

The Incremental Value of Apportionment in Reasonable Royalty Patent Damages Analysis

Michael J. Chapman*

Introduction

Reasonable royalty damages determinations in patent infringement cases have come under significant scrutiny in recent years. In particular, federal courts have paid significant attention to the methodologies used for isolating and estimating the contribution of litigated technologies used in multi-component accused products as they have faced substantial challenges in ensuring that damages awards reasonably reflect the contributions of litigated patented technologies to such products. As a result, cases and articles addressing patent damages issues have increasingly focused on the term “apportionment,” the segregation of benefits (*e.g.*, profits) generated by the patented technology from benefits generated by non-patented contributors of value (*e.g.*, non-patented technology, marketing capability, distribution networks).

Many of the recent apportionment-related discussions have focused on the determination of the appropriate *royalty base* that should be used in assessing reasonable royalty damages when the patented technology is incorporated into a complex, multi-component accused product.¹ Since the 2009 intro-

* Michael J. Chapman is Founder and President of Envision Economics, LLC, a boutique economic damages consulting firm specializing in intellectual property litigation and other commercial disputes. Dr. Chapman has worked as an economic damages expert for nearly 20 years and has been involved in scores of patent infringement litigations. The views expressed here are Dr. Chapman’s alone, and they reflect his current understanding of the issues addressed here.

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¹ See generally *Power Integrations, Inc., v. Fairchild Semiconductor Int’l, Inc.*, 894 F.3d 1258 (Fed. Cir. 2018); *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332 (Fed. Cir. 2018); *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299 (Fed. Cir. 2018); J. Gregory Sidak, *The Proper Royalty Base for Patent Damages*, 10 J. COMPETITION L. & ECON. 989, 990–91 (2014); Damien Geradin & Anne Layne-Farrar, *Patent Value Apportionment Rules for Complex, Multi-Patent Products*, 27 SANTA CLARA HIGH TECH. L.J. 763 (2012); Josh Friedman, *Apportionment: Shining the Light of Day on Patent Damages*, 63 CASE W. RES. L. REV.

duction of the “Smallest Saleable Patent Practicing Unit” (“SSPPU”) concept into patent damages analyses in *Cornell v. Hewlett-Packard Co.*,² court reliance on the SSPPU for calculating reasonable royalty damages has become the norm, even as courts have rendered sometimes conflicting opinions on the necessity and appropriateness of using the SSPPU as a royalty base in assessing reasonable royalty damages.³ During the same period, courts have also issued multiple decisions concerning the application of the “Entire Market Value Rule” (“EMVR”),⁴ which permits the full value of an accused product to be used as the royalty base for the determination of the reasonable royalty damage under appropriate circumstances.⁵ In 2018 alone, the Court of Appeals for the Federal Circuit (“Federal Circuit”) handed down several important decisions that addressed the selection of the royalty base to be used in a reasonable royalty damages determination.⁶

In recent years, courts have also demonstrated increasing interest and concern about the issue of properly apportioning value between asserted patents and other sources of value in the analysis of the *royalty rate* that is used in

147 (2012); Elizabeth M. Bailey et al., *Making Sense of “Apportionment” in Patent Damages*, 12 COLUM. SCI. & TECH. L. REV. 255 (2011); Eric E. Bensen, & Danielle M. White, *Using Apportionment to Rein in the Georgia-Pacific Factors*, 9 COLUM. SCI. & TECH. L. REV. 1 (2008); Anne Layne-Farrar, *The Patent Damages Gap: An Economist’s Review of U.S. Patent Damages Apportionment Rules*, SSRN (April 4, 2017), <https://ssrn.com/abstract=2911289> [<https://perma.cc/7E6Z-ZZNW>].

² *Cornell Univ. v. Hewlett Packard, Co.*, 609 F. Supp. 2d 279, 287–88 (N.D.N.Y. 2009).

³ See Michael Risch, *(Un)Reasonable Royalties*, 98 BOS. U.L. REV. 187, 235 (2018). The author states:

By 2013, courts were calling apportionment to the smallest salable unit a requirement, with a royalty based on sales price now an exception to the rule under the ‘entire market value rule.’ Suddenly, the smallest salable unit rule was engrained as if it had always been the law, despite having been made out of whole cloth just a couple years earlier.

Id. (internal citations omitted).

⁴ See, e.g., *Power Integrations*, 894 F.3d at 1258; *Commonwealth Sci. & Indus. Research Org. v. Cisco Sys., Inc.*, 809 F.3d 1295 (Fed. Cir. 2015); *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308 (Fed. Cir. 2014).

⁵ See Brian J. Love, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STAN. L. REV. 263, 264 (2010). The author states:

The entire market value rule allows for recovery of patent infringement damages based on the value of an entire product or device containing an infringing component, rather than on the value of the infringing component alone, provided that the entire value of the device as a whole is legally attributable to the patented invention.

Id.

⁶ See, e.g., *Power Integrations*, 894 F.3d at 1258; *Exmark Mfg. Co.*, 879 F.3d at 1332; *Finjan, Inc.*, 879 F.3d at 1299; see also *Sprint Comm’n Co. v. Time Warner Cable, Inc.*, 760 Fed. App’x 977 (Fed. Cir. 2018).

reasonable royalty rate damages determinations.⁷ In such cases, courts often apply an “apportionment” analysis to the *royalty rates* that are derived from “comparable licenses” that are used as the basis for determining the relevant reasonable royalty rate.⁸ In this context, courts have emphasized that the reasonable royalty rate derived from a royalty rate reflected in comparable licenses should be limited to the portion of the comparable license royalty rate that corresponds to the estimated value contributed by the patented technology at issue.⁹

In short, the rules concerning apportionment in reasonable royalty damages determinations have undergone substantial refinement and evolution in recent years. However, to date, courts have not clearly articulated the underlying principles that govern this development, resulting in decisions that are sometimes difficult to reconcile and/or explain because, “it appears that the parameters for deciding when to use the entire market value rule (EMVR) and when to use the smallest saleable patent-practicing unit (SSPPU) are still being defined on a case-by-case basis.”¹⁰

This article seeks to provide a framework for evaluating and understanding the disparate decisions and principles concerning apportionment issues that have been articulated in recent years. The critical reference point for this framework is the Federal Circuit’s determination that “[t]he essential requirement [for reasonable royalty damages awards] is that the *ultimate reasonable royalty award must be based on the incremental value that the patented invention adds* to the end product.”¹¹ Given this requirement, a natural question to consider when seeking to understand and evaluate recent apportionment related judicial decision is: Do the apportionment rules developed by the courts increase the likelihood that *reasonable royalty damages* awards reflect the *incremental value* generated by the use of the technology at issue? Addressing this question is an important objective of the article.

This article also emphasizes that the apportionment exercise that is required for assessing reasonable royalty *damages* must recognize the fundamental interdependence between the selected *royalty base* and the selected *royalty*

⁷ See *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 79 (Fed. Cir. 2012); *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1317 (Fed. Cir. 2011); *ResQNet.com v. Lansa, Inc.*, 594 F.3d 860, 871–72 (Fed. Cir. 2010); *Wordtech Sys., Inc. v. Integrated Networks Sol., Inc.*, 609 F.3d 1308, 1321 (Fed. Cir. 2010).

⁸ *Exmark Mfg. Co.*, 879 F.3d at 1348–49.

⁹ See *ResQNet.com*, 594 F.3d at 871.

¹⁰ John Jarosz, et al., *Patent Damages in US Courts: Overview of Current State of Play*, IAM-MEDIA (Sept. 26, 2018), <https://www.iam-media.com/patent-damages-us-courts-overview-current-state-play> [<https://perma.cc/VHU2-AM9R>].

¹¹ See *Exmark Mfg. Co.*, 879 F.3d at 1348 (emphasis added) (citing *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014)).

rate—because reasonable royalty damages are typically the product of both of these variables.¹² The failure to consider these variables together is likely to lead to “*Franken-Damages*,” in which a mismatched royalty base and royalty rate are combined into a damages estimate that is highly unlikely to result in damages that are reasonable or consistent with the incremental value of practicing patented technology-at-issue.

The article is developed in four parts. Part I provides an overview of patent damages, as well as background on the history and meaning of “apportionment.” Part II introduces the economic concept of incremental value, describes the quantification of incremental value, and discusses the link between incremental value and the determination of reasonable royalty damages. Part III discusses the importance of using conforming royalty rate-royalty base combinations to avoid “Franken-Damages,” examines the strengths and weaknesses of using an SSPPU and the entire value of the accused product as a royalty base, and considers the royalty rate apportionment.

