

## RATIONALIZING FRAND ROYALTIES: CAN INTERPLEADER SAVE THE INTERNET OF THINGS

Jason R. Bartlett\*  
Jorge L. Contreras†

[Draft for Comment 22 Dec. 2016]

**ABSTRACT**—*Important technical interoperability standards may be covered by hundreds or thousands of patents held by dozens of parties. Patent holders are often required to license these patents to others on terms that are “fair, reasonable and non-discriminatory” (FRAND), and litigation regarding the level of FRAND royalties is expanding. One serious problem that has emerged is the inherent difficulty of determining a “reasonable” royalty rate for a particular standard-essential patent in isolation from the many other patents covering the same standard. Reasonable royalty determinations in litigation are made in a bottom-up manner, patent holder by patent holder, patent by patent, usually in separate proceedings. While individual royalty determinations in these proceedings may seem to adhere to judicial and contractual requirements regarding “reasonableness,” there is no reason to believe that the aggregate royalty rates established through these uncoordinated, serial processes will be reasonable in terms of the overall value that the patented technology contributes to the standard or the product. Unreasonable and inconsistent royalties on important interoperability standards create social costs by impeding value-creating transactions. To address this problem, we propose that the mechanism of statutory interpleader be used to join the holders of all patents covering a particular technology standard into a single proceeding in which an aggregate “reasonable” royalty may be determined and then apportioned among the holders of individual standards-essential patents. This approach will both enhance fairness of royalty determinations and reduce the costs inherent in multiple independent proceedings. Finding such a solution is particularly critical today, as technology convergence continues to impact standardization in key areas such*

---

\* Partner, Mauriel Kapouytian Woods LLP, San Francisco, CA.

† Associate Professor, University of Utah S.J. Quinney College of Law, Salt Lake City, UT, and Senior Policy Fellow, Program on Information Justice and Intellectual Property, American University Washington College of Law, Washington, DC. The preparation of this article was supported, in part, by an honorarium from the University of Texas at Austin out of a fund resulting from a gift to the University of Texas School of Law by Intel Corporation. This article has benefited from presentation and feedback at the 2016 Patent Damages Conference held at the University of Texas and from thoughtful comments, discussion and suggestions by Jeffrey Dean, Ben Edwards, Paul Gugliuzza, Cathy Hwang, Arti Rai, and Chris Seaman.

*as next-generation wireless communication and the “Internet of Things.”*

*Interpleader possesses on first acquaintance an attractiveness which is not exceeded by any other remedy known to the law.*

Professor Zechariah Chafee, Jr. (1921)<sup>1</sup>

## I. STANDARDS, PATENTS AND REASONABLE ROYALTIES

Technical interoperability standards such as Wi-Fi,<sup>2</sup> Bluetooth, HTTP and LTE enable products manufactured by different vendors to interact reliably and in a manner that is largely invisible to the consumer. The existence of such standards, and the widespread product interoperability that they enable, can reduce product development and manufacturing costs, increase consumer utility and produce significant market efficiencies known as “network effects.”<sup>3</sup>

Most of the technical standards currently deployed in products around the world were developed by market participants collaborating within voluntary associations known as standards-development organizations (SDOs).<sup>4</sup> Because of the significant market and consumer benefits that technical standards can confer, this degree of cooperation among competitors has long been viewed favorably by antitrust and competition

---

<sup>1</sup> Zechariah Chafee, Jr., *Modernizing Interpleader*, 30 YALE L.J. 814, 814 (1921).

<sup>2</sup> Wi-Fi is the trade name given to the 802.11 series of wireless networking standards developed by the IEEE Standards Association. In this article we use the terms Wi-Fi and 802.11 interchangeably.

<sup>3</sup> See CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 45–46 (1999), U.S. DEP’T OF JUSTICE & FED. TRADE COMM’N, ANTITRUST ENFORCEMENT AND INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 33 (2007) [hereinafter ANTITRUST & IPR REPORT] (citations omitted).

<sup>4</sup> SDOs include a broad range of organizations, from large, international bodies (e.g., the European Telecommunications Standards Institute (ETSI) (mobile telecommunications), the IEEE Standards Association (electronics and networking) and the Internet Engineering Task Force (IETF) (Internet)), to smaller groups often referred to as “consortia” that focus on one or a handful of related standards (e.g., the DVD 6C Forum, and Bluetooth Special Interest Group). See generally Brad Biddle et al., *The Expanding Role and Importance of Standards in the Information and Communications Technology Industry*, 52 JURIMETRICS 177 (2012) (describing the standards-development ‘ecosystem’); AM. BAR ASS’N, STANDARDS DEVELOPMENT PATENT POLICY MANUAL ix–xi (Jorge L. Contreras ed., 2007) [hereinafter ABA Patent Policy Manual] (describing organizations involved in standard-setting).

law agencies, who might ordinarily be wary of such large-scale coordination efforts.<sup>5</sup> The importance of technical interoperability standards continues to grow in today’s interconnected global economy. Efforts are under way to develop the next generation of mobile broadband communications standards known as “5G”,<sup>6</sup> as well as standards that will link a bewildering array of devices in vehicles, buildings and the environment known as the “Internet of Things.”<sup>7</sup>

#### *A. Patents and Standards*

It is well-documented that hundreds, if not thousands, of patents often cover important interoperability standards. Table 1 below shows estimated patent coverage of several widely-adopted standards:

---

<sup>5</sup> See, e.g., ANTITRUST & IPR REPORT, *supra* note 3, at 33.

<sup>6</sup> See Balazs Bertenyi, *3GPP System Standards Heading into the 5G Era*, available at [http://www.3gpp.org/news-events/3gpp-news/1614-sa\\_5g](http://www.3gpp.org/news-events/3gpp-news/1614-sa_5g).

<sup>7</sup> See Pelle Högnelid & Thomas Kalling, *Internet of Things and Business Models – Empirical Illustrations of How the Business Model Concept Helps Us to Understand Strategic Implications of Internet of Things Investments*, Proceedings of the 9<sup>th</sup> International Conference on Standardization and Innovation in Information Technology (IEEE-SIIT), Oct. 6-8, 2015, at 13.

Table 1

Standard	SDO	Patent Coverage Estimates <sup>8</sup>
MPEG-2	MPEG	800 patent families <sup>9</sup>
3G WCDMA	ETSI	1,000 patent families <sup>10</sup>
3G UMTS	ETSI/3GPP	43,658 patent disclosures <sup>11</sup>
4G LTE	ETSI	61,831 patent disclosures <sup>12</sup> 1,000 patent families <sup>13</sup>
802.11 (Wi-Fi)	IEEE	3,000 patents <sup>14</sup>

Both the overall number of SEPs and the number of different firms holding SEPs has steadily increased over the years.<sup>15</sup> In a 2015 survey,

<sup>8</sup> Different studies have used different measures to assess the number of patents covering particular standards. Some studies count the number of patents disclosed in individual SDO participants' written declarations to an SDO. See Justus Baron & Tim Pohlmann, *Mapping Standards to Patents Using Databases of Declared Standard-Essential Patents and Systems of Technological Classification* 9–10 (Regulation & Econ. Growth Working Paper, 2015), [http://www.law.northwestern.edu/research-faculty/searlecenter/innovationeconomics/documents/Baron\\_Pohlmann\\_Mapping\\_Standard\\_s.pdf](http://www.law.northwestern.edu/research-faculty/searlecenter/innovationeconomics/documents/Baron_Pohlmann_Mapping_Standard_s.pdf). It is possible that multiple declarations may list the same patents, as multiple co-owners of individual patents may each file declarations, patent owners may file new declarations as a standard evolves or as patent applications mature into issued patents, or different features of a standardized technology are covered by the same patent(s). Other studies are based on industry analysis of the number of patent families believed to be essential to particular standards. See KNUT BLIND ET AL., *STUDY ON THE INTERPLAY BETWEEN STANDARDS AND INTELLECTUAL PROPERTY RIGHTS (IPRs)*, FINAL REPORT 62 (2011), available at [http://ec.europa.eu/enterprise/policies/european-standards/files/standards\\_policy/ipr-workshop/ipr\\_study\\_final\\_report\\_en.pdf](http://ec.europa.eu/enterprise/policies/european-standards/files/standards_policy/ipr-workshop/ipr_study_final_report_en.pdf). A patent "family" is generally a group of patents around the world that relate to the same invention and often trace their lineage to a single original patent application. See Blind et al, *supra*, at 133-34, n. 42. Thus, there can be dozens or more individual patents within a single patent family.

<sup>9</sup> Blind et al, *supra* note 8, at 62.

<sup>10</sup> *Id.*

<sup>11</sup> Baron & Pohlmann, *supra* note 8, at 20, Table 5.

<sup>12</sup> *Id.*

<sup>13</sup> Blind et al, *supra* note 8, at 62.

<sup>14</sup> Innovatio

<sup>15</sup> Rudi Bekkers & Joel West, *The limits to IPR Standardization Policies as evidenced*

Baron and Pohlmann identified SEP disclosures made by more than 2,000 different firms and organizations.<sup>16</sup> An earlier 2011 study identified 292 holders of patents relevant to the telecommunications-focused standards.<sup>17</sup> Court records in the *Microsoft v. Motorola* case indicate that there are 92 holders of SEPs covering the Wi-Fi standard alone.<sup>18</sup>

When the total number of standards embodied in a complex technology product is multiplied by the number of patents covering each standard, large numbers invariably result. For example, in 2011, RPX, a defensive patent aggregator, estimated that at least 250,000 different patents cover an average smartphone.<sup>19</sup> It is likely that the numbers of patents and patent holders in standardized product markets will continue to grow as the complexity of technology products increases and pressure toward increasing convergence and interconnectedness fuels technology product markets.

The nascent Internet of Things draws into sharp focus this trend and the potential barriers that may be imposed on technical innovation and competition by large numbers of overlapping patents. As Fiona Scott Morton and Carl Shapiro have observed,

[T]he ‘Internet of Things’ is a new and growing area where royalty stacking and patent hold-up appear to be very real dangers. Devices of all sorts, from thermostats to railroad cars to refrigerators, are being given mobile connectivity using standards developed by SSOs. The price of those chips, and whether they cost \$5 or \$0.50 or \$0.005, will determine the

---

by *Strategic Patenting in UMTS*, 33 TELECOM. POL. 80-97 (2009) (finding an eightfold increase in the number of disclosed essential patents for UMTS (1,227) over GSM (140), as well as a threefold increase in the number of patent holders (23 to 72)).

<sup>16</sup> Baron & Pohlmann, *supra* note 8, at 13.

<sup>17</sup> Blind et al, *supra* note 8.

<sup>18</sup> *Microsoft Corp. v. Motorola, Inc.*, Findings of Fact and Conclusions of Law, 2013 U.S. Dist. LEXIS 60233 at \*213 (W.D. Wash., Apr. 25, 2013), *aff’d* 795 F.3d 1024 (9th Cir. 2015) [hereinafter *Microsoft v. Motorola Findings*].

<sup>19</sup> RPX Corp., Registration Statement on Form S-1 at p. 55 (Jan. 21, 2011) (“Based on our research, we believe there are more than 250,000 active patents relevant to today’s smartphones, a significant increase compared to our estimate of approximately 70,000 patents that were active and relevant to mobile phones in 2000. This growth can be attributed to the expanded set of features and functionality incorporated in today’s smartphones, including touchscreens, internet access, streaming video, media playback, application store readiness and other web-based services, and WiFi connectivity options”).

nature of new applications and the rate of adoption. Failure to prevent patent hold-up relating to tomorrow's information technology and communications standards is likely to cause significant social welfare loss in the years ahead.<sup>20</sup>

### B. SDOs and FRAND Commitments

In order to address concerns about potential leverage exerted by holders of patents covering widely-adopted standards (so-called patent "hold-up"), many SDOs have adopted policies requiring their participants to license essential patents on terms that are royalty-free or which bear "fair, reasonable and non-discriminatory" (FRAND) royalties<sup>21</sup> All SDOs accredited by the American National Standards Institute (ANSI) must require such commitments,<sup>22</sup> as do many other SDOs worldwide.<sup>23</sup>

Despite the widespread usage of FRAND commitments, there is little consensus regarding the precise meaning of such commitments, particularly with regard to the level of royalties that would be considered "fair" and "reasonable." No SDO of which we are aware defines precisely what these terms mean,<sup>24</sup> and many SDOs affirmatively disclaim any role in

---

<sup>20</sup> Fiona Scott Morton & Carl Shapiro, "Patent Assertions: Are We Any Closer to Aligning Reward to Contribution?" *NBER Working Paper No. 21678* (2015) at 32.

<sup>21</sup> Following customary practice, we use the terms FRAND and RAND (reasonable and nondiscriminatory) interchangeably. See U.S. DEP'T OF JUSTICE & U.S. PATENT & TRADEMARK OFFICE, POLICY STATEMENT ON REMEDIES FOR STANDARDS-ESSENTIAL PATENTS SUBJECT TO VOLUNTARY F/RAND COMMITMENTS 1 n.2 (2013) [hereinafter DOJ/PTO POLICY STATEMENT], available at <http://www.justice.gov/atr/public/guidelines/290994.pdf>.

<sup>22</sup> ANSI ESSENTIAL REQUIREMENTS: DUE PROCESS REQUIREMENTS FOR AMERICAN NATIONAL STANDARDS § 3.1.1, at 10–11 (AM. NAT'L STANDARDS INST. 2015).

<sup>23</sup> See Rudi Bekkers & Andrew Updegrave, A Study of IPR Policies and Practices of a Representative Group of Standards Setting Organizations Worldwide 89 tbl.13 (2012), [http://sites.nationalacademies.org/xpeditio/groups/pgasite/documents/webpage/pga\\_072197.pdf](http://sites.nationalacademies.org/xpeditio/groups/pgasite/documents/webpage/pga_072197.pdf) (of ten major SDOs studied, eight explicitly specify FRAND licensing as an option in their IPR policies); Brad Biddle, Andrew White & Sean Woods, *How Many Standards in a Laptop? (And Other Empirical Questions)*, 2010 INT'L TELECOMM. UNION SEC. TELECOMM. STANDARDIZATION, KALEIDOSCOPE ACAD. CONF. PROC. at 3 & fig. 2 (75 percent of the laptop computer standards studied were subject to a RAND commitment and 22 percent were royalty-free); Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 CALIF. L. REV. 1889, 1906 (2002) (of 36 SDO policies studied, 29 required, and 3 encouraged, FRAND licensing).

