strategies, runs afoul of competition law. For example, the Dusseldorf Regional Court has found that such portfolio transfers are not subject to regulation as corporate mergers.

As a general tendency, competition law is more prominent in the European Union, while patent law is employed more intensely by U.S. courts. This may be due to the fact that, so far, patent law is not harmonized within the European Union. Whether these differences will be maintained following the - still very likely - introduction of the European Unified Patent Court and its creation of a Europewide litigation system in a combined market larger than the United States remains to be seen.

This being said, limitations on a patent transferee's conduct can arise from a FRAND commitment made by the prior patent owner, as the German courts state very clearly that competition law is violated where a transferee asks for licensing conditions above a FRAND level or discriminates among implementers. U.K. case law seems to take, for the time being, a slightly different turn. In Unwired Planet v. Huawei (EWHC 2017), which involved SEPs transferred to a PAE by an operating company, the court held that only substantial deviations from a single "true" FRAND royalty level amount to a violation of European competition law. The key question is where to draw the line beyond which FRAND transgressions become anticompetitive. According to the Dusseldorf Regional Court in Unwired Planet v. Samsung, this line can be crossed not only based on the PAE's licensing conditions, but also by an accumulation of licensing demands made by the PAE-transferee combined with those made by the transferor (with respect to its remaining portfolio), and potentially other SEP owners. Hence, the Dusseldorf court obliges the PAE to take into consideration at least the terms that are imposed by the transferor, so as to avoid a FRAND violation by the cumulative conditions. It is evident that these considerations are of great importance when multiple SEP holders make royalty claims on the same standardized product (a phenomenon sometimes referred to as royalty "stacking").

Courts are quite strict when it comes to the potential termination of a FRAND commitment after a patent portfolio transfer: The parties to such transactions are obliged by EU competition law to ensure that the PAE-transferee continues to be bound by any prior FRAND commitment made by holders of the transferred patents. This can, in particular, be achieved through clauses obliging the transferee to honor the transferor's FRAND commitment, to make such a commitment itself to the relevant standards organization, to abstain from seeking non-FRAND terms, and to impose the same obligations on any future transferee of the patent(s) in question. While binding a PAE-transferee to an existing FRAND commitment can be required by competition law, precise agreements regarding the PAE's future royalty demands may be less acceptable. Such agreements can amount to anticompetitive price fixing if, for example, a minimum royalty rate is defined. Calculating the purchase price for the patents in question by estimating the PAE's licensing revenues based on a pre-defined "applicable royalty rate" did not, however, amount to price fixing in Unwired Planet v. Samsung because the transferee was effectively free to charge royalty rates that differed from the "applicable" rate.

Since PAE-driven patent enforcement is usually preceded by the transactional acquisition of the asserted patents, it does not come as a surprise that defendants may try to attack the validity of these transactions, the patent ownership of the PAEs, and hence their standing in court. However, German courts have considered the registration of a patent owner, even a PAE, in the patent register to be a strong indication of the patent's ownership [17]. In consequence, courts have refused to pay much heed to allegations that patent transactions are, on their face, invalid.

Although not limited to the context of PAEs, this view of the courts is certainly supportive of their litigation efforts.

CONCLUSIONS

PAEs are playing an increasing role in patent litigation in both the United States and Europe. In response, courts have issued a variety of decisions in cases brought by PAEs. In the U.S., courts, led by the concurring justices in the Supreme Court's eBay decision, have expressed concern regarding the impact of PAEs on litigation as well as the economy more broadly. While courts have generally stopped short of enacting PAE-specific rules, a number of limitations on the remedies available to PAEs have been established through pre-existing doctrines limiting monetary recovery and injunctive relief applicable to non-practicing patent holders. In Europe, courts have been more reluctant to view PAEs differently than other patent holders. German courts, in particular, tend to follow a patentee-friendly approach, irrespective of the patentee's business model. This difference may, on one hand, result from differences in the roles that courts in the United States and Europe see themselves playing. In the United States, for example, courts are charged with assessing the impact on the public interest of issuing injunctions in patent cases, an analysis that necessarily involves assessments of the incentive value of patents as well as the economic impact of judicial rulings not only on the litigants, but on consumers and other market actors. In Europe, courts may view their roles as more circumscribed, interpreting rules that govern the relationships between holders of patent rights, but not extending to broader social or economic factors. These differences may be exacerbated by the relatively greater impact of PAE litigation on U.S. courts and markets. With comparatively lower damages awards and fewer patent suits overall, a more hands-off approach by European courts may be viewed as acceptable. As a general tendency, competition law is more prominent in the European Union, while patent law is employed more intensely by U.S. courts. This may be due to the fact that, so far, patent law is not harmonized within the European Union. Whether these differences will be maintained following the - still very likely - introduction of the European Unified Patent Court and its creation of a Europe-wide litigation system in a combined market larger than the United States remains to be seen.