I. Background

Before addressing the details of current apportionment rules applicable to the determination of reasonable royalty damages, this section introduces the various forms of patent infringement damages, provides historical context for the use of apportionment in reasonable royalty damages analysis, and explains the importance of proper apportionment to the accurate assessment of reasonable royalty damages.

A. Overview of Patent Damages

1. Statute

35 U.S.C. § 284 governs recovery for patent infringement:

Upon finding for the claimant 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 made of the invention by the infringer, together with interest and costs as fixed by the court The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.¹³

¹² See *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1338–39 (Fed. Cir. 2009) (citing RAYMOND T. NIMMER & JEFF DODD, *MODERN LICENSING LAW* § 7.5 (Thomson West, 2008)).

¹³ 35 U.S.C. § 284 (2006); see *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1349 (Fed. Cir. 1999) (“The phrase ‘damages adequate to compensate’ means ‘full compensation for ‘any damages’ [the patent owner] suffered as a result of the infringement.’”) (quoting *Gen. Motors Corp. v. Devex Corp.*, 461 U.S. 648, 654–55 (1983)).

The Federal Circuit has interpreted this provision to mean that the holder of an infringed patent should be placed in the same financial position that the holder would have been in had its patent not been infringed.¹⁴

A variety of measures are available to ascertain the patent holder's damages. As a practical matter, these measures can be divided into two types: (1) measures of the patent holder's "actual" damages; and (2) measures of the patent holder's "reasonable royalty" damages.¹⁵

2. Actual Damages

"Actual" damages are intended to quantify specific losses suffered by the patent holder that are attributable to the infringement at issue.¹⁶ Actual damages include lost profits damages,¹⁷ price erosion damages,¹⁸ and lost

¹⁴ *Weinar v. Rollform Inc.*, 744 F.2d 797, 807–08 (Fed. Cir. 1984).

¹⁵ Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655, 655 (2009).

¹⁶ See *Proctor & Gamble Co. v. Paragon Trade Brands, Inc.*, 989 F. Supp. 547, 600 (D. Del. 1997) ("A determination of lost profits or an established royalty are methods of assessing the actual damages suffered by the patentee.") (internal citations omitted); see also *Del Mar Avionics, Inc. v. Quinton Instrument Co.*, 836 F.2d 1320, 1328 (Fed. Cir. 1987).

¹⁷ Lost profits damages are defined as the difference between "but-for" profits that the patent holder would have made if there had been no infringement and "actual" profits that the patent holder made in the presence of the infringement. To be eligible for lost profits damages, the patent holder is required to prove that infringing sales would have been made by the patent holder in the absence of infringement, quantify the number of sales displaced and demonstrate the amount of profit that the patent holder would have made on these lost sales. See *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1156 (6th Cir. 1978). In *Panduit*, the court opined:

To obtain as damages the profits on sales he would have made absent the infringement, i.e., the sales made by the infringer, a patent owner must prove: (1) demand for the patented product, (2) absence of acceptable non-infringing substitutes, (3) his manufacturing and marketing capability to exploit the demand, and (4) the amount of the profit he would have made.

Id. The issue of apportionment in lost profits damages analyses has received substantial attention in recent years, but is beyond the scope of this article. See Love, *supra* note 5; Eric E. Bensen, *Apportionment of Lost Profits in Contemporary Patent Damages Cases*, 10 VA. J.L. & TECH. 1, 1 (2005). The Federal Circuit recently issued a decision in *Mentor Graphics Corp. v. EVE-USA, Inc.* that held that no further apportionment to a lost profits damages determination is needed if all of the *Panduit* factors have been met. See 851 F.3d 1275, 1288 (Fed. Cir. 2017) ("We hold today that on the undisputed facts of this record, satisfaction of the *Panduit* factors satisfies principles of apportionment: Mentor's damages are tied to the worth of its patented features.").

¹⁸ Price erosion damages measure the extent that the patent holder's profits on sales made by the patent holder despite the infringement were reduced because the infringement forced

royalty revenues where an established royalty for the patent-at-issue exists.¹⁹ Reimbursement of these damages should put the patent holder in the same financial position that it would have been in had its patent not been infringed.

3. Reasonable Royalty Damages

Even if actual damages cannot be established, a patent holder is entitled to “reasonable royalty” damages.²⁰ A reasonable royalty is a legal construct designed to ensure that the patent holder will receive “adequate compensation” for the unauthorized use of the patent holder’s intellectual property, as required by 35 U.S.C. § 284.²¹ As a practical matter, Courts have significant flexibility and discretion in determining reasonable royalty damages and rely upon a wide variety of considerations in reaching their determinations.²²

the patent holder to lower its prices. *See* *Vulcan Eng’g Co. v. Fata Aluminum, Inc.*, 278 F.3d 1366, 1377 (Fed. Cir. 2002).

¹⁹ *Proctor & Gamble*, 989 F. Supp. at 600; *see also* Bryan W. Butler, *Patent Infringement: Compensation and Damages* § 4.01 (L.J. Press 2018). Butler stated:

The legal theory behind calculating an award based on an established royalty is that had the infringer taken a license, the terms and conditions of [the license] would have been identical to other licensees. Thus, the actual injury the patent owner has suffered is the revenue that would have been realized had the infringer taken that license.

Id. (citing *Del Mar Avionics, Inc. v. Quinton Instrument Co.*, 836 F.2d 1320, 1328 (Fed. Cir. 1987)).

²⁰ 35 U.S.C. § 284 (2006); *see Panduit*, 575 F.2d at 1157.

²¹ Reasonable royalties are sometimes described as a “floor” on patent damages because the concept was developed by courts to avoid potential unfairness in circumstances where a patent holder is able to demonstrate infringement but is unable to prove *actual* damages. *See* *U.S. Frumentum Co. v. Lauhoff*, 216 F. 610, 617–18 (6th Cir. 1914) (“It is a travesty to allow property rights to be seized and enjoyed without remedy simply because of the supposed difficulty in establishing their value.”). Prior to the development of reasonable royalty damages, such a patent holder was likely to receive nominal damages, even if the infringer realized substantial benefits from the infringement. The early understanding of reasonable royalty damages was explained in *Frumentum* as follows:

This damage or compensation is not, in precise terminology, a royalty at all, but it is frequently spoken of as a “reasonable royalty”; and this phrase is a convenient means of naming this particular kind of damage. It may also be well called “general damage”; that is to say, damage not resting on any of the applicable, exact methods of computation but upon facts and circumstances which permit the jury or the court to estimate in a general, but in a sufficiently accurate, way the injury to plaintiff caused by each infringing sale.

Id. at 617 (emphasis added).

²² *See* *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

a. Building Blocks

Generally, courts calculate reasonable royalty damages using two components: (1) a royalty base; and (2) a royalty rate.²³

(1). Royalty Base

The royalty base is the universe of sales that is used to calculate reasonable royalty damages and is typically expressed as either a monetary value, such as net sales, or in units of infringing products sold. In recent years, courts have given substantial attention to the process for identifying the royalty base to be used in the calculation of reasonable royalty damages in cases involving complex, multi-component products, as courts have sought to establish rules governing the scope of products that are permitted to be considered in the determination of reasonable royalty damages.²⁴

The royalty base used in calculating reasonable royalty damages typically take one of two forms: (1) the smallest saleable patent practicing unit (“SSPPU”); and (2) the entire market value of the accused product at issue in the case.²⁵ These royalty base forms will be described in more detail below.

(2). Royalty Rate

The royalty rate is applied to the royalty base to determine reasonable royalty damages and is typically expressed as either a percentage that is applied to a monetary value royalty base or a per-unit rate that is applied to a unit-based royalty base.

²³ In some instances, reasonable royalty damages are awarded on a lump-sum basis—which may or may not have been derived from an underlying estimate of a royalty base and royalty rate. *See* *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1326 (Fed. Cir. 2014) (“A reasonable royalty may be a lump-sum payment not calculated on a per unit basis, but it may also be, and often is, a running payment that varies with the number of infringing units. In that event, it generally has two prongs: a royalty base and a royalty rate.”); FED. TRADE COMM’N, *THE EVOLVING IP MARKETPLACE: ALIGNING PATENT NOTICE AND REMEDIES WITH COMPETITION: A REPORT OF THE FEDERAL TRADE COMMISSION 204* (2011), <http://www.ftc.gov/os/2011/03/110307patentreport.pdf> [<https://perma.cc/TFA2-VBLD>]. Analyzing the basis for determining damages in instances where a lump-sum payment is not derived based on an underlying estimate of a royalty base and royalty rate is outside the scope of this article.