<sup>24</sup> Notwithstanding this general reticence, at least one SDO (IEEE-SA) has recently attempted to introduce clarifications to its FRAND licensing commitments, but even these fall short of defining any numerical rate or range for royalties. See Michael A. Lindsay &

establishing, interpreting, or adjudicating the reasonableness of FRAND royalty rates.<sup>25</sup> In fact, some SDOs expressly prohibit the discussion of royalties and other licensing terms at SDO-sponsored activities.<sup>26</sup> Though some commentators have argued that SDOs can and should play a greater role in defining the nature and scope of their FRAND commitments,<sup>27</sup> concerns arising from antitrust law, complexity, efficiency and cost have, in general, thwarted most attempts by SDOs to provide such guidance.<sup>28</sup>

Given this lack of guidance from SDOs, parties have increasingly sought to resolve disputes regarding FRAND royalty rates through litigation.<sup>29</sup> Accordingly, a growing number of courts have been called upon to adjudicate the level of royalties that comply with a SEP holder's FRAND licensing commitments. While such obligations originate in SDO

---

Konstantinos Karachalios, *Updating a Patent Policy: The IEEE Experience*, CPI ANTITRUST CHRONICLE, Mar. 2015.

<sup>25</sup> See, e.g., IEEE Standards Assn., IEEE-SA Standards Board Bylaws § 6.2 (2016), [http://standards.ieee.org/develop/policies/bylaws/sb\\_bylaws.pdf](http://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf) (“The IEEE is not responsible for . . . determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory.”); Scott Bradner, Intellectual Property Rights in IETF Technology, Request for Comments 3979, § 4.1 (2005), [http://datatracker.ietf.org/doc/rfc3979/?include\\_text=1](http://datatracker.ietf.org/doc/rfc3979/?include_text=1) (“[IETF] will not make any explicit determination that the assurance of reasonable and non-discriminatory terms or any other terms for the use of an Implementing Technology has been fulfilled in practice.”).

<sup>26</sup> See, e.g., IEEE Standards Assn., IEEE-SA Standards Board Operations Manual § 5.3.10.2 (2015), [http://standards.ieee.org/develop/policies/opman/sb\\_om.pdf](http://standards.ieee.org/develop/policies/opman/sb_om.pdf) (“No discussions or other communications regarding the following topics shall occur during IEEE-SA working group standards-development meetings or other duly authorized IEEE-SA standards-development technical activities: . . . the essentiality, interpretation, or validity of patent claims; specific patent license terms or other intellectual property rights. . .”).

<sup>27</sup> See, e.g., Stanley M. Besen, *Why Royalties for Standard Essential Patents Should Not Be Set by the Courts*, 15 CHI-KENT J. INTELL. PROP. 1 (2016) (arguing that SDOs, rather than courts, are best-equipped to make FRAND royalty determinations), Jorge L. Contreras, *Fixing FRAND: A Pseudo-Pool Approach to Standards-Based Patent Licensing*, 79 ANTITRUST L.J. 47, 51-52 (2013).

<sup>28</sup> See Contreras, *Fixing FRAND*, *supra* note 27, at 51-52 (discussing reasons for prohibitions), Lemley, *supra* note , at 1965 (observing that such restrictions are generally intended to shield SDOs from antitrust liability for collusive price fixing by their participants).

<sup>29</sup> The stakes in such litigation are sometimes high. For example, in *Microsoft v. Motorola*, the patent holder's original demand for royalties subject to a (F)RAND commitment could have resulted in annual royalty payments of approximately \$4 billion. Instead, the court awarded Motorola royalties that amounted, in the aggregate, to approximately \$1.8 million per year. See Steven Musil, *Court Sides with Microsoft over Motorola Patents used in Xbox*, CNET, Apr. 25, 2013.

policies and voluntary commitments made by SDO participants, courts seeking to interpret these obligations have looked largely to the federal law of patent damages to determine what “reasonable” royalties ought to be.<sup>30</sup>

### *C. Reasonable Royalties, Incremental Value and Apportionment*

Section 284 of the Patent Act provides that, upon a finding of infringement, “the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a *reasonable royalty* for the use the infringer made of the invention . . . .”<sup>31</sup> One of the key tenets of reasonable royalty damages is that “the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product.”<sup>32</sup> This “incremental value” framework can be traced at least back to the Supreme Court’s 1915 decision in *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*<sup>33</sup> Today, the incremental value measure is one of fifteen factors incorporated into the *Georgia-Pacific* “hypothetical negotiation” framework for calculating patent damages.<sup>34</sup> The incremental value approach requires a court to determine what portion of the overall product value the patented feature contributes, in view of all the other features of the product.<sup>35</sup> This analysis is often referred to as “apportionment.”<sup>36</sup>

---

<sup>30</sup> See Jorge L. Contreras & Richard J. Gilbert, *A Unified Framework for RAND and other Reasonable Royalties*, 30 BERKELEY TECH. L.J. 1451, 1465-67 (2015) (despite the private origins of FRAND royalty commitments, courts have largely (and correctly) decided to calculate FRAND royalty levels using patent law reasonable royalty damages methodologies).

<sup>31</sup> Act of July 19, 1952, Pub. L. No. 82-593, 66 Stat. 812, codified at 35 U.S.C. § 284 (2012) (emphasis added). Damages for “lost profits” are also available under 35 U.S.C. § 284, but these are beyond the scope of this article.

<sup>32</sup> *Ericsson, Inc. v. D-Link Systems, Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014).

<sup>33</sup> *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 648 (1915).

<sup>34</sup> *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff’d*, 446 F.2d 295 (2d Cir. 1971) (Factor 13 instructs the jury to consider “[t]he portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer”). For a discussion of the use of the *Georgia-Pacific* analysis in patent cases, see generally, Contreras & Gilbert, *supra* note 30, at x; Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1697-99 (2010).

<sup>35</sup> *Ericsson*, 773 F.3d at 1226.

<sup>36</sup> *Id.*

#### *D. The Bottom-Up Approach – A Recipe for Inconsistency*

A bottom-up approach to royalty calculation assesses the incremental value of individual patents in different suits without reference to the other patents covering the same standard or product. For example, consider a hypothetical product with 50 principal features,<sup>37</sup> 40 of which are patented. Suppose that there are 1000 patents covering patented features, and that 25 of these patents cover Feature A, which is characterized by conformance to an SDO-developed interoperability standard bearing a FRAND licensing commitment. Firm X holds 5 patents covering Feature A, and Firm Y wishes to manufacture and sell the hypothetical product.

In the first instance, Firms X and Y should negotiate regarding the necessary license for X's patents. However, if that negotiation fails, despite the good faith efforts of the parties, and X may bring an infringement action against Y, or Y may bring an action against X for breach of its FRAND commitment.<sup>38</sup> In either case, a court may be required to determine the reasonable royalty that Y should pay to X for the use of X's patents.

To determine this "reasonable royalty", the court must determine the incremental value that X's patented technology contributes to the overall product's value. Following the reasoning employed in *Microsoft v. Motorola*, this analysis involves a determination of both the importance of X's patented technology to the standard (Feature A), and the overall importance of Feature A to the product.<sup>39</sup> Suppose that Feature A is found to be exceptionally important and thus contributes 5% to the overall value of the product (which has 50 principal features), and that X's patented technology is found to contribute 25% of the value of Feature A. The

---

<sup>37</sup> For purposes of this analysis, we consider product "features" to include not only technological capabilities such as 802.11a/b/g/n/ab connectivity, a sensitive touch-screen, and a 10 MP camera, but also aesthetic design features, customer support, and firm reputation.

<sup>38</sup> Such an action may be brought under a variety of theories including contract, estoppel, antitrust and others. See Jorge L. Contreras, *A Market Reliance Theory for FRAND Commitments and Other Patent Pledges*, 2015 UTAH L. REV 479 (2015) (discussing different theories for enforcement of FRAND commitments)...

<sup>39</sup> *Microsoft v. Motorola Findings*, *supra* note x, at x (using a modified version of the *Georgia-Pacific* analysis to take into account the royalty rates charged by private firms and patent pools for patents essential to the same standards, assess the importance of Motorola's patents to the standards in question and the importance of the standards to the infringing products, and account for the total number of patents being asserted in comparison to the total number of patents covering each standard).

incremental value of X's patents is thus 1.25% of the total value of the product, and X may be entitled to a royalty equal to 1.25% of the royalty base.

But now suppose that, concurrently with this action, Y is unable to reach terms with Firm Z, which holds a different patent covering Feature A of the same product. A different court, perhaps in a different jurisdiction, must undertake the same analysis with respect to Feature A and Z's patents. The first court determined the value of X's 5 patents covering Feature A, and in doing so it must have, explicitly or implicitly, determined the value of the other 20 patents covering Feature A, including Z's patents. Will the first and second courts ascribe the same value to Z's patents? Absent some coordination between the finders of fact, it is almost certainly the case that their respective values for Z's patents will differ.<sup>40</sup> And what about W's three patents covering Feature A, the value of which should also impact the relative incremental value of both X's and Z's patents, but is not the subject of either judicial proceeding? Will either court make a specific determination of the value of W's patents? Again, this is highly doubtful and, if so, it is likely that these determinations will differ.

Why do these discrepancies matter? Because ultimately, when the "incremental" value of all 1,000 patents covering the features of the product are added together with the value of the unpatented features, the total should equal 100%, no more and no less. Yet when the "value" of every element is calculated separately, and some are not explicitly calculated at all, it is likely that this total will be widely divergent from 100%. If the total is lower, then some patent holders are likely be undercompensated for their contributions, and if the total is higher, then Y is over-paying to manufacture the product. Both over- and under-payment in this context yield inefficiencies that will result in either under-investment in R&D by technology contributors, under-investment in product manufacture or increases in consumer prices above their efficient level.

These inefficiencies arise from the serial, "bottom-up" nature of the reasonable royalty calculation. That is, the royalty due to every patent holder is determined individually without reference to the other patents

---

<sup>40</sup> There is no reason to believe that different courts, with different parties before them, will admit evidence from unrelated proceedings regarding the valuation of different patents not before them. Likewise, the different parties will likely insist on their own experts and analysis, making it even less likely that consistent results will be reached.

covering the same standard or product. Even if such a royalty might meet some test of reasonableness if considered in isolation, it is likely to be unreasonable when combined with other independently-calculated royalties applied to the same product. In the next Part, we take a closer look at the weaknesses of the bottom-up FRAND royalty calculation approach and, in Part III, offer a “top-down” alternative based on the statutory interpleader mechanism.

## II. WEAKNESSES OF BOTTOM-UP APPROACHES TO FRAND ROYALTY CALCULATION

Despite its growing acceptance as the preferred methodology for calculating FRAND royalties, the bottom-up approach described in Part I.D suffers from significant weaknesses that make its results both unreliable and potentially unfair at multiple levels. Bottom-up royalty determinations, by their nature, consider only the patent(s) being adjudicated, with little or no weight given to other patents covering the same standard or product. The result can be a situation in which different courts determine very different aggregate royalty levels for the same standard.<sup>41</sup>

The degree to which bottom-up royalty determinations can diverge among courts is illustrated dramatically by the different FRAND royalty rates judicially established for the Wi-Fi standard. There are at least five published U.S. decisions adjudicating royalty rates for SEPs covering the standard, the results of which are summarized in Table 2 below:<sup>42</sup>

---

<sup>41</sup> Paul Gugliuzza identifies a similar need for consistency among court determinations with respect to patent validity and claim interpretation, i.e., that “the claims of a particular patent should be construed similarly from one case to another and that courts should not reach inconsistent validity findings regarding the same patent.” Paul R. Gugliuzza, *Patent Law Federalism*, 2014 WISC. L. REV. 11, 21 (2014). He refers to this principle as “adjudicative uniformity” and notes that it has been emphasized by both the Court of Appeals for the Federal Circuit and the Supreme Court. *Id.* at 26, 51.

<sup>42</sup> See notes x, *supra*, and accompanying text.

Table 2  
U.S. Litigated FRAND Royalty Determinations for 802.11 (Wi-Fi)  
Standard-Essential Patents

Case	Court (year) <sup>43</sup>	Royalty
<i>Microsoft v. Motorola</i> <sup>44</sup>	W.D. Wash. (2013)	\$0.035 per unit
<i>In re Innovatio</i> <sup>45</sup>	N.D. Ill. (2013)	\$0.0956 per unit
<i>Ericsson v. D-Link</i> <sup>46</sup>	E.D. Tex. (2013)	\$0.15 per unit
<i>Realtek v. LSI</i> <sup>47</sup>	N.D. Cal. (2014)	0.12% of net sales
<i>CSIRO v. Cisco</i> <sup>48</sup>	E.D. Tex. (2014)	Up to \$1.90 per unit

The inconsistencies raised by the independent determination in these cases not only of individual patent valuations, but of the overall royalty allotted to the standard are manifest. For example, if the maximum reasonable aggregate Wi-Fi royalty is \$1.80 per chip (as the Northern District of Illinois found in *Innovatio*)<sup>49</sup> then these judgments alone exceed the maximum. Suppose that each of these royalty rates were applied to a hypothetical Wi-Fi router that retails for \$50.00. The aggregate royalty based on these outcomes would be as much as \$2.2406 (nearly 4.5% of the product sale price) for the 35 adjudicated patents alone.<sup>50</sup> This suggests that the aggregate royalty for all 3,000 essential Wi-Fi patents,<sup>51</sup> if they were asserted, would be orders of magnitude greater than that.<sup>52</sup> The underlying causes of some of these issues are discussed in greater detail below.

<sup>43</sup> Cited decisions are to the federal district court decision in which the royalty was determined. Subsequent proceedings and appeals are not listed.

<sup>44</sup> *Microsoft Corp. v. Motorola, Inc.*, 2013 U.S. Dist. LEXIS 60233, \*297-298 (W.D. Wash. Apr. 25, 2013).

<sup>45</sup> 2013 U.S. Dist. LEXIS 144061 at \*183.

<sup>46</sup> *Ericsson Inc. v. D-Link Sys.*, 2013 U.S. Dist. LEXIS 110585, \*72 (E.D. Tex. Aug. 6, 2013).