ACKNOWLEDGMENTS AND DISCLOSURES

The authors thank the Editor and three anonymous peer reviewers for their valuable suggestions regarding this article. The research and writing of this article was not funded by any party and represents the authors' own views and opinions. Jorge L. Contreras has written and spoken extensively about intellectual property licensing in the context of technical standard setting. He has represented numerous clients with respect to standards development, as well as standards bodies such as the Internet Engineering Task Force (IETF), The Open Group, and Wireless Gigabit Alliance (WiGig), and has appeared as an expert witness in U.S. and non-U.S. litigation concerning standard-essential patents on behalf of both PAEs

and operating companies. Peter Georg Picht has written and spoken extensively on SEP/FRAND matters, including the issues discussed in this article. He was and is active as counsel for various clients in the ICT sector.

REFERENCES

- [1] RPX Corp., 2015 Report: NPE Litigation, Patent Marketplace, and NPE Cost, 2016.
- [2] B. J. Love et al., "Patent Assertion Entities in Europe," Patent Assertion Entities and Competition Policy, D.D. Sokol, Ed., 2017.
- [3] M.A. Lemley and A.D. Melamed, "Missing the Forest for the Trolls," 113 Colum. L. Rev. 2117, 2013.
- [4] EC Joint Research Centre, "JRC Science for Policy Report: Patent Assertion Entities in Europe," 2016.
- [5] J. L. Contreras, "Assertion of Standard Essential Patents by Non-Practicing Entities," Patent Assertion Entities and Competition Policy, D. D. Sokol, Ed., 2017. [6] C.B. Seaman, "Permanent Injunctions in Patent Litigation After
- eBay: An Empirical Study," 101 Iowa L. Rev. 1949, 2016.
- PricewaterhouseCoopers, "2017 Patent Litigation Study: Change on the Horizon?," 2017.
- [8] O. Liivak, "When Nominal is Reasonable: Damages for the Unpracticed Patent," 56 Boston Coll. L. Rev. 1031, 2015.
- [9] W. F. Lee and A. D. Melamed, "Breaking the Vicious Cycle of Patent Damages," 101 Cornell L. Rev. 385, 2016.
- [10] Apple Inc. v. Acacia Research Corp., Complaint. No. 16-CV-7266 at 2, 4, N. D. Cal., filed Dec. 20, 2016.
- [11] M.S. Popofsky and M. D. Laufert, "Antitrust Attacks on Patent Assertion Entities," 79 Antitrust L. J. 445, 2014.
- [12] OLG Düsseldorf, Jan. 13, 2016, I-15 U 66/15 Sisvel/ Haier, Rn. 11.

- [13] es/Mes, § 139 PatG N 6, 121.
- [14] Benkard/Grabinski/Zülch, § 139 PatG N 13 et seq.
- [15] Busse/Keukenschrijver, § 139 PatG N 97.
- [16] LG Düsseldorf, Jan. 19, 2016 Case No. 4b O 120/14 Unwired Planet/Samsung.
- [17] Kühnen, GRUR 2014, 137.

BIOGRAPHIES

JORGE L. CONTRERAS [SM] (jorge.contreras@law.utah.edu), J.D. (Harvard), B.S.E.E., B.A. (Rice University) is a professor of law at the University of Utah S.J. Quinney College of Law. He has written and spoken extensively in the areas of intellectual property policy and standards development and is the Editor of the two-volume Cambridge Handbook of Technical Standardization Law. He was awarded the 2018 IEEE Educational Activities Board and IEEE-SA Board of Governors Standards Education Award for "outstanding contributions to understanding the interaction of standardization systems with intellectual property rights, and educating students, policy makers and the public regarding these issues.

PETER GEORG PICHT studied law at Munich University and Yale Law School, did his Ph.D. (summa cum laude) at Munich University/the Max Planck Institute for Innovation and Competition, and holds a Master's degree from Yale Law School. In addition, he has been working, with the EU Commission's DG for Competition, as a senior research fellow with the Max Planck Institute for Innovation and Competition, as well as with the law firms Allen&Overy and Linklaters. He now holds a chair for Commercial Law at the University of Zurich and is head of the University's Centre for Intellectual Property and Competition Law (CIPCO). He remains affiliated with the Max Planck Institute as a research fellow.