²⁴ *See, e.g.*, *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 894 F.3d 1258 (Fed. Cir. 2018); *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299 (Fed. Cir. 2018); *Exmark Mfg. Co. v. Briggs & Stratton Power Products Grp., LLC*, 879 F.3d 1332 (Fed. Cir. 2018); *Commonwealth Sci. and Indus. Research Org. v. Cisco Sys., Inc.*, 809 F.3d 1295 (Fed. Cir. 2015); *VirnetX, Inc.*, 767 F.3d 1308; *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292 (Fed. Cir. 2011); *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1337 (Fed. Cir. 2009); *Cornell Univ. v. Hewlett Packard, Co.*, 609 F. Supp. 2d 279 (N.D.N.Y. 2009).

²⁵ Layne-Farrar, *supra* note 1, at 1.

The determination of the proper royalty rate to be used in calculating reasonable royalty damages commands a substantial portion of analytical effort by experts and fact-finders that goes into such calculations, because, “[d]efining a reasonable royalty rate is in many ways an art as opposed to a science, and, as such, rates are perennially the subject of heated debate.”²⁶ In this regard, a number of different approaches are commonly used in such analyses,²⁷ including: (1) the Incremental Benefit (or Income) Approach, which seeks to identify the gains generated by the use of the patent;²⁸ (2) the Licensing Comparables (or Market) Approach, in which an appropriate price (*i.e.*, royalty rate) for the use of the patents-at-issue is derived from the examination of the terms of actual transfers of rights (*e.g.*, licenses) involving comparable technology;²⁹ and (3) the Design-Around (or Cost/Cost Savings) Approach, in which royalty rates are derived from the costs that the infringer would have incurred to generate the benefits of the patent without practicing the patent.³⁰ In any given case, any or all of these approaches may be used in the determination of a reasonable royalty rate, depending on the availability of the data needed to undertake each analysis.

(3). *Interdependence*

Courts typically calculate reasonable royalty *damages* tied directly to infringing activity by *multiplying the royalty base by the royalty rate*.³¹ Consequently,

²⁶ Geradin & Layne-Farrar, *supra* note 1, at 764.

²⁷ See, *e.g.*, SHANNON P. PRATT ET AL., VALUING A BUSINESS: THE ANALYSIS AND APPRAISAL OF CLOSELY HELD COMPANIES 149–258 (McGraw Hill, 4th ed. 2000); GORDON V. SMITH & RUSSELL L. PARR, VALUATION OF INTELLECTUAL PROPERTY AND INTANGIBLE ASSETS 151–73 (John Wiley & Sons, 2d ed. 2000); ROBERT F. REILLY & ROBERT P. SCHWEIHS, VALUING INTANGIBLE ASSETS 95–202 (McGraw-Hill, 1st ed. 1999).

²⁸ In particular, an Incremental Benefits analysis calls for an evaluation of the benefits of practicing the patent versus the benefits of practicing the non-infringing, next-best alternative. See John C. Jarosz & Michael J. Chapman, *The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769, 813–18 (2013).

²⁹ Inferences are drawn from those other transactions to identify terms for a hypothetical license to which prudent parties would (or should) agree. The closer the “other” transactions are in comparability to the hypothetical transaction under consideration, the more useful the information. *Id.* at 818–23.

³⁰ In essence, a Design-Around Cost analysis is a form of Incremental Benefits analysis that evaluates the cost of avoiding infringement by adopting the non-infringing, next best alternative. See Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Damages for Patent Infringement*, 2010 BYU L. REV. 1661, 1667 (2010).

³¹ In some instances, reasonable royalty damages are awarded on a lump-sum basis—which may or may not have been derived from an underlying estimate of a royalty base and royalty rate. See *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1326 (Fed. Cir. 2014); FED. TRADE COMM’N, *supra* note 23, at 204. Analyzing the basis for determining damages

the accuracy and reliability of a reasonable royalty damages award depends heavily on the consistency and conformity of the selected royalty base and the selected royalty rate, which can be a significant issue in cases involving complex, multi-component products where the value created by the use of the patented technology may involve only a small portion of the overall infringing product. As explained by Elizabeth M. Bailey, Alan Cox, and Gregory K. Leonard:

Parties engaged in licensing negotiations, as well as litigants, care about the total dollar amount of royalties. The royalty rate and the royalty base must be chosen in conjunction so that the product of multiplying them will yield a dollar amount that reflects the economic value of the patented technology.³²

To understand the importance of royalty base-royalty rate conformity, consider a multi-component accused product that commands a \$100.00 product price and contains an infringing component (*i.e.*, SSPPU) that has a value of \$40.00. If it is known that the use of a patented technology generates \$10.00 in value for the infringer, this amount could be calculated by applying a 10.0% royalty rate to the \$100.00 product price or by applying a 25.0% royalty rate to \$40.00 value of the SSPPU. From a mathematical perspective, these calculations are equivalent, as shown in Figure 1.

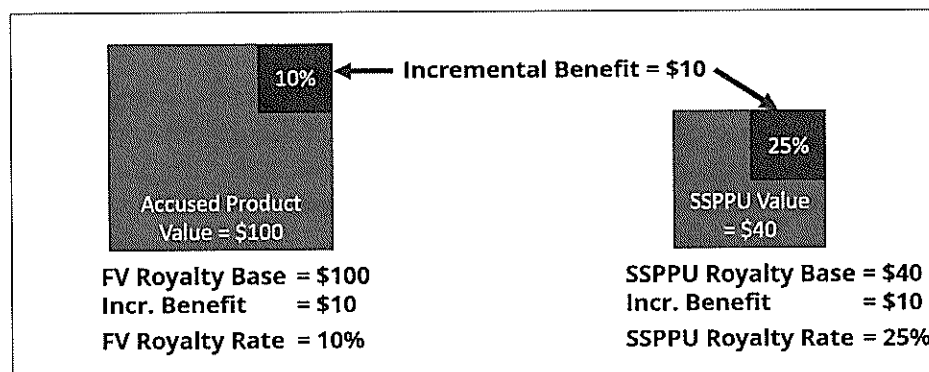


Figure 1

If there were a comparable license that included a rate of “25.0[%] of the value of the *infringing component/SSPPU*” that was available in this proceeding, the court could reasonably use this royalty rate to calculate reasonable royalty damages if and only if the court applies this rate to the value of the *infringing component*. However, if the court applies the 25.0% royalty rate

in instances where a lump-sum payment is not derived based on an underlying estimate of a royalty base and royalty rate is outside the scope of this Article.

³² Elizabeth M. Bailey et al., *Three Cases Reshaping Patent Licensing Practice*, *MANAGING INTELL. PROP.*, March 2010, at 119, 120.

to the \$100.00 *product price*, the resulting “damages” would greatly exceed the actual \$10.00 value contributed by the patented technology. Similarly, if the court applies a 10.0% rate to the value of the SSPPU only, the resulting “damages” calculation would understate the true (*i.e.*, \$10.00) incremental value for the patent. These results are shown in Figure 2.

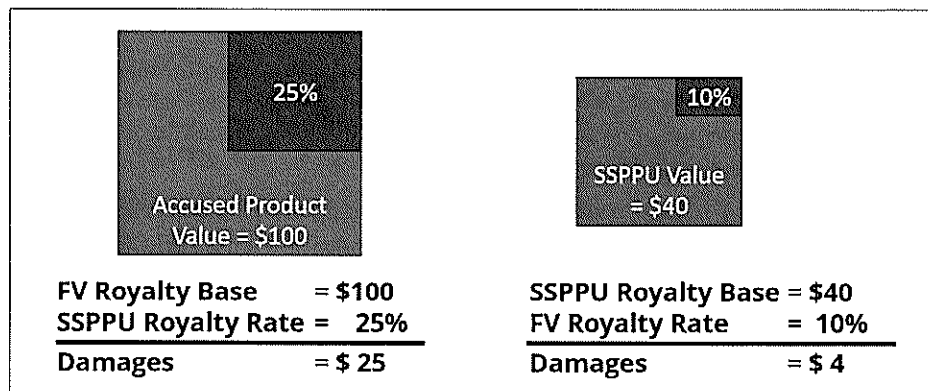


Figure 2

Such “damages” can be referred to as “Franken-Damages” due to the mismatching of parts of the calculation and are unlikely to reflect the incremental value of using the technology at issue.

In light of the foregoing, the royalty base and royalty rate selected for the calculation of reasonable royalty damage must be considered jointly to ensure that the resulting damages calculation makes economic sense (*i.e.*, correspond to the actual value of using the patented technology).