<sup>47</sup> *Realtek Semiconductor Corp. v. LSI Corp. and Agere Sys. LLC*, 12-CV-3451, JURY VERDICT FORM, Dkt. No. 324 (N.D. Cal. Feb. 26, 2014).

<sup>48</sup> *Commonwealth Sci. & Indus. Research Organisation v. Cisco Sys.*, 2014 U.S. Dist. LEXIS 107612, \*51 (E.D. Tex. July 23, 2014).

<sup>49</sup> 2013 U.S. Dist. LEXIS 144061, \*182.

<sup>50</sup>  $0.12\% * 50 = 0.06$  (Realtek) + 0.035 (Microsoft) + 0.0956 (Innovatio) + 0.15 (Ericsson) + 1.90 (CSIRO) = 2.2406.

<sup>51</sup> *Id.* at \*179; [*Also Microsoft; Ericsson*]

<sup>52</sup> While some of these judgments were vacated on appeal, that does not diminish the risk that they represent to manufacturers of Wi-Fi compliant products.

### A. Royalty Stacking

As suggested above, to the extent that multiple owners of patents covering a single standard or product charge royalties to a manufacturer, the cumulative effect of those royalty demands can be considerable. This phenomenon is often called royalty “stacking”. As the U.S. Court of Appeals for the Federal Circuit has observed,

[r]oyalty stacking can arise when a standard implicates numerous patents, perhaps hundreds, if not thousands. If companies are forced to pay royalties to all [patent] holders, the royalties will ‘stack’ on top of each other and may become excessive in the aggregate.”<sup>53</sup>

The potential for royalty stacking in products covered by multiple patented standards has resulted in attempts to estimate the overall royalty burden on particular products. For example, one 2013 study estimated that the size of the aggregate royalty stack for a hypothetical \$400 smart phone was \$120 (excluding the value of cross-licenses and other non-monetary compensation), or 30% of the overall product price.<sup>54</sup> Moreover, in the context of litigation, Bill Lee and Doug Melamed observe that

When thousands of patents or other inputs are involved in the same device, judges and juries consistently and systematically

<sup>53</sup> *Ericsson*, 773 F.3d at 1209.

<sup>54</sup> Ann Armstrong, Joseph J. Mueller, & Timothy D. Syrett, *The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones* (Working Paper, May 29, 2014), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2443848](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2443848). Keith Mallinson challenges this result, estimating an aggregate smart phone royalty burden of approximately 5%, based on estimated industry-wide annual U.S. smart phone SEP licensing revenue of \$19 billion. Mallinson, Keith. 2015. “Smartphone Revolution: Technology Patenting and Licensing Fosters Innovation, Market Entry, and Exceptional Growth,” *IEEE Consumer Electronics Magazine*, Apr. 2015, 60-66. Anne Layne-Farrar also disputes the analysis by Armstrong, Mueller and Syrett on several counts. Anne Layne-Farrar, “Patent Holdup and Royalty Stacking Theory and Evidence: Where Do We Stand After 15 Years of History?” (Submitted for 122nd Meeting of the OECD Competition Committee, Dec. 17-18, 2014), <http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/W D%282014%2984&doclanguage=en>

overemphasize the value of the single patent (or patents) at issue as compared to all the other inputs.<sup>55</sup>

If royalties on the patents covering a standard become excessive through stacking, then the standard may not be widely implemented and consumers will be harmed. What's more, the incentive of parties holding few or no essential patents to continue to develop the standard may decrease. In such situations, the stacking of standards-essential patents may impede rather than encourage innovation.

Courts differ in their approaches to royalty stacking. As noted in Part I.D above, a court determining the incremental value of a patent for purposes of determining a reasonable royalty *should* consider the value of all other patents covering the same standard or product. The district court in *Microsoft v. Motorola* acknowledges this, stating:

Motorola's royalty request for its 802.11 SEP portfolio raises significant stacking concerns. There are at least 92 entities that own 802.11 [standard-essential patents]. If each of these 92 entities sought royalties similar to Motorola's request of 1.15 % to 1.73 % of the end-product price, the aggregate royalty to implement the 802.11 Standard, which is only one feature of the Xbox product, would exceed the total product price.<sup>56</sup>

Likewise, in *In re Innovatio IP Ventures, LLC*,<sup>57</sup> the court was required to calculate the "reasonable" royalty for patents covering different aspects of the 802.11 Wi-Fi standard. In doing so, it expressly recognized that it must "evaluate a proposed RAND rate in the light of the total royalties an implementer would have to pay to practice the standard" and "consider whether the overall royalty of all standard-essential patents would prohibit widespread adoption of the standard."<sup>58</sup> Accordingly, the existence of royalty stacking as to the Wi-Fi standard played a significant role in the

---

<sup>55</sup> William F. Lee & A. Douglas Melamed, *Breaking the Vicious Cycle of Patent Damages*, 101 CORNELL L. REV. 385, 427 (2014).

<sup>56</sup> *Microsoft Corp. v. Motorola, Inc.*, Findings of Fact and Conclusions of Law, 2013 U.S. Dist. LEXIS 60233 at \*213 (W.D. Wash., Apr. 25, 2013), *aff'd* 795 F.3d 1024 (9th Cir. 2015).

<sup>57</sup> 2013 U.S. Dist. LEXIS 144061 (N.D. Ill. Oct. 3, 2013).

<sup>58</sup> *Id.* at 69-70.

court's fixing the upper limit on the applicable royalty at the manufacturer's existing profit margin.<sup>59</sup>

In *Ericsson v. D-Link*, the Federal Circuit reaffirmed both the potential for royalty stacking and the need to apportion royalties to a SEP holder based on the value that its patented technology bears to the overall product.<sup>60</sup> However, it also upheld the district court's refusal to instruct the jury on royalty stacking when the defendant "failed to provide any evidence of actual royalty stacking."<sup>61</sup> It explained that "[t]he mere fact that thousands of patents are declared to be essential to a standard does not mean that a standard-compliant company will necessarily have to pay a royalty to each SEP holder."<sup>62</sup> This reasoning is counterintuitive. The "mere" fact that thousands of patents are essential to a particular standard is, in actuality, very relevant to the reasonableness of the royalty levied on the standard. That is, as discussed above, a reasonable royalty is based on the *incremental value* of the patented technology to the overall product.<sup>63</sup> Thus, relevant factors in determining the incremental value of a particular patented technology *must* include the quantity of additional patented technologies included in the same product.<sup>64</sup> As Jorge Contreras and Richard Gilbert have argued,

---

<sup>59</sup> *Id.* at 166-67.

<sup>60</sup> *Ericsson*.

<sup>61</sup> 773 F.3d at 1234.

<sup>62</sup> *Id.*

<sup>63</sup> *Id.* at 1232, 1235. *See also* note x, *supra*, and accompanying text.

<sup>64</sup> As Contreras has previously argued with respect to the *Ericsson* decision:

"What is less relevant is whether the accused infringer is then paying royalties to other patent holders, and in what amounts. The answer to this question depends on a host of factors, including ... the *timing* of different infringement suits. Thus ... when the first of fifty patent holders enforces its patent against the infringer, it may be paying no other royalties. When the second patent holder sues, the infringer may be paying royalties to the first patent holder. And when the third sues, the infringer may be paying royalties to the two prior patent holders. And so forth. Does this mean that in the first suit, the infringer can introduce no evidence of stacking, while in the second suit, it can introduce evidence of the amounts paid to the first patent holder, and so on? Such a result makes little sense and, if anything, will encourage a "race to the courthouse" by patent holders wishing to capture the maximum royalty before the infringer is burdened by other royalty obligations.

Jorge L. Contreras, *Standards, Royalty Stacking and Collective Action*, 3 CPI ANTITRUST CHRON. (2015).

In an industry characterized by multiple patents that cover component technologies of a product that implements many technologies, the incremental value of a particular patented component technology to the overall product value is likely to be lower if many other patented technologies also compete for a share of the overall product value. As a result, it is reasonable to introduce evidence regarding the number of patents and other patented technologies in the overall product when assessing the incremental value of a particular patented technology.

Conversely, withholding evidence regarding the total field of patents covering a particular product or standard may lead a fact finder to overestimate the incremental value of the patent at issue (as knowing that a particular patent is only one of a thousand covering a product is likely to result in a different assessment of the patent's worth than believing it is the sole patent germane to the product).<sup>65</sup>

It is thus possible that the Federal Circuit's reasoning regarding the royalty stacking instruction in *Ericsson* can be attributed to deficiencies in the defendant's evidentiary record, rather than a general rejection of the basic concept that the quantity of other patented technologies in the same standard is relevant to the apportionment analysis that is always required to determine a reasonable royalty.

### *B. Evidentiary Deficits*

One of the biggest challenges courts face when seeking to assess royalty rates in SEP cases is a lack of accurate information regarding the relevant technology and patents.<sup>66</sup> The Part discusses some of the ways in which the evidence considered by courts in making such determinations is insufficient, at best, and misleading, at worst.

#### 1. Over-Declaration of SEPs

Despite SDO rules that require patents to be declared only if they are (or are likely to be) "essential" to the implementation of a standard, there is

---

<sup>65</sup> *Contreras & Gilbert, supra* note 30, at 1485.

<sup>66</sup> *See Besen, supra* note x, at 42.

typically no independent verification of a declared patent's essentiality.<sup>67</sup> The designation of a patent as a SEP is thus entirely in the discretion of the patent holder, subject only to a contravening determination in litigation.<sup>68</sup> Given that patent holders could face serious liability for *failing* to disclose essential patents to an SDO (including claims of anticompetitive behavior, fraud, and deceptive conduct),<sup>69</sup> they have a strong incentive to disclose all patents that have even a remote possibility of being relevant to a standard. These incentives have resulted in significant over-disclosure of patents to SDOs, as shown in recent studies finding that less than half of patent families declared "essential" to ETSI's 2G, 3G and 4G wireless telecommunications standards, respectively, were actually essential to implementation of those standards.<sup>70</sup>

While the factors leading to over-disclosure can be understood, it must also be recognized that over-disclosure distorts the overall picture of patent coverage of particular standards. Thus, a standard covered by 1,000 patents may look very different, from a royalty standpoint, than a standard covered by 250 patents. Moreover, the actual technical value contributed by those patent holders who have over-disclosed most aggressively may be greatly overstated and reduced or eliminated entirely if essentiality were assessed more carefully. Yet the serial, bottom-up approach to royalty calculation allows the essentiality of patents to be tested only when they are asserted in litigation, patent holder by patent holder.<sup>71</sup>

---

<sup>67</sup> SDOs do not make essentiality determinations, at least in part due to resource constraints and concerns over efficiency and member relations. This situation is different than in patent pools, in which significant ex ante investments are made to verify the "essentiality" of all patents proposed to be included in the pool. *See, generally*, Contreras, Fixing FRAND, *supra* note 27, at 76-77.

<sup>68</sup> *See, e.g.*, Lemley, *supra* note x, at 157; Contreras, Fixing FRAND, *supra* note 27, at 60-62.

<sup>69</sup> *See, e.g.*, *Qualcomm Inc. v. Broadcom Corp.*, 548 F.3d 1004 (Fed. Cir. 2008); *Rambus, Inc.*, No. 9302, 2006 WL 2330117, at \*53 (F.T.C, Aug. 2, 2006), *rev'd*, 522 F.3d 456 (D.C. Cir. 2008); *Dell Computer Corp.*, 121 F.T.C. 616 (1996).

<sup>70</sup> Fairfield Resources Int'l, Review of Patents Declared as Essential to LTE and SAE (4G Wireless Standards) Through June 30, 2009 (2010), <http://www.frlicense.com/LTE%20Final%20Report.pdf>; Fairfield Resources Int'l, Analysis of Patents Declared as Essential to GSM as of June 6, 2007, at 7, [http://frlicense.com/GSM\\_FINAL.pdf](http://frlicense.com/GSM_FINAL.pdf); Fairfield Resources Int'l, Review of Patents Declared as Essential to WDCMA Through December, 2008, at 1 (2009) <http://www.frlicense.com/wcdma1.pdf>.

<sup>71</sup> *Innovatio* (all 19 asserted patents and \_\_\_ patent claims found to be essential after cursory analysis).

## 2. Blanket Disclosure and Unknown SEPs

A related but different problem arises in SDOs that do not require the identification of specific “essential patents”, but instead permit firms to issue so-called “blanket disclosures” indicating that they *may* control standards-essential patents, but without identifying particular patents.<sup>72</sup> In these SDOs, the total number of patents is entirely unknown and left to conjecture or, to the extent they exist, external studies.<sup>73</sup>

An example of the significant hurdles courts face when attempting to value patents covering standards without disclosure obligations appears in *Microsoft v. Motorola*. In that case, the court assessed the value of Motorola’s patents covering ITU’s H.264 audiovisual compression standard. In its analysis, the court considered only the 89 other H.264 SEPs that were expressly identified in letters of assurance submitted to the SDO, despite the court’s finding, based on expert testimony, that there more than 2,400 patents are essential to the H.264 standard and that many of the “core innovations” in this standard were patent-free contributions made by the Telenor Group.<sup>74</sup>

## 3. Evidentiary Burden on the Defendant

In the damages phase of a typical patent infringement case, including a case involving SEPs, the patentee has the burden of proving its damages. In doing so, it must establish the level of royalties to which it is entitled based on the apportionment methodologies discussed in Part I.C, above. In support of its case, as explained in *Microsoft v. Motorola*, the SEP holder

---

<sup>72</sup> According to Bekkers and Updegrave, of eight SDOs studied, four permit blanket disclosures. Bekkers & Updegrave, *supra* note 23, at 61. However, two of those (IETF and W3C) only permit such blanket disclosures if the patent holder commits to license its SEPs on a royalty-free basis. The other two (ITU and IEEE) permit blanket disclosures so long as a FRAND commitment is made. *Id.*

<sup>73</sup> For example, in *Innovatio* the court relied on a study by PA Consulting Group that estimated the number of essential patents covering the Wi-Fi standard by searching patent databases for “keywords related to the 802.11 standard” and conducting a “technical analysis” of a “portion” of the search results. *In re Innovatio*, ECF No. 975 at 83. The report expressly disclaimed having performed “a complete legal analysis” and said that its conclusion was only that the patents counted are “*potentially* essential.” *Id.*

<sup>74</sup> *Microsoft v. Motorola Findings*, *supra* note 56, at \*26 (“many of the core innovations of the H.264 Standard were made by Telenor Group, which did not obtain patents on the technology that it contributed and made its contributions available to all implementers of the standard without patent licensing restrictions”).

must demonstrate both the value of its patented technology to the relevant standard and the value of the standard to the overall product in which it is implemented.<sup>75</sup> It is natural that the SEP holder will seek to put forward its best case. It will demonstrate the value of its patented technology by introducing evidence not only of its technical merit and superiority to alternative technologies, but also of the time, effort and ingenuity that went into its development. In this setting, every patented technology can be made to appear revolutionary.