*Cornell v. Hewlett-Packard*³³ provides a classic, real-world example of *Franken-Damages*.³⁴ At the conclusion of that case, the jury awarded reasonable royalty damages of \$184 million based on a royalty base equal to sales of “CPU bricks” sold by Hewlett-Packard and a royalty rate of 0.8% of net sales of these components.³⁵ In response to post-trial motions, the presiding judge reduced the royalty base from CPU Bricks to “processors” (which were components within the CPU Bricks) but applied the “jury’s uncontroverted royalty rate of 0.8[%]” to this reduced royalty base—thereby reducing damages awarded to \$53 million.³⁶ The court did not provide any analysis or

³³ 609 F. Supp. 2d 279 (N.D.N.Y. 2009).

³⁴ *See id.* at 287–88.

³⁵ *Id.* at 282.

³⁶ *Id.* at 292. The court stated:

Therefore, this court grants Hewlett-Packard’s motion for JMOL that the hypothetical processor revenue of \$8,061,545,086, not the hypothetical CPU brick revenue, is the appropriate royalty base Thus, as a matter of law, Cornell is entitled to damages

discussion to demonstrate that the royalty rate that was deemed applicable by the jury to the “CPU Brick” would have been the same rate that would apply to processors.³⁷ As a result, there is no reason to believe that the mismatched components of the damages calculation represented a reasonable estimate of the incremental benefits of the patented technology in that case.

b. Georgia-Pacific Factors

From a legal perspective, the most important reference point for the determination of reasonable royalty damages is the 1970 opinion from the Southern District of New York in *Georgia-Pacific Corp. v. United States Plywood Corp.*³⁸ Since that opinion, *Georgia-Pacific* has become the foundation of modern reasonable royalty damages analysis and has been referred to as “the touchstone of modern reasonable royalty analysis”³⁹ and the “universally accepted test for reasonable royalty damages.”⁴⁰

In *Georgia-Pacific*, the court observed that “[a] comprehensive list of evidentiary facts relevant, in general, to the determination of the amount of a reasonable royalty for a patent license may be drawn from a conspectus of the leading cases.”⁴¹ The court then proceeded to enumerate “some of the fac-

of \$53,494,282. This damages amount derives from application of the jury’s unchallenged determination of a royalty rate of 0.8[%] to the legally correct royalty base.

Id.

³⁷ *Id.*

³⁸ See 318 F. Supp. 1116 (S.D.N.Y. 1970). This decision was the culmination of more than a decade of litigation. See Jarosz & Chapman, *supra* note 28, at 779–82. Although the 1970 district court decision is the most often cited decision in this line of cases, there were, in fact, a number of opinions and issues relating to this proceeding dating back to 1956. See *Georgia-Pacific Corp. v. U.S. Plywood-Champion Papers Inc.*, 446 F.2d 295 (2d Cir. 1971); *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 258 F.2d 124, 127 (2d Cir. 1958); *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 243 F. Supp. 500 (S.D.N.Y. 1965); *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 148 F. Supp. 846, 848 (S.D.N.Y. 1956).

³⁹ RICHARD F. CAULEY, *WINNING THE PATENT DAMAGES CASE 7* (Oxford Univ. Press, 1st ed. 2008).

⁴⁰ Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 629–38 (2010); see also *Lucent Techs., Inc., v. Gateway, Inc.*, 580 F.3d 1301, 1325 (Fed. Cir. 2009); *Parental Guide of Tex., Inc. v. Thomson, Inc.*, 446 F.3d 1265, 1270 (Fed. Cir. 2006); CAULEY, *supra* note 39, at 12; Bo Zeng, *Lucent v. Gateway: Putting the ‘Reasonable’ Back Into Reasonable Royalties*, 26 BERKELEY TECH. L.J. 329, 331–32 (2011); Erick S. Lee, *Historical Perspectives on Reasonable Royalty Patent Damages and Current Congressional Efforts for Reform*, UCLA J.L. & TECH., Fall 2009, at 1, 33 (referring to it as the “ubiquitous fifteen factor test”).

⁴¹ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

tors *mutatis mutandis* seemingly more pertinent to the issue[s]” in the case.⁴² The 15 factors selected by the court as being most pertinent became known as the “*Georgia-Pacific* factors.” They are:

- (1) The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.
- (2) The rates paid by the licensee for the use of other patents comparable to the patent in suit.
- (3) The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.
- (4) The licensor’s established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.
- (5) The commercial relationship between the licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter.
- (6) The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator of sales of his non-patented items; and the extent of such derivative or convoyed sales.
- (7) The duration of the patent and the term of the license.
- (8) The established profitability of the product made under the patent; its commercial success; and its current popularity.
- (9) The utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results.
- (10) The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.
- (11) The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.
- (12) The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.
- (13) The 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.
- (14) The opinion testimony of qualified experts.
- (15) The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount

⁴² *Id.* (emphasis added).

which a prudent licensee—who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention—would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.⁴³

The last of the *Georgia-Pacific* factors is a description of a commonly applied tool used to determine a reasonable royalty, which is often referred to as the “hypothetical negotiation approach”⁴⁴ or the “willing licensee/licensor approach.”⁴⁵ Under this approach, the reasonable royalty is determined based on an evaluation of what would have resulted from a hypothetical arm’s-length negotiation between a willing patent owner and a willing potential licensee of the patented invention at the point infringement is first alleged.⁴⁶ The hypothetical negotiation approach makes five assumptions:

- (1) the patent is “known to be valid” and enforceable “at the time infringement commences”;
- (2) the patent is known to be infringed;
- (3) the patent holder “is willing to issue a license”;
- (4) the licensee is “willing to take a license”; and
- (5) the appropriate “relevant business facts” (even subsequent to the point of negotiation) “are deemed known to both parties.”⁴⁷

The hypothetical negotiation approach can be a very useful tool for courts to analyze reasonable royalty damages because it provides an intuitive way to think about such damages. In relying on this approach, however, it is important to remember that this framework is simply a tool designed to assist a court in determining the damages adequate to compensate a patent holder for the infringement of its patent and that “[hypothetical negotiation] approach must be flexibly applied as a ‘device in the aid of justice,’”⁴⁸ where “justice” refers to providing adequate compensation to the patent holder for the infringement.⁴⁹

⁴³ *Id.* at 1120–21.

⁴⁴ See Butler, *supra* note 19, § 4.01.

⁴⁵ See JOHN SKENYON ET AL., PATENT DAMAGES LAW & PRACTICE § 1.14 (Thomas Reuters 2014).

⁴⁶ See Colleen Chien & Eric Schulman, *Patent Semi-Comparables*, 25 TEX. INTELL. PROP. L.J. 216, 222 (2018).

⁴⁷ Paul M. Janicke, *Contemporary Issues in Patent Damages*, 42 AM. U.L. REV. 691, 722–24 (1993).

⁴⁸ TWM Mfg. Co. v. Dura Corp., 789 F.2d 895, 900 (Fed. Cir. 1986) (citing Cincinnati Car Co. v. New York Rapid Transit Corp., 66 F.2d 592, 595 (2d Cir. 1933)).

⁴⁹ See Procter & Gamble Co. v. Paragon Trade Brands, Inc., 989 F. Supp. 547, 600 (D. Del. 1997).

B. Apportionment

“Apportionment,” in the context of patent damages, refers to the fact that a patent holder’s recovery (*i.e.*, patent infringement *damages*) should be based on the economic value contributed by the use of the patented issue, and should not include the economic value generated by other contributors of value (*e.g.*, other patents, infringer know-how, infringer business capabilities, *etc.*).⁵⁰ As explained by Damien Geradin and Anne Layne-Farrar:

The apportionment principle seeks to ensure that the damages awarded to the patentee are proportionate to the contribution of its invention to the infringing product, and not based on any value attributable to the infringer’s or third parties’ inventions.⁵¹

Simply put, apportionment is used in patent infringement cases as a means of limiting damages to the economic footprint of the asserted technology and excluding value generated by non-patented (or other-patented) contributing factors.⁵²

1. Origins

The importance of apportionment in the analysis of patent damages can be traced back to 1884, when the Supreme Court opined in *Garretson v. Clark*⁵³ (a case involving an improvement in the construction of mop-heads):

The patentee . . . must in every case give evidence tending to separate or apportion the defendant’s profits and the patentee’s damages between the patented feature and the unpatented features, and such evidence must be reliable and tangible, and not conjectural or speculative; or he must show, by equally reliable and satisfactory evidence,

⁵⁰ Bensen & White, *supra* note 1, at 3–4.

⁵¹ Geradin & Layne-Farrar, *supra* note 1, at 769.

⁵² Layne-Farrar, *supra* note 1, at 1; see Intell. Prop. Owners Ass’n, *Apportionment in Determining Reasonable Royalty Damages: Legal Principles, Practical Considerations and Countervailing Viewpoints* 10 (Dec. 18, 2018), <https://www.ipo.org/wp-content/uploads/2019/01/Damages-committee-white-paper-1.pdf> [<https://perma.cc/9R9M-M4F8>] (“[T]he law requires apportioning between patented and unpatented features to ensure that the damages award fairly represents the footprint of the invention, and no more.”).

⁵³ 111 U.S. 120 (1884). The *Garretson* case followed two other apportionment-related Supreme Court cases. See *Seymour v. McCormick*, 57 U.S. 480, 489, 491 (1854) (“[I]t is a very grave error to instruct a jury ‘that as to the measure of damages the same rule is to govern, whether the patent covers an entire machine or an improvement on a machine’” and “one who invents some improvement in the machinery of a mill could not claim that the profits of the whole mill should be the measure of damages for the use of his improvement.”); *Livingston v. Woodworth*, 56 U.S. 546, 560 (1853) (patent holder’s damages should be limited to “to the actual gains and profits of the appellants, . . . during the time their machine was in operation and during no other period.”). *But cf.* Risch, *supra* note 3, at 187, 229–33 (suggesting that the current application of the “apportionment” concept in reasonable royalty damages analysis is a recent development: “Apportioning the royalty base to a lower amount was a concept that was essentially foreign to legal scholarship until 2005”).

that the profits and damages are to be calculated on the whole machine, for the reason that the entire value of the whole machine, as a marketable article, is properly and legally attributable to the patented feature.⁵⁴

Although the Court was reviewing a different statute covering patent infringement damages in *Garretson*,⁵⁵ courts have cited its fundamental principle that patent damages should reflect the contribution of the patent in modern cases in support of the requirement that *patent damages awards* must reflect the *contributions of the patented technology at issue* and not value generated by other contributors of value.⁵⁶

2. Essentiality

Apportionment is an essential element of the determination of reasonable royalty damages, especially for multi-component accused products, because a patent holder is not entitled to compensation beyond the value generated by the use of the patented technology.⁵⁷ As the court explained in *Ericsson, Inc. v. D-Link Systems, Inc.*:

As a substantive matter, it is the “value of what was taken” that measures a “reasonable royalty” under 35 U.S.C. § 284 What is taken from the owner of a utility patent (for purposes of assessing damages under § 284) is only the patented technology, and so the value to be measured is only the value of the infringing features of an accused product.⁵⁸

In other words, reasonable royalty damages should be based on the incremental value generated by the use of the relevant patented technology.

Given this requirement, reasonable royalty damages analyses involving multi-component accused products involving multiple contributors to product value must include *some* form of apportionment analysis, even though the elements of this analysis depend on the details of each specific case.

3. Components of Apportionment Analysis

The process of apportioning for incremental value associated with patent infringement typically involves three distinct, but interdependent, components: (1) the selection of a *royalty base*; (2) the selection of the *royalty rate*; and (3) an *evaluation of a negotiation* between a willing buyer and willing seller to determine the level of damages needed to “adequately compensate the

⁵⁴ *Garretson*, 111 U.S. at 121 (emphasis added) (citing *Garretson v. Clark*, 10 F. Cas. 40, 41 (N.D.N.Y. 1878)).

⁵⁵ See John Dubiansky, *A Competition Perspective on Apportionment of Patent Infringement Remedies* 3 (May 2016), <https://www.competitionpolicyinternational.com/wp-content/uploads/2016/05/North-America-Column-Full.pdf> [<https://perma.cc/K39V-LWBV>].

⁵⁶ See *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1337 (Fed. Cir. 2009); see also *Commonwealth Sci. Indus. Research Org.*, 809 F.3d 1295, 1301 (Fed. Cir. 2015).

⁵⁷ See *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014).

⁵⁸ *Id.* (citing *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 648 (1915)).

patent holder for the infringement of the relevant patent.”⁵⁹ As the Federal Circuit explained in *Ericsson, Inc. v. D-Link Systems, Inc.*:

When the accused infringing products have both patented and unpatented features, measuring this value requires a determination of the value added by such features Logically, an economist could do this in various ways—by careful selection of the *royalty base* to reflect the value added by the patented feature, where that differentiation is possible; by adjustment of the *royalty rate* so as to discount the value of a product’s non-patented features; or by a *combination thereof*.⁶⁰

Unlike the royalty base and the royalty rate, the hypothetical negotiation is not a “building block” of the damages calculation; it is the framework used to synthesize all of the relevant information in the case to enable the fact-finder to determine the reasonable royalty damages that would adequately compensate the patent holder for the unauthorized use of the patented technology at issue.⁶¹ From the perspective of apportionment, the hypothetical negotia-

⁵⁹ Max Colice & Britton Davis, *Claim Scope and Apportionment At Fed. Circ.*, LAW360 (Feb. 27, 2018, 12:20 PM), <https://www.law360.com/articles/1014869> [<https://perma.cc/247G-J7MB>]. The authors write:

There are many ways to apportion damages. For instance, the patent owner can apportion damages using the Georgia-Pacific factors, which try to capture a hypothetical negotiation between the patent owner and the infringer. The patent owner can also reduce the royalty base to the smallest salable patent-practicing unit. If the smallest salable patent practicing unit includes unpatented features, the royalty base may be discounted further to reflect the value of the unpatented features. Similarly, if a patent claim recites both inventive and conventional elements, the court should discount the reasonable royalty based on the value of the conventional elements apart from the inventive ones.

Id. (internal citations omitted).

⁶⁰ *Ericsson, Inc.*, 773 F.3d at 1226 (internal citations omitted); see also *Sprint Commc’ns Co. v. Time Warner Cable, Inc.*, 760 F. App’x 977, 983 (Fed. Cir. 2019) (“[T]he objective of apportionment can be achieved in different ways, one of which is through the jury’s determination of an appropriate royalty by application of the so-called Georgia-Pacific factors.”); *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1348 (Fed. Cir. 2018). The *Exmark* court opined:

We have held that apportionment can be addressed in a variety of ways, including ‘by careful selection of the royalty base to reflect the value added by the patented feature [or] . . . by adjustment of the royalty rate so as to discount the value of a product’s non-patented features; or by a combination thereof.’ So long as Exmark adequately and reliably apportions between the improved and conventional features of the accused mower, using the accused mower as a royalty base and apportioning through the royalty rate is an acceptable methodology.

879 F.3d at 1348 (internal citations omitted).

⁶¹ Jarosz & Chapman, *supra* note 28, at 782–85. The court in *Exmark* wrote:

We hold that such apportionment can be done in this case through a thorough and reliable analysis to apportion the royalty rate. We have recognized that one possible

tion enables the fact-finder to divide the identified incremental benefits of using the patented technology between the patent holder and the infringer based on the contributions of each party to this value.⁶² It is potentially most helpful when the incremental value specifically attributable to a patent-at-issue cannot be established with precision so that a reasonable and principled basis for determining a fair allocation of benefits is needed.

II. Assessing Incremental Value

Before examining the legal decisions and rules that govern apportionment analysis in reasonable royalty damages determinations, it is important to recognize that the lodestar of reasonable royalty damages is the economic concept of “Incremental Value” (or “Incremental Benefits”). In this regard, the Federal Circuit recently explained in *Exmark Manufacturing Co. v. Briggs & Stratton Power Products Group, LLC* that, “The essential requirement is that the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product.”⁶³

The concept of “incremental value” is well-understood in economics.⁶⁴ As explained by Elizabeth Bailey, Gregory Leonard, and Mario Lopez, “Under

way to do this is through a proper analysis of the *Georgia-Pacific* factors. As we have explained, “the standard *Georgia-Pacific* reasonable royalty analysis takes account of the importance of the inventive contribution in determining the royalty rate that would have emerged from the hypothetical negotiation.”

879 F.3d at 1348–49 (internal citation omitted); see also *Ericsson, Inc.*, 773 F.3d at 1228 (noting that the *Georgia-Pacific* factors “do take the concepts of apportionment into account to some extent”).

⁶² See *Exmark Mfg. Co.*, 879 F.3d at 1348–49.

⁶³ *Id.* at 1348 (emphasis added) (citing *Ericsson, Inc.*, 773 F.3d at 1226); see also *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1311 (Fed. Cir. 2018). The court in *Finjan* stated:

Because DRTR is itself a multi-component software engine that includes noninfringing features, the percentage of web traffic handled by DRTR is not a proxy for the incremental value of the patented technology to WebPulse as a whole. Further apportionment was required to reflect the value of the patented technology compared to the value of the unpatented elements.