But what of the many other patented and unpatented technologies that are included in most technical standards? The value of the patentee's technology should be evaluated not in isolation, but in comparison to these other technological contributions to the standard. Yet, in a typical patent infringement action, the developers and owners of these other technologies are nowhere to be found. Rather, the burden is on the accused infringer to represent the hundreds or thousands of other patented and unpatented contributions to the standard to demonstrate the comparative value of the asserted SEPs. Mounting this type of defense is not only time-consuming and resource intensive, but may require expertise and background (e.g., engineers who participated in the relevant SDO) that are not know or available to the defendant. What's more, putting on evidence regarding the large body of unasserted technology in a typical patent infringement case would likely try the patience of both the judge and the jury, if sufficient time for such a presentation were even available.<sup>76</sup>

---

<sup>75</sup> See note 56, *supra*, and accompanying text (discussing methodology used in *Microsoft* case).

<sup>76</sup> See Seaman, *supra* note 36, at 1697-98 (citations and internal quotations omitted):

As a practical matter, at trial, juries hear extensive evidence from the patent holder regarding the critical importance of the patented invention but often receive little or no information regarding all the other things that contribute to the success of the accused product, such as other inventions and the contributions of defendants' own technology and marketing efforts. Indeed, it would be virtually impossible to explain the importance of all the other, noninfringing components and features contained in complex products like computer operating systems or smartphones --- such a presentation likely would take weeks or months of highly technical testimony, which few judges would allow (and few jurors would want to endure). As a result, juries often come away from a trial with an inflated sense of the relative value of [the patented] invention and consequently award a disproportionately high royalty.

In *Microsoft v. Motorola*, Microsoft, one of the world’s largest and wealthiest corporations, was able to introduce expert evidence refuting the SEP holder’s portrayed importance of its technical contributions to the standard.<sup>77</sup> However, Microsoft is the rare defendant in such cases, and many manufacturers of standards-compliant products and components are unlikely to have the resources, knowledge and expertise to represent the universe of other technologies contained in a complex technical standard.

### C. *Ad Hoc Analytical Methodologies: Ranking Patents*

Several district courts have sought to value FRAND-encumbered patents, each using different analytical methodologies. In each case, the court sought to compare each asserted patent family to a hypothetical “average” standard essential patent covering the standard. For instance, the *Microsoft* court’s findings of fact devoted over forty pages to a qualitative assessment of Motorola’s H.264 patents.<sup>78</sup> The court tried to determine whether each patent “provides” one or more “core innovative function[s]” of the standard.<sup>79</sup> It concluded that some patents would not have been highly valued in a hypothetical royalty negotiation because they cover “intuitive . . . minimal technical advancements” in view of the prior art.<sup>80</sup> Yet after undertaking this laborious exercise, the court’s qualitative analysis appears not to have factored directly in its ultimate FRAND rate calculation. The court merely relied on its overall conclusion that the patents as a whole were no more valuable than average as a reason to rely on existing patent pool rates to set FRAND royalties.

In contrast, the court in *Innovatio* found, just as in the fictitious Lake Wobegone,<sup>81</sup> that all of the asserted patents were of *above-average* value.<sup>82</sup> As a result, the court had to decide how much extra royalty the asserted patents deserved. In doing so, it used a single fifteen-year-old study based on 1970s-era data that attempted to calculate a value distribution for “all

<sup>77</sup> See *Microsoft v. Motorola Findings*, *supra* note 56, at x.

<sup>78</sup> *Microsoft v. Motorola Findings*, *supra* note 56, at x.

<sup>79</sup> *Microsoft Corp. v. Motorola, Inc.*, ECF No. 681 at 72.

<sup>80</sup> See, e.g., *id.* at 64.

<sup>81</sup> Garrison Keillor, *A Prairie Home Companion* (“Lake Wobegon, where all the women are strong, all the men are good looking, and all the children are above average.”)

<sup>82</sup> *In re Innovatio*, ECF No. 975 at 85. Notably, the court’s analysis involved some bootstrapping. It found the patents at issue were of above-average value in significant part because the court had evaluated them and found them to be essential. This aspect of the *Innovatio* analysis is arguably inconsistent with the typical hypothetical royalty negotiation construct in which patents are always presumed to be valid and infringed.

electronics patents.”<sup>83</sup> The study was unrelated to Wi-Fi or standards-essential patents. Moreover, the study actually concluded that value distributions vary substantially over time and among industries.<sup>84</sup> Nevertheless, the *Innovatio* court used the study to justify apportioning 84% of the value of the standard to “top ten percent” Wi-Fi patents.

Less is known about the methodologies used in the *Ericsson* and *Realtek* cases, as royalty calculations there were performed by juries operating under judicial instructions. One can assume that the methodologies used in these cases were far from consistent. The jury in *Realtek*, for example, was instructed to select a FRAND royalty taking into account the importance of the two patents-in-suit to the standard as determined by: “comparing the technical contribution of the two LSI patents to the technical contributions of other patents essential to the standard,” and then considering the contribution of the standard as a whole to the market value of Realtek’s products utilizing the standard.<sup>85</sup> It is unclear how the jury could have meaningfully compared the patents-in-suit to the contributions of all of the “other patents” essential to the standard given that no definitive list of such patents exists.

#### D. Advisory Opinions

The district court in Apple’s FRAND contract enforcement suit against Motorola dismissed the suit on the eve of trial.<sup>86</sup> It expressed two major concerns. First, it was concerned by Apple’s refusal to commit to pay whatever rate the court might set. It found that, “Apple had failed to show that its requested declaration would serve any purpose other than providing Apple a ceiling on the potential license rate that it could use for negotiating purposes.”<sup>87</sup> Second, it was concerned that none of the other provisions of the proposed license agreement that Apple was seeking to enforce had been negotiated yet. It reasoned that even if the court picked a royalty, “litigation

---

<sup>83</sup> See J. Gregory Sidak, *The Meaning of FRAND, Part I: Royalties*, 9 J. COMPETITION LAW & ECON. 1019, x (2013) (discussing *Innovatio* analysis). [include cite to original article]

<sup>84</sup> *Innovatio*

<sup>85</sup> See David Long, *Jury returns RAND-royalty rate of 0.19 percent of WiFi chip sale price (Realtek v. LSI)*, Essential Patent Blog, Feb. 27, 2014, available at <http://www.essentialpatentblog.com/2014/02/jury-returns-rand-royalty-rate-of-0-19-percent-of-wifi-chip-sale-price-realtek-v-lsi/> (reporting jury instructions).

<sup>86</sup> *Apple Inc. v. Motorola Mobility, Inc.*, 2012 U.S. Dist. LEXIS 168986, \*8 (W.D. Wis. Nov. 28, 2012).

<sup>87</sup> cite

likely would be necessary to resolve the parties' licensing and infringement disputes.”<sup>88</sup> The court in *Ericsson* similarly found that in the absence of an agreement to take a license at the court-adjudicated rate, any decision the court might render on the FRAND royalty rate would be an improper “advisory opinion.”<sup>89</sup>

A similar outcome occurred in *InterDigital v. Nokia*.<sup>90</sup> There the court dismissed counterclaims asking it to “find that InterDigital has not offered a FRAND rate to Nokia and for the Court to determine what FRAND license terms would be.”<sup>91</sup> The court dismissed the counterclaims as non-justiciable in part because Nokia had not submitted any sworn affidavit stating that it “would sign a license” consistent with the court’s declaration.<sup>92</sup>

These decisions indicate that busy trial courts have little patience with litigants who are likely to view their FRAND rate determinations as advisory only. We must therefore assume that courts will continue to limit FRAND rate-setting cases to circumstances in which their orders can end the parties’ disputes. Below we suggest a structure that would put the dispute in a posture more amenable to final resolution than did these cases.

#### *E. A Better Way: Top-Down Determination of Aggregate Royalties*

The bottom-up royalty approach described above results in serial royalty determinations by patent and patent holder, yielding aggregate royalty burdens that grow in an uncoordinated and inconsistent manner. A superior alternative is a top-down approach in which an aggregate royalty for all patents essential to a particular standard is determined and then allocated among the holders of such patents according to some rational apportionment methodology. Such top-down determinations avoid issues concerning excessive royalty charges due to individualized determinations, and also benefit from the involvement of all relevant patent holders in determining both the aggregate royalty amount and apportionment methodology.

---

<sup>88</sup> *Id.*

<sup>89</sup> *Ericsson Inc. v. D-Link Sys.*, 2013 U.S. Dist. LEXIS 110585, \*75 (E.D. Tex. Aug. 6, 2013).

<sup>90</sup> *InterDigital v. Nokia*, No. 13-CV-00009 RGA, ECF No. 230 at 6 (D. Del. May. 28, 2014).

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

Top-down royalty determinations have traditionally been utilized by patent pools and other collective rights organizations. There, participating firms collectively agree on the price to be charged for their collective assets, as well as the formula pursuant to which the proceeds from licensing these assets will be divided amongst them.<sup>93</sup> Agreements regarding aggregate patent royalties have also been made in less structured settings involving industry standards developed outside of patent pools.<sup>94</sup>

In addition, a handful of courts around the world have begun to consider top-down approaches to assessing royalty determinations for standardized products. The U.S. District Court for the Northern District of Illinois took a step in this direction in *Innovatio*, in which it held that the aggregate per-product royalty attributable to the Wi-Fi standard should be \$1.80, and then apportioned a portion of this aggregate to the plaintiff.<sup>95</sup> As noted by the trial judge, a “Top Down approach best approximates the RAND rate that the parties to a hypothetical *ex ante* negotiation most likely would have agreed upon...”<sup>96</sup>

Likewise, in *Samsung v. Apple Japan*, the Japanese Intellectual Property High Court affirmed the Tokyo High Court’s determination that the aggregate royalty burden for the 3G UMTS standard should not exceed five percent.<sup>97</sup> It reached this conclusion based, among other things, on prevailing industry support for a 5% royalty cap for the standard.<sup>98</sup> It then allocated a portion of this royalty to Samsung’s asserted UMTS-essential

---

<sup>93</sup> See, e.g., Merges (1996) at 1392, Gilbert (2010), Mattioli (2014), Merges and Mattioli (2016).

<sup>94</sup> See Jorge L. Contreras, *Patent Pledges*, 47 Ariz. St. L.J. 543, 559-61 and Table 4 (2015) (describing maximum royalty commitments made with respect to wireless telecommunications standards). See also Contreras, *Fixing FRAND*, *supra* note 27, at 78-80 (proposing standard-based aggregate royalty agreements).

<sup>95</sup> *In re Innovatio IP Ventures, LLC*, 2013 U.S. Dist. LEXIS 144061, \*183 (N.D. Ill. Sept. 27, 2013). But see Part x, *infra*, critiquing the court’s specific apportionment analysis.

<sup>96</sup> *Innovatio*, 2013 U.S. Dist. LEXIS at \*163. See also Thomas F. Cotter, *Patent Damages Heuristics*, \_\_ TEX. INTELL. PROP. L.J. \_\_, ms pp. 43-44 (forthcoming 2017) (discussing *Innovatio* top-down analysis).

<sup>97</sup> *Apple Japan Godo Kaisha v. Samsung Electronics Co.*, IP High Court of Japan (May 16, 2014). See generally Yuzuki Nagakoshi & Katsuya Tamai, *Japan without FRANDs? Recent Developments on Injunctions and FRAND-Encumbered Patents in Japan*, 44 AIPLA Q.J. 1 (2016).

<sup>98</sup> See Miyuki Hanai, *Judgment of IP High Court on Apple v. Samsung*, AIPPI e-News, Dec. 2014, [https://www.aippi.org/enews/2014/edition39/Miyuki\\_Hanai.html](https://www.aippi.org/enews/2014/edition39/Miyuki_Hanai.html)

patent.

There are numerous ways that aggregate royalty rates can be determined and apportioned among rights holders, and there is a large economics and finance literature in this area.<sup>99</sup> Methodologies may differ as between the determination of aggregate royalties for a particular standard, and the contributions to the standard of individual patented technologies. For example, market surveys and associated conjoint analysis may be useful in gauging the value that a standard such as Wi-Fi, USB or Bluetooth contributes to a product such as a smart phone or a laptop computer.<sup>100</sup> However, determining the contribution to a complex standard of a particular patented technology, which may have little visibility to the user, would likely require different methods. Individual patents and groups of patents have been valued using methods such as citation count,<sup>101</sup> cost recovery,<sup>102</sup> real option value,<sup>103</sup> substitute costs,<sup>104</sup> footprint methodology,<sup>105</sup>

---

<sup>99</sup> See, e.g., Cotter, *Heuristics*, *supra* note 96, at \*44-47 (analyzing various methodologies adopted in recent SEP cases); David O. Taylor, *Using Reasonable Royalties to Value Patented Technology*, 49 *Geo. L. Rev.* 79, 131-39 (2014); Patrick H. Sullivan, *Standardising IP Valuations: Whether, What and How*, INTELL. ASSET MANAGEMENT, Mar-Apr. 2009, at 30 (noting that over 50 different methods for valuing IP are currently in use), <http://www.iam-media.com/Magazine/Issue/34/Cover-story/Standardising-IP-valuations-whether-what-and-how>, RICHARD RAZGAITIS, VALUATION AND PRICING OF TECHNOLOGY-BASED INTELLECTUAL PROPERTY 41-54 (2003), Robert Pitkethly, *The Valuation of Patents: A Review of Patent Valuation Methods with Consideration of Option Based Methods and the Potential for Further Research*, Judge Inst. Working Paper WP 21/97 (1997), <http://users.ox.ac.uk/~mast0140/EJWP0599.pdf>. For a general and now classic discussion of the theory behind the allocation of resources among interested parties, see H. PEYTON YOUNG, *EQUITY IN THEORY AND PRACTICE* (1994).