879 F.3d at 1311.

⁶⁴ The Incremental Benefits analysis described in this section is analogous to the “analytical” approach that was described approvingly by the Federal Circuit in *Lucent*. See *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009) (“Litigants routinely adopt several approaches for calculating a reasonable royalty. The first, the analytical method, focuses on the infringer’s projections of profit for the infringing product.”) (citing *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 899 (Fed. Cir. 1986); *id.* (describing the analytical method as “subtract[ing] the infringer’s usual or acceptable net profit from its anticipated net profit realized from sales of infringing devices”). The main difference between the traditional

a sound economic approach, the reasonable royalty award (in dollars) should reflect the incremental value (in dollars) of the patented technology to the defendant as compared to the next best alternative.”⁶⁵

This section examines the concept of incremental value in some detail and addressed practical issues in determining incremental value for use in reasonable royalty determinations.

A. Understanding Incremental Value

The term “incremental value” or “incremental benefit” refers to the additional benefits (*i.e.*, additional profits) that the infringer was able to generate by practicing the patent-at-issue in excess of what the infringer would have been able to generate if the infringer had used the next-best, non-infringing, alternative technology.⁶⁶ It can be estimated by comparing economic outcomes for the infringer in two states of the world: (1) a world in which the infringer infringed the patent-at-issue; and (2) a world in which the infringer used the next-best, non-infringing, alternative technology instead. The difference between the outcomes in these two states of the world corresponds to the incremental value or incremental benefit of practicing the patent-at-issue.

“analytic approach” and the Incremental Benefits analysis described here is that the benchmark against which infringing profits are compared in this section are the potential profit of the *next-best alternative*, while the benchmark in the traditional analytical approach are the “normal” profits earned by the infringer. See Mark Glick & David Mangum, *The Economics of Reasonable Royalty Damages: The Limited, Proper Role of the So-Called “Analytical Method”*, 49 J. MARSHALL L. REV. 1, 4–14 (2015).

⁶⁵ Bailey et al., *supra* note 1, at 259; see also Chien & Schulman, *supra* note 46, at 217. (“One of the hardest problems in patent law is how to determine adequate compensation for the infringement of a patent when the infringing product incorporates many other inventions Royalty awards must be based ‘on the *incremental* value of the invention.’”) (citing *Ericsson, Inc.*, 773 F.3d at 1235).

⁶⁶ Glick & Mangum, *supra* note 64, at 26–27. The authors state:

[T]he goal of any damages analysis should be to isolate the impact of infringement by measuring the difference between the profits made by the infringer with the infringement, over what profit the infringer would have made had it not infringed and instead selected the next best substitute for the infringing technology.

Id.; see also Bailey et al., *supra* note 32, at 120 (“The reasonable royalty analysis should seek to determine the economic value generated by the patented feature relative to the next best (non-infringing) alternative.”); Thomas F. Cotter, *Four Principles for Calculating Reasonable Royalties in Patent Infringement Litigation*, 27 SANTA CLARA COMPUT. & HIGH TECH L.J. 725, 743 (2011); Jarosz & Chapman, *supra* note 28, at 813.

1. *Next-Best, Non-Infringing, Alternative Technology*

To estimate the incremental value of a given patent, one must identify the next-best, non-infringing, alternative technology to the patent in question.⁶⁷ To identify this alternative, the question to be answered is: “What would the infringer have done if the infringer had not practiced the patented technology at issue?”⁶⁸

In any given case, the determination of the infringer’s next-best, non-infringing alternative requires a case-specific inquiry to identify the alternatives

⁶⁷ In the case of reasonable royalty damages, the next-best, non-infringing alternative refers to the next best option that the infringer could have pursued as an alternative to using the patented technology. In this context, the focus is on profits that could have been realized by the infringer in the absence of infringement, and the next best alternative need not be a commercially acceptable substitute to the accused product. *See Salazar v. HTC Corp.*, 2:16-CV-01096-JRG-RSP, 2018 WL 2033709, at *5–6 (E.D. Tex. Mar. 28, 2018). In *Salazar*, the court opined:

The concept of an ‘acceptable non-infringing alternative’ relates to a lost-profits damage model. To recover lost profits, the patentee must show a “reasonable probability that, ‘but for’ infringement, it would have made the sales that were made by the infringer That, in turn, requires the patent owner to prove an absence of ‘acceptable’ non-infringing substitutes And although there are no bright-line rules for deciding ‘acceptability’ of a non-infringing substitute, if the patent owner shows consumers specifically want devices with certain advantages, non-infringing alternatives cannot be “acceptable” without those advantages But ‘acceptable non-infringing alternatives’ don’t play the same role in a reasonable-royalty determination. Rather, courts consider the next-best available alternative, which is not necessarily an ‘acceptable’ alternative that precludes recovery of lost profits under *Panduit*.

Id. at *5–6 (internal citations omitted).

⁶⁸ The legal and economic communities have acknowledged the value of such an examination to the assessment of reasonable royalty damages. *See* Thomas F. Cotter et al., *Reasonable Royalties*, in *PATENT REMEDIES AND COMPLEX PRODUCTS: TOWARD A GLOBAL CONSENSUS* 6, 17 (C. Bradford Biddle et al. eds., 2019) (“[E]conomists generally accept ‘incremental value’—that is, the difference between the value derived from the patented invention over the next best available non-infringing alternative—as an accurate measure of the value of patented technology.”); *see also* Bailey et al., *supra* note 1, at 259; Roy J. Epstein & Paul Malherbe, *Reasonable Royalty Patent Infringement Damages After Uniloc*, 39 *AIPLA Q.J.* 3, 28, 29 (2011); Durie & Lemley, *supra* note 40, at 638; Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 *J. CORP. L.* 101, 133–34 (2009); Mark A. Lemley & Carl Shapiro, *Patent Hold-Up and Royalty Stacking*, 85 *TEX. L. REV.* 1991, 2000, 2039 (2007); Christine Meyer & Bryan Ray, *A Critique of Noneconomic Methods of Reasonable Royalty Calculation*, in *ECONOMIC APPROACHES TO INTELLECTUAL PROPERTY POLICY, LITIGATION, AND MANAGEMENT* 83 (Lauren Stiroh et al. eds., 2005); Roy J. Epstein & Alan J. Marcus, *Economic Analysis of the Reasonable Royalty: Simplification and Extension of The Georgia Pacific Factors*, 85 *J. PAT. & TRADEMARK OFF. SOC’Y* 557–58 (2003); *FED. TRADE COMM’N*, *supra* note 23, at 185–87.

to practicing the patented technology that may have been available. Such alternatives could involve the simple elimination of a patented improvement or patented feature from the accused product, the substitution of functionality that is similar to the patented functionality but is non-infringing, use of a non-patented production process, or any other alternative that enables the infringer to offer a product that is an alternative to the infringing product without practicing the patent-at-issue. In practice, the determination of the next-best, non-infringing, alternative technology can be a complex exercise, requiring not only technical expertise to identify available, non-infringing technology options, but also economic and/or business expertise to assess the degree to which a non-infringing product would represent an economically viable alternative to the infringing product.⁶⁹

2. Sources of Incremental Value

An infringer derives economic value from using a patented technology when it earns higher profits by using the patented technology than would have been earned without it. Patents can generate incremental benefits in many different ways. In some cases, for example, an infringer may use the patent to make an existing product more attractive to consumers (*e.g.*, by adding new features to an existing product and/or enhanced performance of existing features or an existing product), enabling the infringer to charge higher prices and/or sell more units than it otherwise would have. In some cases, an infringer may use the patented technology to facilitate the creation and introduction of a new product in the marketplace. In some cases, an infringer may use the patented technology to lower the cost of manufacturing the accused product—increasing infringing profits by lowering the costs associated with producing the products.

In all cases, a critical focus of an Incremental Benefits analysis is the identification and measurement of the *added profits* that infringement generates compared to the next-best, non-infringing alternative.

3. Types of Incremental Value

For the purpose of discussing infringement-related value creation, it is useful to identify two distinct forms of value creation: (1) “Direct” value creation; and (2) “Indirect/Synergistic” value creation. For the analysis of reasonable royalty damages, this distinction is important because the nature

⁶⁹ See, *e.g.*, *Presidio Components, Inc. v. Am. Technical Ceramics Corp.*, 875 F.3d 1369, 1381 (Fed. Cir. 2017), *cert. denied*, 139 S. Ct. 144 (2018); *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1353–55 (Fed. Cir. 1999) (indicating that the patentee may prove either that the potential alternative was not acceptable to potential customers or was not available at the time in order to demonstrate the absence of acceptable, non-infringing alternatives).

of each party's contribution to each form of incremental value is different. As discussed below, the patent holder is the primary contributor of value created directly by using the patent, but the credit for synergistically created value is shared between the parties.