<sup>100</sup> See, e.g., Patricia Dyck, *Beyond Confusion—Survey Evidence of Consumer Demand and the Entire Market Value Rule*, 4 *HASTINGS SCI. & TECH. L.J.* 209, 237 (2012), Christopher K. Larus & Bryan J. Mechell, *Using Consumer Surveys to Prove Patent Infringement Damages at Trial*, 18 *INTELL. PROP. STRATEGIST*, Dec. 2011.

<sup>101</sup> See Alan Cox, *Using Citation Analysis to Value Patents*, *Financier Worldwide*, Jan. 2016, <http://www.financierworldwide.com/using-citation-analysis-to-value-patents/#.V3mfcFfDT-Q>

<sup>102</sup> See, e.g., Ted Sichelman, *Purging Patent Law of “Private Law” Remedies*, 92 *TEX. L. REV.* 517, 541, 567 (2014); Damien Geradin & Anne Layne-Farrar, *Patent Value Apportionment Rules for Complex, Multi-Patent Products*, 27 *SANTA CLARA COMP. & HIGH TECH. L.J.* 763, 781-83 (2011); Mark A. Lemley, *Property, Intellectual Property, and Free Riding*, 83 *TEX. L. REV.* 1031, 1059 (2005).

<sup>103</sup> See J. Gregory Sidak, *Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro*, 92 *MINN. L. REV.* 714, 736-43 (2008).

<sup>104</sup> See Seaman, *supra* note 36, at 1672-73.

discounted cash flow,<sup>106</sup> and comparable license analysis.<sup>107</sup> In some cases, when multiple patents cover a single standard or product, parties may divide aggregate revenues amongst themselves pro rata, based on nothing more than a simple patent “head count” (sometimes referred to as numerical proportionality).<sup>108</sup>

It is beyond the scope of this article to recommend a particular methodology for determining aggregate royalty rates and for allocating royalties among patent holders. It is likely that the circumstances surrounding the development of different standards, the participants in the relevant SDO, the number of patents involved and the norms and practices in the relevant industry will each play a role in the selection of an appropriate valuation methodology. Suffice it to say that we believe that any of a number of recognized top-down methodologies for determining aggregate royalty rates and apportionment among patent holders, if performed rigorously with access to relevant information, would yield more accurate, fair and reasonable aggregate and individual royalty rates for FRAND-encumbered SEPs than the bottom-up approaches discussed above.

### III. USING INTERPLEADER TO IMPLEMENT A TOP-DOWN APPROACH TO FRAND ROYALTY DETERMINATIONS

For over six hundred years, the common law has provided a party under a single obligation a mechanism to protect itself from “multiple vexation” by “adverse claimants” to the obligation: interpleader.<sup>109</sup> The modern embodiment of that form of action in the United States is set forth in the

---

<sup>105</sup> Aaron Fahrenkrog, *A New ‘Footprint’ Paradigm for Reasonable Royalty Damages*, Law360 (March 11, 2015).

<sup>106</sup> See Geradin & Layne-Farrar, *supra* note 102, at 784.

<sup>107</sup> See Jonathan S. Masur, *The Use and Abuse of Patent Licenses*, 110 Nw. U. L. Rev. 115 (2015); Geradin & Layne-Farrar, *supra* note 102, at 783.

<sup>108</sup> See Menno Treffers, *The Royalty Rate for a Subset of Standard Essential Patents – What is Reasonable?* IPWatchdog, May 22, 2016, <http://www.ipwatchdog.com/2016/05/22/royalty-rate-standard-essential-patents/id=69045/> But see Geradin & Layne-Farrar, *supra* note 102, at 779-80 (critiquing this methodology).

<sup>109</sup> Chafee, Jr., *Modernizing Interpleader*, 30 YALE L.J. 814 (1921); Dobbs, Dan B. (1993); DOBBS LAW OF REMEDIES, Vol. 1 at 236 *et seq.* (2nd ed., West Publ.)

federal interpleader statutes.<sup>110</sup> These statutes give district courts original jurisdiction over civil actions in the nature of interpleader filed by anyone who is under “any obligation written or unwritten to the amount of \$500 or more,” if “two or more adverse claimants, of diverse citizenship . . . are claiming or may claim to be entitled to . . . benefits arising by virtue of such obligation” and the plaintiff deposits a “bond payable to the clerk of the court in such amount . . . as the court or judge may deem proper . . .”<sup>111</sup> The action is proper even if the conflicting claims do not have a “common origin,” and are not “identical” but are “adverse to and independent of one another.”<sup>112</sup>

Though it has not yet been employed in the context of standards-essential patents, federal statutory interpleader offers an attractive procedural mechanism for gathering all holders of FRAND-encumbered patents that are essential to a particular technology standard into a single action, and then determining (a) the aggregate royalty payable with respect to the SEPs covering that standard, and (b) the allocation of that aggregate royalty among individual SEP holders.

In this Part, we discuss the history of and procedural requirements for the interpleader action, and then discuss why interpleader is an ideal procedural mechanism for determining FRAND royalties in a top-down manner.

### *A. History of Statutory Interpleader*

Though modern practitioners may view it as obscure, interpleader has a long, rich heritage. The earliest interpleader-like proceedings described in the literature date from England in the early 1300’s and relate primarily to custodial rights over orphans.<sup>113</sup> That is, if a child lost his or her parents and fell into the custody of one who did not have a custodial claim, what was the temporary custodian to do when others appeared with competing claims over the child? And what result would follow if competing claimants, in separate proceedings, each won custody of the child? The custodian could not, after all, split the baby. To avoid these difficulties, courts were authorized to order the adverse claimants to “interplead” so that

---

<sup>110</sup> 28 U.S.C. §§ 1335, 1397, 2361.

<sup>111</sup> 28 U.S.C. § 1335.

<sup>112</sup> *Id.*

<sup>113</sup> Ralph V. Rogers, *Historical Origins of Interpleader*, 51 *YALE L.J.* 924, 825 (1941).

all competing claims could be resolved in a single proceeding.<sup>114</sup>

From the 1400's at least, a bailee of a thing or instrument of value (*e.g.* a deed) could resolve competing claims to it through interpleader.<sup>115</sup> The underlying theory, as the English Court of Common Pleas expressed it in the 1424 case of *Rafe Cromwel v. Edmund Moris*, is that adverse claimants should be compelled to interplead:

for otherwise the defendant would be in great mischief for if he were to answer to one and to the other severally, then if it were found against the defendant and for the plaintiff in each case, each of them would have judgment to recover the writing, and so he would be twice charged for the same thing which would be contrary to reason . . . .”<sup>116</sup>

Interpleader relief was available both when the adverse claimants had sued the bailee (“compulsory interpleader”), and when the bailee was merely concerned that they might bring suit (“interpleader by way of garnishment”).<sup>117</sup> In the latter case, service upon absent claimants and potential claimants was effected by the sheriff delivering a “writ of *scire facias*” (to “make known”).<sup>118</sup> If a claimant warned by *scire facias* failed to appear to interplead, a default judgment could be entered against him.<sup>119</sup>

In the early twentieth century, interpleader had become an important but limited form of action in the United States. It was available in federal courts under their general equity powers and under a series of Interpleader Acts enacted beginning in 1917.<sup>120</sup> Interpleader relief was perhaps most commonly used to resolve adverse claims to insurance proceeds and bank

---

<sup>114</sup> *Id.* 926.

<sup>115</sup> *Id.* 946. The common fact pattern was this: A contracts with B to perform some service. To secure his performance, A deposits an instrument of value, such as a deed to property, with third party C. If B performs but A does not pay, C is to convey the deed to B. If B fails to perform, C is to return the deed to A. If A and B dispute whether B performed and C does not know who is right, C deposits the instrument in court and is discharged of his responsibility.

<sup>116</sup> *Id.* 946.

<sup>117</sup> *Id.* at 934.

<sup>118</sup> *Id.* at 936.

<sup>119</sup> *Id.* at 937; Federal Rule 81(b) abolishes the writ of *scire facias* but states that the “same relief” is still available “by appropriate action” or motion.

<sup>120</sup> Zechariah Chafee, Jr., *Interpleader in the United States Courts*, 41 YALE L.J. 1134 (1931).

accounts.<sup>121</sup> The Interpleader Acts were available only to specific classes of stakeholders such as insurance companies and fraternal benefit societies.<sup>122</sup> Judicially-created doctrines further limited the availability of interpleader. These included requirements that all claimants claim the “same thing, debt or duty”, that the adverse claims be “derived from a common source,” and that the stake holder had to have no “independent liability” to the claimants and stand “perfectly indifferent between them.”<sup>123</sup>

In 1921, Harvard Law Professor Zechariah Chafee published an influential article in the *Yale Law Journal* entitled “Modernizing Interpleader.”<sup>124</sup> Professor Chafee argued that these restrictions had come to “hem in” the “admirable remedy” of Interpleader and were neither necessary nor consistent with the historical origins of the doctrine.<sup>125</sup> He argued that the only true requirements of interpleader are “reasonable apprehension of double vexation, absence of collusion [between the stakeholder and any claimant], and deposit of the *res* in court.”<sup>126</sup>

Fifteen years later, Professor Chafee’s liberal view of interpleader was implemented in the Federal Interpleader Act of 1936 (the “1936 Act”). The 1936 Act allowed “any person, firm, [or] corporation” to bring an action in interpleader.<sup>127</sup> It extended interpleader subject-matter to “any obligation written or unwritten to the amount of \$500 or more.” It also provided that the claims need not have a common origin, or be identical so long as they are “adverse to and independent of one another.”<sup>128</sup>

The statute was further amended and simplified in 1948, putting it in essentially the same form as we find it today.<sup>129</sup> The 1948 amendments made clear that interpleader applies whenever two or more adverse claimants are claiming “or may claim” to be entitled to any one or more of the benefits arising by virtue of the obligation.<sup>130</sup> These statutes were

---

<sup>121</sup> *Id.* at 1134, 1139.

<sup>122</sup> *Id.* at 1161.

<sup>123</sup> Zechariah Chafee, Jr., *Modernizing Interpleader*, 30 YALE L.J. 814 (1921).

<sup>124</sup> *Id.*

<sup>125</sup> *Id.* at 821.

<sup>126</sup> *Id.*

<sup>127</sup> Zechariah Chafee, Jr., *The Federal Interpleader Act of 1936: I*, 45 YALE L.J. 963, 968 n.26 (1936).

<sup>128</sup> *Id.*

<sup>129</sup> 28 U.S.C. § 1335.

<sup>130</sup> 28 U.S.C. § 1335(a)(1).

expressly intended to implement interpleader broadly and the Supreme Court has said they should be “liberally construed.”<sup>131</sup> Only a “minimal threshold level of substantiality” is required to demonstrate that adverse potential claims exist.<sup>132</sup>

The 1948 Act also liberalized the deposit requirement. Traditionally, interpleader required that the *res* in dispute be deposited with the clerk of the court to facilitate immediate distribution to the prevailing claimant or claimants upon entry of judgment. When interpleader jurisdiction was expanded to cover “any obligation,” drafters recognized that it would not always be practical, or even possible, for the stakeholder to deposit the disputed *res*.<sup>133</sup> Accordingly, the Act provided that in lieu of actual deposit, the stakeholder may submit a “bond payable to the clerk of the court in such amount and with such surety as the court or judge may deem proper . . . .”<sup>134</sup> While the deposit requirement is expressed as a condition of jurisdiction, in modern practice it is sometimes ignored when the stakeholder pleads its willingness to deposit a bond.<sup>135</sup>

#### *B. Applying Interpleader to FRAND Royalty Determinations*

Interpleader, as it is currently adopted in the federal interpleader statutes, has unique procedural features that make it attractive for litigating apportionment of an aggregate FRAND royalty. These include:

- **Low bar for case-in-controversy:** jurisdiction extends to any entity which claims or “may claim” a share of the obligation provided only that such claims have a “minimal level of substantiality”;
- **Minimal diversity:** federal diversity jurisdiction exists whenever at least two claimants are diverse and the presence of

---

<sup>131</sup> *State Farm Fire & Casualty Co. v. Tashire*, 386 U.S. 523, 533 (1967)

<sup>132</sup> *Michelman v. Lincoln Nat'l Life Ins. Co.*, 685 F.3d 887, 895 (9th Cir. 2012) (interpleader proper when potential adverse claimant was reasonably believed to have a “colorable” claim to insurance proceeds; insurance company need not assess the merits of the potential claim).

<sup>133</sup> See Chafee [FIA of 1936], *supra* n. x at 977.

<sup>134</sup> 28 U.S.C. 1335(a)(1).

<sup>135</sup> See Cathy Hwang and Benjamin P. Edwards, *The Value of Uncertainty*, Nw. U. L. Rev. Colloquy (2015), [http://scholarlycommons.law.northwestern.edu/nulr\\_online/228](http://scholarlycommons.law.northwestern.edu/nulr_online/228) (noting absence of practice of depositing *res* or bond in litigation among “sophisticated financial parties” involving “securitized financial instruments.”)

- non-diverse claimants does not destroy it;
- **Ease of service:** nationwide service of process is authorized;
  - **Breadth of consolidation:** the court has statutory power to enjoin all claimants from “instituting or prosecuting any proceeding” in the United States affecting the obligation; and
  - **Finality:** once the obligation has been apportioned, the court may make the injunction permanent and discharge the interpleader plaintiff from further liability.

These unique features make interpleader a powerful procedural mechanism for obtaining jurisdiction over a large and diverse group of claimants and resolving their claims to a particular obligation in a single consolidated proceeding. This mechanism addresses the shortcomings of piecemeal litigation that FRAND cases embody today and allows the efficient and speedy resolution of factually-intensive questions that might otherwise require the expenditure of significant public and private resources in multiple duplicative actions.

There are two primary requirements for applying interpleader to disputes over FRAND royalties. First, it must be established that the aggregate patent royalty applicable to a standard may be viewed as a single payment “obligation” of the interpleader petitioner (i.e., the manufacturer of a standardized product or component). Second, the amount in controversy must be paid out of a single fund that is subject to two or more adverse claims.

### 1. Single Obligation

Outside the standards context, every patent represents a discrete, independent potential claim for royalties. If each royalty claim is discrete and independent, then the manufacturer of a product that infringes multiple patents is not “multiply vexed” by such claims even if they relate to the same product. A smartphone manufacturer may choose to implement different patented technologies to provide, for instance, a more advanced camera, longer-lived battery, or tougher screen. Each such choice is independent of the others. If the manufacturer implements all three, the patent holders’ royalty claims may “compete” in an economic sense for a share of the manufacturer’s product revenue, but they are not in a legal sense seeking to recover royalties for the “same” technology.

Standards essential patents, however, present a special case. Once a manufacturer decides to implement a particular standard in its product, it must take the entire standard, with all associated patents. Apart from any “optional” features, the product manufacturer cannot choose which patented features of the standard to include or exclude.<sup>136</sup> The mandatory features of the standard and their associated patents, even if there are thousands of them, constitute a single aggregate that the manufacturer must take to manufacture a standardized product.

SEP holders bound by FRAND commitments cannot charge unlimited royalties on standardized technologies. There is broad consensus among courts, agencies and commentators that FRAND commitments require royalty rates on individual standard essential patents to be set in such a manner that the *aggregate* royalty on the standard as a whole is reasonable and consistent with widespread implementation of the standard.<sup>137</sup> Even the Federal Circuit, which has expressed some skepticism about the uniqueness of SEPs, acknowledges that SEP royalties can become “excessive in the aggregate” and that this should be taken into account when setting individual patent royalties.<sup>138</sup> As noted above, some courts have gone further to set a theoretical maximum royalty rate for the standard as a whole.<sup>139</sup> In *Innovatio*, for instance, the aggregate royalty was set at \$1.80 per unit, and *Innovatio*’s portion of that aggregate was set at \$0.0956.<sup>140</sup> Thus, for every standard, there is a single royalty pie to be

---

<sup>136</sup> Many standards include both mandatory and optional features. Mandatory features must be included in the product in order for it to be deemed compliant with the standard and thereby to be entitled to licenses from holders of SEPs. *See* ABA Patent Policy Manual, *supra* note x, at x. For the sake of simplicity, we will refer throughout this article to mandatory portions only.

<sup>137</sup> *See* Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 2015-16, 2026-28 (2007); Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting*, in Jaffe et al., INNOVATION POLICY AND THE ECONOMY (2001) at 6-8; <sup>137</sup> *Microsoft Corp. v. Motorola, Inc.*, 2013 U.S. Dist. LEXIS 60233 at \*42 (W.D. Wash., Apr. 25, 2013), *aff’d* 795 F.3d 1024 (9th Cir. 2015); Letter from The Hon. Renata B. Hesse, Acting Assistant Att’y Gen, U.S. Dep’t of Justice to Michael A. Lindsay, Esq. (Feb. 2, 2015) *available at* <https://www.justice.gov/atr/response-institute-electrical-and-electronics-engineers-incorporated> (“[A]ppropriately apportioning the value of all essential patent claims in an IEEE standard addresses royalty stacking, which may hamper implementation of a standard.”)

<sup>138</sup> *See* discussion of *Ericsson, Inc. v. D-Link Sys* at Part x, *supra*.

<sup>139</sup> *See* notes x, *supra*, and accompanying text. [discussing *Innovatio* and Japanese *Apple v. Samsung*]

<sup>140</sup> *In re Innovatio IP Ventures, LLC*, 2013 U.S. Dist. LEXIS 144061, \*183 (N.D. Ill. Sept. 27, 2013).

divided among SEP holders. Parties may vehemently dispute the size of the pie and their shares of it, but there seems to be no dispute that a single pie exists. Hence, the reasonable aggregate royalty represents a single obligation to which all SEP owners are claimants. Moreover, all SEP owners have signed on to a contract to take no more than a FRAND share of that aggregate. That contract can also be seen as a single obligation supporting interpleader jurisdiction.

## 2. Adverse Claims

The case for applying interpleader to FRAND royalty disputes also depends on establishing the potential for overlapping, adverse claims to the relevant funds. This bar is not a high one. As discussed above, interpleader jurisdiction extends to any situation in which there is the potential for adverse claims having a “minimal threshold of substantiality.”<sup>141</sup> Only a good faith fear of adverse claims is required, regardless of the actual merits of the claims or the stakeholder’s subjective belief.<sup>142</sup>

In standards litigation, the potential for individual claims to exceed a reasonable aggregate royalty, or royalty stacking, has been widely acknowledged.<sup>143</sup> If royalties can stack, then the royalties one patent holder charges necessarily impact the royalties that other patent owners can charge. Every slice taken leaves less pie for the others. The example of the royalty rates assessed in the five Wi-Fi suits summarized in Table 2 exemplifies this problem. Even for the thirty-five patents asserted in those suits, the aggregate royalty, based on the five courts’ calculations, would exceed some of their maximum aggregate royalties for the standard. And this does not even consider the remainder of the 3,000 patents covering the standard.

Stacking concerns aside, the “apportionment” analysis also illustrates why competing claims to royalties on the same standard are adverse to one another and in need of consolidated resolution.<sup>144</sup> The apportionment analysis that courts must perform in every SEP case is a valuation of a certain set of patents *relative to* all of the other patents covering the

---

<sup>141</sup> See note x, *supra*; 7 C. Wright & Kane, Federal Practice and Procedure, § 1704.

<sup>142</sup> Moore’s Federal Practice - Civil 22.02 (3d ed., 1997-date).

<sup>143</sup> Ericsson. See part x, *supra*.

<sup>144</sup> Such consolidation is consistent with similar techniques in other areas of the law. For example, under federal bankruptcy law, multiple creditors are placed together in a single action in order to resolve all claims to the debtor’s estate in a consolidated fashion. [cite]

standard.<sup>145</sup> When a trier of fact concludes that a given set of patents contributed important technologies to the standard and are therefore entitled to a greater-than-average share of royalties,<sup>146</sup> that decision is adverse to the claims of every other SEP owner whose share of the overall pie is thereby reduced.

The *Innovatio* case presents a particularly clear example of this effect. As discussed above, the Court adopted a valuation methodology the court employed proceeded from the assumption that 84% of the royalties should be awarded to the top 10% most valuable patents.<sup>147</sup> The court determined that the patents-in-suit were among the “top 10%” and therefore awarded the patent holder a higher royalty than would have been attributed patents in the bottom 90%. Can there be any doubt that the decision to rank *Innovatio*’s 19 patents among the top 10% was “adverse” to the interests of the owners of all the other patents that cover the standard?<sup>148</sup>

Ranking patents based on their importance to a standard also presents risks to the infringing manufacturer. If different finders of fact in different proceedings each rank different patents in the “top 10%”, then a manufacturer is faced with the threat of paying more than 100% of the reasonable aggregate royalty. Again, this results from the inherent flaws in performing royalty calculations for SEPs in a bottom-up manner.

The *Realtek* and *CSIRO* cases offer a telling example of how this could happen. In *Realtek*, the patent owner claimed its patented technology minimized performance degradation due to “multipath signal transmission” in the Wi-Fi standard.<sup>149</sup> In setting the royalty, the jury was instructed to

---

<sup>145</sup> See Part I.C, *supra* (discussing apportionment analysis for patent damages).

<sup>146</sup> See notes 81-84, *supra*, and accompanying text (discussing flaws in patent ranking analysis).

<sup>147</sup> *Id.* at \*181; As discussed at note 83, *supra*, and accompanying text, this analysis was based on a fifteen-year-old study attempting to calculate a value distribution for “all electronics patents.”

<sup>148</sup> This decision is not adverse to the other owners in the sense that they are bound by it as a matter of collateral estoppel, but that is not what “adverse” means in the interpleader context. Indeed, it is *precisely because* the absent claimant would not be bound that Interpleader is necessary and appropriate. Interpleader protects the stake holder from inconsistent judgments that may arise when each claim is separately litigated.

<sup>149</sup> See Eric Schweibenz, *LSI Files New 337 Complaint Regarding Certain Audiovisual Components*, ITC Blog, Mar. 12, 2012, available at <http://www.itcblog.com/lsi-files-new-337-complaint-regarding-certain-audiovisual-components> (summarizing LSI ITC complaint asserting ’985 patent, which LSI characterized as relating to “digital modulation

“compare[] the technical contribution” of the patent “to the technical contributions of other patents essential to the standard.”<sup>150</sup> Five months later, in the Eastern District of Texas, the *CSIRO* case was decided. The court there awarded considerably higher royalties than were awarded in *Realtek* for a single patent that the court found “solve[d] challenges to indoor wireless networking known as the ‘multipath problem’ in wireless communications.”<sup>151</sup> When the jury in *Realtek* was considering the contribution of LSI’s patented Wi-Fi multipath technology to the standard, did it have in mind *CSIRO*’s Wi-Fi multipath technology? Of course it did not. These determinations were conducted independently without reference to one another. And given that patentees are represented in each of these cases by able counsel who will assert the importance of their client’s technical contribution, it would not be surprising for many more patented technologies to be found to be the “most important” contributors to solving the multipath problem in the Wi-Fi standard.<sup>152</sup>

Finally, while it is clear in the standards context that potential adverse claimants may exist, their identity is often unknown. As discussed above, some SDOs allow blanket FRAND commitments to be made, in which patent holders declare that they hold SEPs, but are not required to identify them.<sup>153</sup> Other SDOs require identification of specific patents and patent applications that cover the standard, but over-disclosure is common.<sup>154</sup> Thus, there may be no definitive list of patents that are actually essential to a standard. Another issue that has emerged recently in the area of SEP litigation is the frequent transfer of SEPs to patent assertion entities.<sup>155</sup> These entities are often created for the purpose of “disaggregating” a portfolio, thereby multiplying opportunities for royalty-extraction.<sup>156</sup> Even

---

and demodulation methods and/or systems that provide increased data rates while minimizing performance degradation due to such factors as multipath signal transmission and noise interference”).

<sup>150</sup> See Long, *supra* note x.

<sup>151</sup> *CSIRO v. Cisco*, 2014 U.S. Dist. LEXIS 107612 at \*4.

<sup>152</sup> See Part II.B.3, *supra* (discussing plaintiff’s presentation of favorable evidence and lack of contravening evidence from other SEP holders).

<sup>153</sup> See note x, *supra*

<sup>154</sup> See note x, *supra* [Fairfield studies]

<sup>155</sup> Jorge L. Contreras, *When a Stranger Calls - Standards Outsiders and Unencumbered Patents*, *J. COMP. L. & ECON.* \_\_ (2017 forthcoming) (finding that 77% of U.S. SEP assertions between 2010 and 2015 were brought by non-practicing entities).

<sup>156</sup> Mark A. Lemley & A. Douglas Melamed, *Missing the Forest for the Trolls*, 113 COLUMBIA L. REV. 2117 (2013) (arguing that many of the problems associated with so-called “trolls” are in fact “problems that stem from the disaggregation of complementary

when the list of declared essential patents is known, such transfers can impede potential licensees' ability to discover who owns the patents in each portfolio, and to whom royalties may be owed.

For all of these reasons, there is currently no reliable method by which a product manufacturer can determine all potential SEP royalty claimants. An important advantage of interpleader is that it has the potential to bring all claimants and potential claimants out of the shadows and into a single proceeding.

### 3. Leveling the Playing Field

The problem for implementers is not that SEP royalties are high *per se*, but that they are unpredictable and inconsistently apportioned. Ad hoc SEP assertions create a substantial risk that certain implementers will bear higher royalty burdens than their competitors for any number of reasons ranging from historical accident to poor bargaining strategy. Sometimes early licensees are favored over later licensees when licensors offer more favorable terms to the first licensees to acquiesce to their royalty demands. Sometimes later market entrants are able to structure their businesses to minimize royalty exposure. Some licensees benefit from the protection of foreign antitrust regimes and some do not. Some licensees are amenable to suit in fora where jurors have historically awarded high royalty rates to patent owners, and some are not. Some licensees have substantial existing investments in patent-implementing products and some do not. All of these are potentially factors in bilateral license negotiations (implicitly, at least) yet there appears to be no valid economic rationale for them. Any impact they may have on pricing are artifacts of the widely varied and often inconsistent legal regimes that touch SEPs.

Interpleader-based royalty determinations may also more efficiently reward investments in standards development made by large standard implementers. Currently, it is risky for SEP owners to assert their patents when they are also large producers of standardized products, as their own products may be vulnerable to a counter-suit by an accused infringer. As a result, the lion's share of SEP royalties tends to flow to SEP owners that enjoy a lower risk of counter-suit by nature of their business structure. An argument could be made that standardization substantially eliminates the

---

patents (patents that cover technologies used together in the same products) into too many different hands”).

incentive for large manufacturers to invest in standards development. Any innovations that are made part of the standard are made available to all competitors and therefore cannot be used to differentiate their products. Any patents they obtain can be expected to generate below-average royalties because they are in a relatively weak bargaining position compared to SEP owners that primarily or exclusively derive their revenue from patent licensing. In an interpleader context, by contrast, it is reasonable to expect that royalties will be allocated based only on the intrinsic value of the patented technologies. Whether the SEP owner is also a standard implementer should not be a factor in apportioning royalties.

#### 4. Privity

Before the Interpleader Act of 1936 was enacted, courts generally required that all the adverse claims in interpleader actions be “dependent, or be derived from a common source.”<sup>157</sup> The 1936 Act eliminated this “privity” requirement, stating that an action for interpleader could be maintained even though “claimants do not have a common origin, or are not identical, but are adverse to and independent of one another.”<sup>158</sup> Nevertheless, given the historical origins of the interpleader action, courts may perceive interpleader actions to be more appropriate in cases when the adverse claimants have some meaningful relationship that pertains to the claim in dispute. There are good reasons to assert that such privity arises from the way SDOs work.

FRAND licensing obligations apply only to those SEPs that are subject to FRAND declarations. Patent owners submit FRAND declarations as a *quid pro quo* for participating in the standardization process and having their patented technologies considered for inclusion in the standard. Technical proposals are vetted by committees and plenary sessions are held in which the participants’ representatives cast the votes that determine which will be included.<sup>159</sup> Indeed, representatives sometimes engage in “horse trading” with other participants to get their preferred technologies into the standard.<sup>160</sup> In these ways, SDO participants create a unitary body of technology that incorporates only those patents the participants have

---

<sup>157</sup> Chafee [Modernizing Interpleader] *supra* note x at 822.

<sup>158</sup> Chaffee [1936 Act], *supra* note x at 968.