In this context, "Direct" value creation refers to the additional value contributed to the accused product by the patented feature or functionality alone. This type of value is illustrated in Figure 3, which depicts the value of different components in a hypothetical, three-component accused product.

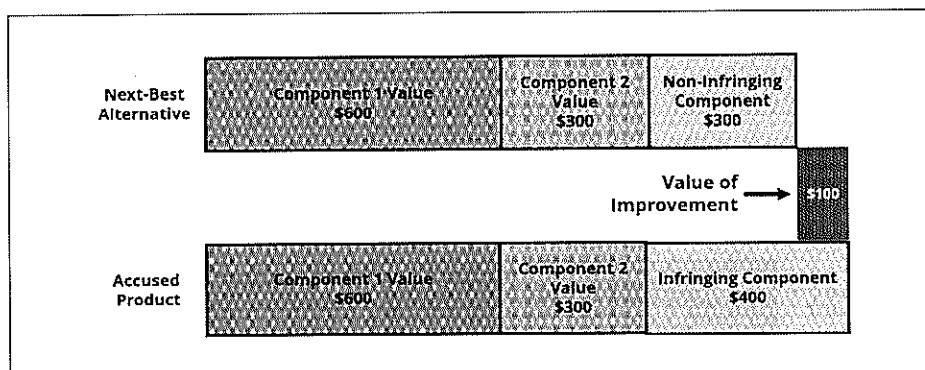


Figure 3

In Figure 3, Component 1 and 2 are the same in the Accused Product and the Next-Best Alternative, while the last component is more valuable in the Accused Product compared to the Next-Best Alternative due to the use of the patented technology. As a result of the infringement, the Accused product is \$100 more valuable than the Next-Best Alternative (due entirely to the enhanced value of the infringing component). This increase in value of the infringing portion of the Accused Product is referred to as "Direct" value creation. From the perspective of assessing patent damages, the magnitude of any damages associated with an infringement should be closely tied to the amount of Direct value creation because, by definition, this value is directly attributable to the infringing use of the patent-at-issue.⁷⁰

⁷⁰ From an economic perspective, if "Direct" value creation could be measured perfectly (*i.e.*, exclude any and all value generated by non-patented contributors), it may be reasonable to conclude that all such value should be paid to the patent holder. *See, e.g.*, Michael J. Chapman & John C. Jarosz, *REBUTTAL: It's Not an Inappropriate Reasonable Royalty Rule*, LAW360 (Aug. 21, 2015, 5:45 PM), <https://www.law360.com/articles/694171/rebuttal-it-s-not-an-inappropriate-reasonable-royalty-rule> [<https://perma.cc/S8LN-KHHY>]. *But cf.* William C. Rooklidge & Andrew T. Brown, *The Latest Inappropriate Reasonable Royalty Rule Of Thumb*, LAW360 (July 28, 2015, 10:10 AM), <https://www.law360.com/articles/683481/the-latest-inappropriate-reasonable-royalty-rule-of-thumb> [<https://perma.cc/CYV7-YT7L>]. In practice, however, it is rare to be able to isolate the contribution of patented technology

In addition to Direct value creation, the use of patented technology can often result in “Indirect/Synergistic” value creation. Indirect/Synergistic value creation is the result from the interaction of the patented and non-patented components, which that enables the value of the combined product to exceed the sum of its parts.⁷¹ As explained by Gregory Sidak:

The complementarity effect among individual technologies increases the value of other features of the downstream product. Each implemented patented component has value by itself, but the interaction among the multiple patented technologies adds additional value to the entire downstream product.⁷²

For example, a patent that enables a longer-lasting smart phone battery makes the battery itself more valuable than a non-infringing battery, while, at the same time, increasing the value of phone and camera functionalities by increasing the time that those functions can be used. Figure 4 illustrates Indirect/Synergistic value creation.

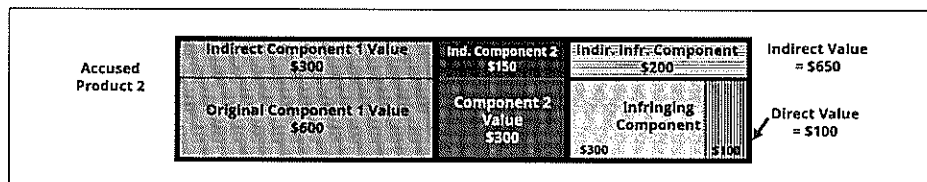


Figure 4

In Figure 4, the combination of the Infringing Component with the original Component 1 and Component 2 is assumed to increase the value of each component by 50%. As a result, the value created by using the patented technology includes not only the Direct increase in value of the last component by \$100 (discussed above), but also the creation of \$650 in Indirect/Synergistic value (which consists of \$300 in Indirect/Synergistic value for Component 1, \$150 for Component 2, and \$200 for the Infringing Component).

In considering Figure 4, two points should be highlighted. First, in the real world, the degree of Indirect/Synergistic value generated is not likely to

perfectly. Therefore, in most circumstances, the Direct value creation amount serves as an upper bound on the amount that should be awarded as damages.

⁷¹ As the Federal Circuit explained in *AstraZenica AB v. Apotex Corp.*:

[T]he standard *Georgia-Pacific* reasonable royalty analysis takes account of the importance of the inventive contribution in determining the royalty rate that would have emerged from the hypothetical negotiation. However, while it is important to guard against compensation for more than the added value attributable to an invention, *it is improper to assume that a conventional element cannot be rendered more valuable by its use in combination with an invention.*

782 F.3d 1324, 1338 (Fed. Cir. 2015) (emphasis added).

⁷² Sidak, *supra* note 1, at 994–95; see also Bailey et al., *supra* note 1, at 260–62.

be uniform across all components in the multi-component product, because some non-patented aspects of the infringing product may be more closely related to or dependent on the patented technology than others (e.g., the value of video streaming on a smart phone may be enhanced more from an improved battery than the value of the camera). The extent of such benefits across the various components of the accused product is an issue that should be examined (to the extent possible) in assessing the Indirect/Synergistic value generated by using the patented technology in the analysis of reasonable royalty damages.

Second, even the component that includes Direct incremental value from the use of the patented technology on a stand-alone basis can benefit from an increase in Indirect/Synergistic value when combined with the other components in the accused product. In such cases, if an infringer sells this component in the marketplace, then the “market” price for this component is likely to under-represent the *value of using* the patented technology *in the accused product*.

The existence of Indirect/Synergistic value creation creates particular challenges for assessing patent infringement damages because both the patent holder and the infringer share credit for this value creation.⁷³ Accordingly, *some* rationale is needed in such cases to establish a fair allocation of these benefits between the parties. As discussed below, consideration of the *Georgia-Pacific* factors often informs the allocation of credit between the parties.

B. Calculating Incremental Value

Although the general concept of incremental value is relatively simple and straight-forward, the isolation and quantification of such value can be a challenge in many patent infringement cases given the data that are available.⁷⁴ Under ideal circumstances, it may be possible to directly measure the incremental value associated with infringement with a high degree of certainty. In most cases, however, the incremental value of using the patented technology must be estimated based on limited data.

1. Natural Experiment

When the infringer sells a product that is *identical* to the infringing product in all respects *except for the inclusion of the patented technology*, the identification and quantification of incremental benefits can be fairly straight-forward.

⁷³ Thomas F. Cotter, *Patent Damages Heuristics*, 25 TEXAS INTELL. PROP. L.J. 159, 202 (2018) (noting that there is some disagreement among commentators whether the patent owner should share in the synergistic benefits); *see also* Cotter *et al.* (2019), *supra* note 68, at 23–25.

⁷⁴ *See* Jarosz & Chapman, *supra* note 28, at 814–15.