<sup>159</sup> See, e.g., IEEE Standards Board Bylaws, available at <http://standards.ieee.org/develop/policies/bylaws/sect1-3.html#1>

<sup>160</sup> See Maurits Dolmans, *Standards for Standards*, 26 FORDHAM INTL. L. J. 163, 178 (2002).

selected together through the voting processes of their bylaws. The presence of a patented technology in a standard is therefore not attributable to any individual patentee alone, but to all the standards body participants who jointly approved the patentee’s technology for inclusion in the standard. Given all of that, it seems particularly equitable that the standards participants should be required to come together again in court to litigate their entitlement to royalties arising from the standardization process.<sup>161</sup>

Thus, equity also supports placing the burden of litigating royalty apportionment upon the parties having the incentive and superior knowledge to litigate the issue: the SEP holders themselves. The mechanics of the process we envision is described in the next Part.

### *C. Interpleader Mechanics*

#### 1. Initiating Suit

The interpleader statute confers original jurisdiction over actions filed by any person, firm or corporation that is under “any obligation written or unwritten” in excess of the jurisdictional amount if there are two or more claimants of diverse citizenship and the plaintiff has posted bond. Once a product manufacturer has begun to implement a standard without a license under all relevant FRAND-encumbered SEPs, the manufacturer has an “obligation” to pay royalties to all SEPs holders. An interpleader action could be brought by the manufacturer to quiet these competing claims to its obligation to pay a fixed aggregate royalty for implementing the standard. In practice, however, it is more likely that such a suit would be brought in response to a patent holder’s suit for infringement in which royalties are sought. Such an action may be brought “in any judicial district in which one or more of the claimants reside.”<sup>162</sup>

The interpleader action also offers a component supplier that is not directly threatened by an infringement suit the ability to adjudicate all competing royalty claims with respect to its standard-implementing

---

<sup>161</sup> Of course, some FRAND-encumbered patents are sold or transferred to entities that did not participate in the standardization process. *Contreras, Stranger, supra* note x, at x. Even in that case, however, the transferees stand in the stead of the transferors and are equitably subject to all of the same obligations.

<sup>162</sup> 28 U.S.C. § 1397.

component for the benefit of its customers. This possibility is increasingly relevant when standards are used in complex, multi-function products such as smartphones that include many feature-rich components. A SEP holder will often bring suit not against the manufacturer of the chip or component that actually implements a standardized technology, but against the manufacturer of a larger product that utilizes that chip or component or, in cases such as *Innovatio*, against owners of retail businesses (coffee shops, motels) that use such products in their operations.<sup>163</sup> In each of these cases, the component manufacturer undoubtedly has an interest in determining the aggregate FRAND royalty burdening its standards-compliant component. However, if the SEP holder does not sue the component manufacturer directly,<sup>164</sup> then the component manufacturer has little opportunity to intervene in the suit and present what is probably the most relevant evidence regarding the operation and development of its standard-compliant component. The interpleader action offers a component manufacturer the opportunity to initiate an original action to interplead the royalty rather than merely seek to intervene in such a suit after the fact.

## 2. Depositing a Bond

Interpleader actions generally begin with the initiation of the action by the petitioner, who describes the disputed property and the competing claimants, and a determination of whether interpleader is proper. This stage of the controversy pits the petitioner, on one side, against the multiple claimants, on the other. But once the interpleader action is deemed proper, the controversy shifts to a dispute among the claimants over the proper allocation of the resource (in this case, the pool of royalties attributable to the standard). The petitioner can, at this stage, retire from the action if it so wishes. Before doing so, however, it must deposit the disputed funds or property in dispute with the court. Today, when specific properties are not

---

<sup>163</sup> The SEP holder's goal in bringing suit at the highest level possible in the production chain is, of course, to maximize its royalties. That is, while a reasonable royalty on a \$20 Wi-Fi chip might be \$0.25, a reasonable royalty on a \$200 router might be \$2.50. See Jorge L. Contreras, *A Brief History of FRAND: Analyzing Current Debates in Standard Setting and Antitrust through a Historical Lens*, 80 ANTITRUST L.J. 39, 74-75 (2015).

<sup>164</sup> A SEP holder would often prefer not to sue a component manufacturer because once the component manufacturer pays the SEP holder a royalty, the SEP is "exhausted" and royalties cannot be charged to more lucrative downstream customers such as integrated product manufacturers or service businesses. See Contreras, FRAND History, *supra* note 163, at 74-75; Lee & Melamed, *supra* note x, at 427 n.201.

at issue, this deposit is often accomplished through the posting of a bond.

The interpleader bond can be any amount that the “court or judge may deem proper.”<sup>165</sup> In a SEP case, the “proper” amount would be related to the likely aggregate royalties owed on the standard. Accordingly, this phase presents an opportunity for the court to begin to evaluate the importance of the standard to the product and the importance of patented technologies to the standard.<sup>166</sup> The interpleading product manufacturer would presumably be liable to pay a royalty for all acts of infringement subject to the six-year statute of limitations and any other limits, and the bond should be set accordingly.

### 3. Serving Process and Preliminary Injunction

Once jurisdiction is established (and the bond is deposited), the next step is to bring all claimants and potential claimants before the court. Statutory interpleader authorizes a district court in an interpleader action to issue process nationwide.<sup>167</sup> In addition, the court may enter an order restraining claimants from “instituting or prosecuting any proceeding in any State or United States court affecting the property, instrument or obligation involved in the interpleader action until further order of the court.”<sup>168</sup> Like the ancient writs of *scire facias*, the process and order is to be “addressed to and served by the United States marshals for the respective districts where the claimants reside or may be found.”<sup>169</sup>

---

<sup>165</sup> 28 U.S.C. § 1335.

<sup>166</sup> See note x, *supra*, and accompanying text.

<sup>167</sup> 28 U.S.C. § 2361. Because all claimants may not be subject to personal jurisdiction in the state in which an interpleader action is brought, the courts have historically characterized interpleader as an action *in rem* or quasi-*in rem*, and have avoided potential due process jurisdictional concerns by recognizing jurisdiction based on the presence of the *res* in the relevant jurisdiction. [cite]

<sup>168</sup> *Id.* It is likely that the injunction would extend to International Trade Commission proceedings in addition to district court proceedings. The injunction language of the statute quoted above is broad, covering any proceeding “affecting the . . . obligation involved.” Even outside the interpleader contexts, there is already precedent for such an injunction. In *Realtek v. LSI*, the district court enjoined LSI from enforcing any exclusion order it might obtain in the ITC pending its determination of the FRAND royalty rate. *Realtek*, 946 F. Supp. 2d at 1010 (N.D. Cal. 2013). The district court went even further in *Microsoft v. Motorola*, enjoining Motorola from enforcing an injunction issued by a German court. The anti-suit injunction was affirmed on appeal. *Microsoft*, 696 F.3d at 889 (9th Cir. 2012).

<sup>169</sup> *Id.*

An interpleader plaintiff could serve all parties that “claim or may claim” a share of the interpleaded royalty. This would include any SEP holder that has contacted the product manufacturer seeking royalties with respect to the standard. It would also include every other entity that participated in the standardization process and submitted FRAND declarations, or which has initiated litigation or made demands against others regarding royalties on the same standard. In the likely event that some patents subject to the FRAND obligation have been assigned to entities that did not participate in the standardization process, the identity of such assignees could be discovered through interrogatories directed to the original patent owners. The assignees could be served subsequently.

The court’s jurisdiction would reach every claimant or potential claimant. Even in an extreme case where a foreign entity that has no other U.S. contacts holds U.S. patents, jurisdiction would still lie in the Eastern District of Virginia.<sup>170</sup> Of course, jurisdiction of the U.S. courts does not extend to disputes over royalties associated with foreign counterpart patents and the interpleader statute does not confer the power to enjoin foreign proceedings.<sup>171</sup>

Moreover, interpleader jurisdiction does *not* require evidence of an actual or imminent case or controversy involving each individual defendant as does a declaratory judgment action.<sup>172</sup> Once an implementer has been sued or received a demand for royalties by at least one SEP owner, it is reasonable to assert that other SEP owners may claim that they are entitled

---

<sup>170</sup> 35 U.S.C. § 293 (conferring jurisdiction upon the Eastern District of Virginia over any non-resident patentee that has not otherwise designated an agent for service of process in “any action respecting the patent or rights thereunder” to be conducted in the same manner as if it had personal jurisdiction over the patentee). Due process would still require such non-resident patentees to have sufficient contacts with the United States as a whole. But in most cases there would be ample contacts to satisfy due process requirements. At a minimum, the defendant must have acquired a U.S. patent that someone (maybe the owner, maybe its predecessor in interest) declared essential to an industry standard practiced in the U.S. Moreover, the owner must be reserving its right to charge royalties of a party practicing the patent. If the owner did not want to charge royalties, it could allow itself to be enjoined from enforcing against the interpleader plaintiff and be excused from the suit with no effort.

<sup>171</sup> While a U.S. interpleader action would, of necessity, have effect only in the United States, it is likely that the royalty allocation determined in such a proceeding would have at least strong persuasive effect in other jurisdictions, and might encourage parties to settle their SEP royalty claims on a global basis.

<sup>172</sup> See *supra* note x. 28 U.S.C. § 2201.

to a share of the royalties on the same standard. Interpleader jurisdiction is sufficiently broad to reach all claimants *and potential* claimants. This facilitates obtaining interpleader jurisdiction over particular patent holders who have not affirmatively asserted their SEPs against a product manufacturer. In the interpleader action it would likely be reasonable to assert that any patentee that participated in the standardization process and declared patents, submitted a FRAND declaration, or subsequently acquired SEPs from such a patentee has a claim or potential claim for royalties on the standard that exceeds the threshold level of minimal substantiality. Thus *all* standard-related patent claims against the product manufacturer pertaining to the interpleaded royalties would be consolidated before a single court in a single action.

#### 4. Litigating Apportionment

Once the court is satisfied that as many claimants and potential claimants as can be found have been served, the case would move to the royalty apportionment phase. In this phase, the SEP holder claimants would be the primary litigants.

##### a. Presenting the Best Evidence

As discussed above in Part X, there are many ways to conduct a top-down apportionment analysis. We do not attempt to advocate a particular method here. We note, however, that the process we are suggesting would give litigants access to certain kinds of valuable evidence that simply does not exist in a typical patent infringement case. Rather than having to rely on third-party studies to count “likely” essential patents, the number of patents at issue would be known. Rather than having to speculate about royalty “stacking” that might arise from future patent assertions, the number of parties claiming royalties would also be known. Rather than rely exclusively on expert testimony to tease out the value of the patents in suit relative to all the other (unidentified) patents in the standard, the other patents in the standard would be identified and their owners present in court to defend their value. As participants in the standardization process (or their successors in interest) and owners of the patents incorporated in the relevant standard, the claimants would be in the best position to advocate the value of their patented technical contributions.

A standard can be seen as a collection of solutions to a set of technical

problems. Rather than evaluate the entire standard on an individual, patent-by-patent basis, it is likely that a court would identify clusters of patents that relate to similar problems. For instance, the CSIRO and LSI patents discussed above<sup>173</sup> might belong to a cluster of patents relating to technologies for solving the “multipath” problem in Wi-Fi networks. A court attempting to apportion Wi-Fi royalties might weigh the importance and difficulty of solving the multipath problem against the other problems that the Wi-Fi standard required to be solved. Then, the court could hear evidence relevant to which multipath-related patents (if any) represented substantial technological advancements as opposed to incremental improvements or arbitrary choices of implementation. The share of royalties allocated for multipath technologies could be allocated accordingly.

Alternatively, one could look at standards as a collection of contributions by standards participants. Rather than go too deep into the weeds of each constituent technology, a court might focus more holistically on the apparent value of the contributions made by each SDO participant. It could evaluate evidence regarding the quantity and quality of the technical submissions of each standards participant. It could then assess the extent to which those technical submissions related to patented or unpatented technologies. From this, it could derive a measure of the relative quantity and quality of patented technology contributed by each participant to the standard as a whole, and allocate royalties accordingly.

b. Adjudicatory Authority: Judge, Jury or Special Master

The determination of patent damages in federal court today is typically a question of fact tried to a jury.<sup>174</sup> But the action in interpleader descends from a court’s traditional exercise of equity jurisdiction, and actions in equity are typically decided by a judge rather than a jury.<sup>175</sup> Given the complexity of the subject matter and the well-known vagaries of jury

---

<sup>173</sup> See notes x and y, and accompanying text.

<sup>174</sup> See, e.g., Mark A. Lemley, *Why Do Juries Decide If Patents Are Valid?*, 99 VA. L. REV. 1673, 1719 (2013) (“[J]ury trials have become the norm in patent cases on ultimate questions of validity as well as infringement and damages issues”).

<sup>175</sup> See DAN B. DOBBS, *LAW OF REMEDIES: DAMAGES, EQUITY, RESTITUTION*, VOL. 1, 57 (1993) (“The non-jury trial remains today one of the three or four most outstanding characteristics of an “equity” trial”).

awards in patent cases,<sup>176</sup> we suspect that many litigants, both SEP holders and infringers, would prefer a bench determination of both the aggregate royalty and the apportionment of royalties among competing claimants to a jury trial. This intuition is borne out by several recent cases involving FRAND royalty determinations in which the parties voluntarily waived their right to a jury trial in favor of a bench trial.<sup>177</sup>

In the context of an interpleader action, we can also envision that during the apportionment phase, the parties might consent to litigate before a special master or panel of special masters. Special master appointment is available pursuant to Rule 53 even as to issues that would traditionally be tried to a jury when the parties consent. The special master approach would allow for a more flexible procedure and the appointment of technically trained masters. Indeed, in the context of a special master proceeding, the apportionment process could draw even more heavily upon valuation techniques commonly employed in patent pools. It seems that all parties would have a strong incentive to consent for the reasons discussed above.

Rule 53 also allows the court to appoint a special master to try non-jury issues without the parties' consent if necessary to "resolve a difficult computation of damages."<sup>178</sup>

### c. The Petitioner's Incentive to Remain Involved

As noted above, although the product manufacturer is the initiator of the interpleader proceeding, it is not legally required to participate in the apportionment phase. Rather, this phase may involve only the adverse claimant SEP holders. Nevertheless, we see many reasons that a product manufacturer initiating an interpleader action might prefer to remain involved in this phase. For example, the product manufacturer could introduce evidence supporting arguments that:

---

<sup>176</sup> See, e.g., Seaman, *supra* note 36, at 1661 ("[t]he competency of juries to decide complex, lengthy cases has long been questioned, particularly for difficult scientific and economic issues"); Jennifer F. Miller, *Should Juries Hear Complex Patent Cases?*, 2004 DUKE L. & TECH. REV. 4, x (2004); Kimberly A. Moore, *Juries, Patent Cases, & A Lack of Transparency*, 39 HOUS. L. REV. 779, 780-82 (2002).

<sup>177</sup> See Contreras, FRAND History, *supra* note 163, at, at 80-84 (discussing parties' stipulation to bench trials in *Microsoft v. Motorola*, *Apple v. Motorola* and *Innovatio*). But see *id.* (noting other cases in which jury trials were used to determine FRAND royalties including *Ericsson v. D-Link* and *LSI v. Realtek*).

<sup>178</sup> Fed. R. Civ. Proc. 53(a)(B)(ii).

- The aggregate royalty should be different from the amount established in the first phase;
- Some of the aggregate royalty should be apportioned to unpatented technologies or technologies claimed in expired patents, thus lowering overall payment to be made to claimants;<sup>179</sup>
- Some of the aggregate royalty should be allocated to the product manufacturer's own patents;<sup>180</sup> and
- Some of the aggregate royalty should be allocated to patents to which product manufacturer already holds a license.<sup>181</sup>

Thus the aggregate royalty established in the first phase would be preliminary and subject to substantial reexamination in the apportionment phase. For jurisdictional purposes, the interpleader plaintiff may be ordered to deposit a bond sufficient to cover the largest amount that the district court judges to be reasonably in controversy.<sup>182</sup> After jurisdiction is established, however, the district court can consider any arguments that plaintiff may present that it is entitled to a share of the amount in controversy or that the true amount in controversy is lower.<sup>183</sup>

## 5. Judgment, Permanent Injunction, Finality

Once the apportionment phase is complete, the court can enter judgment and the clerk may immediately distribute the proceeds of the bond to claimants in accordance with the adjudicated apportionment. The court

---

<sup>179</sup> See notes x, *supra*, and accompanying discussion.

<sup>180</sup> One of the four elements of the original bill of interpleader required that the petitioner have no interest in the disputed subject matter. See Chafee [Modernizing Interpleader], *supra* note x, at 804-42 (criticizing rule). While this requirement was eliminated from the Federal Interpleader Act, it remains in the procedural codes of many states. See COUND, FRIEDENTHAL, MILLER & SEXTON, CIVIL PROCEDURE 585 (4<sup>th</sup> ed. 1985).

<sup>181</sup> Many industries in which technical standards are prevalent are characterized by cross license agreements among major market players. See, e.g., Peter C. Grindley & David J. Teece, *Managing Intellectual Capital: Licensing and Cross-Licensing in Semiconductors and Electronics*, 39 CAL. MGMT. REV. 9, 9-10, 24-25 (1997). In addition, some patents essential to a particular version of a standard may have been licensed to a manufacturer as part of a license to an earlier version of the standard.

<sup>182</sup> WRIGHT & MILLER § 1716.

<sup>183</sup> Chafee – Broadening the Second Stage of Interpleader.

may also “discharge the plaintiff from further liability, make the injunction permanent, and make all appropriate orders to enforce its judgment.”<sup>184</sup> Thus, the parties served in the case could be permanently enjoined from further asserting their patents against the interpleader plaintiff with respect to the interpleaded royalties.

The resulting judgment would be *res judicata* as to all royalties due for past sales of the infringing product at issue in the suit. It therefore would avoid the concern that some courts have expressed that adjudicating a FRAND royalty is merely an “advisory opinion” that the parties can use as further leverage in licensing negotiations.<sup>185</sup> A concrete, discrete set of legal claims would be fully and finally resolved as a result of the action.

The resulting judgment would also have broader legal and practical effects. Under ordinary principles of *collateral estoppel*, claimants should be precluded from re-litigating the aggregate royalty due on products that are the same as or similar to the products at issue in the initial suit. The aggregate royalty payable on a Wi-Fi router, for example, might differ from the aggregate royalty on a Wi-Fi-enabled refrigerator. There is no apparent reason why the aggregate royalty should vary significantly from router to router, however.

Moreover, it seems likely that in many cases SEP owners would be precluded from re-litigating apportionment of the aggregate royalty, even for different types of products. That is, even if the aggregate reasonable royalty might be different for routers versus refrigerators, the *relative* contributions of each SEP owner’s patented technologies to the standard should be consistent in many cases. SEP owners would have had a full and fair opportunity to litigate the relative value of their patented contributions to the standard in the first interpleaded case. Presumably, each one would have had more than adequate incentive to claim the largest share of standards royalties that they could get in the first suit. There seems to be no reason why those SEP owners should be entitled to re-litigate their royalty share in a subsequent suit.

Litigating the aggregate royalty on a product-class by product-class basis, while still more efficient than the current system of individual bilateral suits, is not ideal. As a result, the natural tendency may be for

---

<sup>184</sup> 28 U.S.C. §2361.

<sup>185</sup> See Part II.D, *supra*.

suppliers of the “smallest saleable patent practicing unit” (SSPPU) implementing the standard to take the initiative to acquire licenses through interpleader suits. This may enable component suppliers to efficiently acquire broad, exhaustive standards patent rights that they could pass on to their customers.

Other product manufacturers who are not parties to the interpleader suit would not be bound by collateral estoppel.<sup>186</sup> It is possible that a product maker who is displeased with the distribution of royalties awarded under the first suit could seek to re-litigate it. As a practical matter, however, that seems unlikely. First, the product manufacturers that have the greatest incentive to re-litigate apportionment are those that are also SEP holders. If they hold SEPs, then presumably they would have been party to the first suit as claimants and therefore bound by collateral estoppel. Second, the apportionments made in the first suit could be admissible evidence in the second suit. If so, that would exert a strong influence over the trier of fact. It could therefore serve as an influential bellwether case similar to those that are used to drive settlement of multiparty product liability cases and other mass torts.<sup>187</sup>

In sum, it is conceivable that a single interpleader proceeding could have the practical effect of eliminating substantially all litigation over patents essential to practicing a given standard.

#### *D. Other Considerations*

##### 1. Statutory Interpleader versus Joinder Mechanisms under the FRCP

The Federal Rules of Civil Procedure provide several alternative means of haling multiple SEP owners into a common court. Permissive joinder under Rule 20 is available when the right to relief is asserted against multiple defendants jointly, severally, or in the alternative with respect to or

---

<sup>186</sup> Conceivably, the plaintiff could bring an interpleader class action on behalf of itself and similarly situated manufacturers. That approach might lead to even more finality. One obstacle is that unlike an ordinary plaintiff who seeks to *recover* money, an interpleader plaintiff is trying to *pay* money. The normal economic incentives for class actions therefore do not apply. The authors are grateful to Paul Gugliuzza for this insight.

<sup>187</sup> See Rothstein & Borden, *Managing Multidistrict Litigation in Products Liability Cases*, Federal Judicial Center Judicial Panel on Multidistrict Litigation, available at <http://bit.ly/1WXCK18>.

arising out of the same transaction, occurrence, or series of transactions or occurrences and there are common questions of law or fact. Compulsory joinder is available under Rule 19 for any party whose presence is necessary to accord complete relief among the existing parties.<sup>188</sup> Even an interpleader procedure similar to the statutory interpleader mechanism described in this article is available under Rule 22.<sup>189</sup> In certain cases, these rules might be sufficient to join all of the necessary parties to the same suit.

In many cases involving SEPs, however, none of these federal rules procedures is likely to offer complete relief. It is unlikely that under ordinary jurisdictional rules all of the necessary SEP holders will be amenable to suit in a single jurisdiction. Thus, service of process presents a problem. Even if process were available in a single jurisdiction, it is likely that at least two SEP owners will be non-diverse, thus destroying diversity jurisdiction. Statutory interpleader solves both of these problems by allowing nationwide service of process and requiring only minimal diversity.

Moreover, the consolidation of claims in a single proceeding is largely at the discretion of the trial court. In some cases, courts may prefer to limit the number of patents at issue for case management reasons. For example, in *Huawei v. T-Mobile*, the court severed Nokia's counterclaims asserting SEPs against Huawei "to reduce the complexity of the cases," even though severing those counterclaims would "require eight jury trials to resolve a single controversy between these two parties over essential patents."<sup>190</sup> Such broad discretion to omit patents is not allowed to the court presiding over an interpleader proceeding.

In *Innovatio*, the court employed Multi-District Litigation procedures<sup>191</sup> to manage suits that had been brought against a large number of diverse defendants. MDL enables the court to consolidate pre-trial proceedings, but does not provide authority to consolidate suits for trial without the consent of the parties. Thus, MDL ultimately fails to provide for consolidated resolution of competing claims to standard-related royalties. Moreover,

---

<sup>188</sup> Fed. R. Civ. Proc. 19; *Prima Tek II, L.L.C. v. A-Roo Co.*, 222 F.3d 1372, 1377 (Fed. Cir. 2000).

<sup>189</sup> Fed. R. Civ. Proc. 22 ("Persons with claims that may expose a plaintiff to double or multiple liability may be joined as defendants and required to interplead.")

<sup>190</sup> *Huawei Techs. Co. Ltd. v. T-Mobile US Inc.*, Order, Case No. 2:16-cv-52-JRG-RSP, slip op. at 2 (E.D. Tex. Jul. 10, 2016).

<sup>191</sup> cite

MDL procedures are inadequate to resolve all potential claims. Theoretically, an implementer might simultaneously sue all SEP owners who contacted it to demand excessive royalties. The implementer might then attempt to consolidate these separate suits using MDL procedures. There would be no basis, however, to assert jurisdiction over SEP owners who had yet to contact the implementer to demand royalties. Interpleader jurisdiction is unique in that it confers jurisdiction over all claimants *and potential* claimants.

## 2. Waking the Sleeping Dogs

Interpleader offers a procedural mechanism to join all holders of SEPs relating to a standard in a single action. But of course, not all SEP holders today actively assert their SEPs, either in litigation or through licensing demands. There are many reasons that such “sleeping dog” SEP holders might elect not to seek royalties with respect to their SEPs, including a business model directed primarily to “defensive” use of patents, unwillingness or inability to spend the sums required to mount substantial patent licensing and litigation programs, and questions regarding the validity, enforceability or value of SEPs.<sup>192</sup> Thus, while these sleeping dog SEP holders might never have sought royalties with respect to their SEPs, waking them through interpleader could prompt their action where none would otherwise have been taken. As such, a product manufacturer could face a higher aggregate royalty burden after undergoing an interpleader action than it would have by simply facing the most aggressive individual SEP holders one by one.

While this risk certainly exists, our goal is not merely to minimize the FRAND royalty burden on product manufacturers. Rather, we offer a systemic solution to the problem of inconsistent bottom-up FRAND royalty determinations. In some cases, involving all relevant SEP holders in the royalty determination could result in a higher royalty payment for product manufacturers. However, we believe that this outcome is not likely given, among other things, the prevalence of SEP acquisition and assertion by non-practicing entities in recent years. There is no reason to believe that SEPs

---

<sup>192</sup> See Contreras, Fixing FRAND, *supra* note 27, at 62 (discussing motivations of sleeping dog SEP holders). See also Jorge L. Contreras, *FRAND Market Failure: IPXI’s Standards-Essential Patent License Exchange*, 15(2) CHI-KENT J. INTELL. PROP. 419 (2016) (discussing dubious involvement of non-asserting SEP holders in plan to monetize Wi-Fi patents).

covering widely implemented standards will lie unasserted and unmonetized forever.<sup>193</sup> This suggests that forcing a resolution of the royalties due with respect to such SEPs through interpleader will simply be accelerating a determination that is bound to occur, rather than precipitating a determination (and concomitant payment obligation) that never would have occurred absent the interpleader action.

Finally, we note that the impact of waking the sleeping dogs is likely to be less for component suppliers than it may be for end-user product makers. As discussed above, it seems most likely that component suppliers would be the ones to take advantage of interpleader. For them, the opportunity to pass on to their customers the equivalent of a fully exhaustive license to all SEPs could be an attractive selling point supporting higher prices. Moreover, the prices of the components they supply are generally much lower than the prices of end-user products into which they are incorporated. Accordingly, they have a smaller royalty base, a larger percentage of the value of which is attributable to the standard. The risk of incurring an unreasonable outlier royalty award is therefore arguably lower than it may be in the case of suits involving more complex end-user products. Suppose the reasonable aggregate royalty were expected to be in the range of five to fifty percent. The aggregate royalty assessed on a twenty-dollar component would be therefore in the range of one to ten dollars. On a \$600 smartphone, however, the same range of royalty rates yields an aggregate royalty from thirty to three hundred dollars. Assessed on a \$2,000 laptop, the same range of royalty rates yields an aggregate royalty of between \$100 and \$1000. For most standards, it is difficult to envision a court assessing an aggregate royalty on a component that is so high as to be less favorable to the implementer than even a handful of smaller royalty rates applied at the end-user product level.

## CONCLUSION

The bottom-up nature of reasonable royalty calculations in disputes involving standards-essential patents subject to FRAND commitments has yielded inconsistent and incongruous results in which certain patent holders may be over-compensated or under-compensated. While individual royalty

---

<sup>193</sup> See *Contreras, Stranger*, *supra* note x (observing that many former “sleeping dogs” have transferred SEPs to patent assertion entities for the purpose of asserting and monetizing such patents).

determinations in these proceedings may seem to adhere to judicial and contractual requirements regarding “reasonableness”, there is no reason to believe that the aggregate royalty rates established through these uncoordinated, serial processes will be reasonable in terms of the overall value that the patented technology contributes to the standard or the product.

To address this problem, we propose that the mechanism of statutory interpleader be used to join the holders of all patents covering a particular technology standard into a single proceeding in which an aggregate “reasonable” royalty may be determined and then apportioned among the holders of individual standards-essential patents. This approach will both enhance fairness of royalty determinations and reduce the costs inherent in multiple independent proceedings. Finding such a solution is particularly critical today, as technology convergence continues to impact standardization in key areas such as next-generation wireless communication and the Internet of Things.