In such a natural experiment, the difference in financial performance of the two products provides a direct measure of the value of the “use [of the patent] made of the invention by the infringer” that should be the foundation of a patent damages award.⁷⁵ For example, consider a patented technology that permitted the manufacturer to make and sell purple widgets for the first time after having made and sold red widgets for years before. Assume that using the patented technology did not change the costs of production, but did increase the sales price of the infringing purple widgets above non-infringing red widgets such that purple widgets generated a profit rate of 25.0% of net revenues while red widgets generated a profit rate of 20.0% of net revenues. Under these circumstances and assuming no change in volume, the infringer generated incremental profits of 5.0% of net revenues for the accused products by using the patented technology. This suggests that the reasonable royalty for the infringement of the “purple patent” is *up to* 5.0% of net revenues of infringing widgets.⁷⁶

2. Multi-Component Product

In cases where no such natural experiment is available or where the accused product is more complex (*e.g.*, involves a substantial number of contributing factors in addition to the patent-at-issue), the isolation and quantification of the incremental value of using the patented technology can be much more difficult to reliably and accurately determine for a variety of reasons.⁷⁷

⁷⁵ Chapman & Jarosz, *supra* note 70. Depending on the circumstances, a payment equivalent to that difference would allow a patent holder to be fully compensated for its contribution (*i.e.*, the patented invention) to the infringing product, yet still allow the infringer a normal return associated with its own contributions. In fact, if properly computed (*i.e.*, non-patented contributions are perfectly excluded and there are no Indirect/Synergistic benefits), it could represent *the* payment. *See, e.g., id.* However, in most cases, this difference represents the *maximum* amount of payment because non-patented contributions cannot be perfectly eliminated from incremental value. *See* Durie & Lemley, *supra* note 40, at 639 (“The defendant is being sued because it, not the patentee, actually built the infringing product. As a result, the defendant likely contributed in part to the success of the patented technology as it is being sold, by paying to manufacture and market it or by bundling it with the defendant’s own technological contributions.”); FED. TRADE COMM’N, *supra* note 23, at 185.

⁷⁶ The specific allocation of the 5.0 percent incremental value increase between the patent holder and the infringer is likely to be determined in a hypothetical negotiation. It is worth noting that estimated royalty rate is a percentage of *total* widget revenues—which would represent an application of the EMVR if widget are multi-component products. From an economic perspective, this royalty rate benchmark/upper bound is appropriate, even in the absence of a showing that widget color is the driver of demand for widgets as a whole.

⁷⁷ *See* Chien & Schulman, *supra* note 46, at 217 (“One of the hardest problems in patent law is how to determine adequate compensation for the infringement of a patent when the

One common reason that accurate estimation of the incremental value of the use of a patent can be challenging in the absence of a “natural experiment” is the uncertainty concerning the likely profitability of adopting the next-best non-infringing alternative. In situations where the next-best, non-infringing alternative is a product that *could have* been made and sold in the marketplace but was never actually sold, determination of the likely profitability of the next-best, non-infringing alternative at the time that the infringement began must be estimated based on the information that is available in the litigation. Depending on the nature and extent of available information, the degree of accuracy and reliability of the estimated profitability on the non-infringing alternative may be limited, which, in turn, limits the accuracy and reliability of any estimate of the incremental value of the patented technology that is calculated using this estimate.

Even in cases where reliable data concerning the profitability of a next-best, non-infringing alternative are available, isolating the incremental value of the patented technology can be challenging for complex, multi-component accused products, particularly where sufficiently detailed economic data are unavailable and/or where the patented technology accounts for only a portion of all value/profits generated by the accused products. Whether and how such isolation may be achieved depends on the nature and extent of data that are available.

In situations where multiple versions of the accused product are sold, some of which include the patented technology and some of which do not, it may be possible to isolate and estimate the incremental value of the patented technology using economic modeling and/or tools such as conjoint analysis, hedonic pricing analysis, or consumer surveys⁷⁸—tools that may be able to disaggregate the contributions of the various contributors of value to the overall product (depending on the nature and amount of sales data that are

infringing product incorporates many other inventions . . . Royalty awards must be based ‘on the *incremental* value of the invention . . .’) (internal citations omitted).

⁷⁸ See David Franklyn & Adam Kuhn, *The Problem of Mop Heads in the Era of Apps: Toward More Rigorous Standards of Value Apportionment in Contemporary Patent Law*, 98 J. PAT. & TRADEMARK OFF. SOC’Y 182, 219 (2016) (discussing conjoint consumer surveys—which ask respondents to choose between iterations of products with different feature combinations and price—to determine the value of a particular feature).

available).⁷⁹ In short, if the data permit the reliable use of such tools,⁸⁰ it may be possible to directly estimate the contributions of the patented technology to the overall accused product.

Even in circumstances where economic modeling permits the estimation of the incremental benefits *associated with* the use of the patented technology, further analysis is often required in matters involving complex, multi-component products to isolate the incremental benefits specifically *attributable to* the patented technology, because the incremental benefits derived from the economic models or econometric analysis or comparable licenses may cover more than the patented technology alone. For example, econometric analysis may be able to provide a reliable estimate of value of a *specific feature* of a smart phone, but unless the patent-at-issue is solely responsible for making that feature possible, further analysis may be required to separate the specific incremental value contributed by the patented technology from the incremental value contributed by other contributors of value to the smart phone (*e.g.*, other patents, know-how, manufacturing capabilities, *etc.*). The specific tools that may be used to accomplish this disaggregation of value (*e.g.*, assessing the relative value of different patents) will vary depending on the evidence available each matter.⁸¹

C. Using Incremental Value in Determining Reasonable Royalty Damages

Estimation of the incremental value attributable to the patented technology can be a critical step in meeting the “essential requirement . . . that the ultimate reasonable royalty award must be based on the *incremental value that the patented invention adds to the end product.*”⁸² For the purposes of

⁷⁹ See J. Gregory Sidak & Jeremy O. Skog, *Hedonic Prices and Patent Royalties*, 2 J. ON INNOVATION 601, 601 (2017); see also J. Gregory Sidak & Jeremy O. Skog, *Using Conjoint Analysis to Apportion Patent Damages*, 25 FED. CIR. B.J. 581, 581 (2016); Jake Holdreith et al., *Using Regression Models to Isolate the Value of a Patented Feature*, IAM MAG., May/June 2013, at 19, 19, 22–24, <https://www.iam-media.com/litigation/using-regression-models-isolate-value-patented-feature> [<https://perma.cc/4XJU-DD3B>].

⁸⁰ Reliable use of econometric analysis depends on the availability of data on such variables as sales volumes for different products, pricing of relevant products, the costs of production for relevant products, the characteristics of the different products sold, and the like. These data are used to estimate the extent to which pricing, sales, costs, and other variables concerning accused products tend to vary based on the characteristics of the products in question. These results can be used to ascertain the incremental benefits associated with the patented technology.

⁸¹ See Geradin & Layne-Farrar, *supra* note 1, at 778–84.

⁸² *Exmark Mfg. Co. v. Briggs & Statton Power Prods. Grp., LLC*, 879 F.3d 1332, 1348 (Fed. Cir. 2018) (emphasis added) (citing *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201,

understanding existing rules concerning apportionment, two issues should be highlighted. The first issue involves the selection of the royalty base to be used in the analysis, which has received substantial attention from courts in recent years. The second issue involves careful consideration of relationship between the incremental value attributable to the use of the patented technology and the reasonable royalty damages awarded for infringement. Simply put, the apportionment process is intended to ensure that reasonable royalty damages are consistent with incremental value creation.

1. Selection of Royalty Base

The first issue that should be highlighted is that the selection of the appropriate royalty base (*i.e.*, SSPPU *v.* entire market value of accused product) to be used in assessing incremental value is an *empirical question* whose answer depends on the details and evidence of each specific case.

In some cases, the most accurate and available evidence on sales prices and quantities will be at the accused product level (*i.e.*, the full value of the accused product)—making overall product sales the most practical and appropriate royalty base to use in the analysis of incremental value, even if the patented technology cannot reasonably be considered to satisfy the requirements of the EMVR. In fact, as a practical matter, evaluating incremental value of a patented technology at the overall product level is likely to be *preferred* from an economic perspective in instances where there is substantial Indirect or Synergistic value creation, because using a broader royalty base under those circumstances reduces the chances that Indirect value generated by the infringement will be unintentionally excluded from a reasonable royalty damages award.

At the same time, using the entire market value of the infringing product as a royalty base in cases involving complex, multi-component products may substantially increase the complexity of the economic modelling exercise needed to assess damages by increasing the number of potential contributors of value to the accused product. This increased complexity may reduce the degree of accuracy or reliability of the incremental value that is estimated for the patented technology, particularly if the patented technology is a relatively minor feature in the overall product whose overall impact on total accused value is minimal.⁸³ In that situation, a narrower royalty base (*i.e.*, the SSPPU) with fewer contributors to incremental value besides the patented technology

1226 (Fed. Cir. 2014)).

⁸³ At minimum, the use of the larger royalty base in these circumstances increases the importance of finding the appropriate royalty rate, because small errors in the royalty rate will translate into large errors in damages when multiplied by the large royalty base.

may yield a more reliable estimate of the incremental value of the patented technology.

In short, the selection of the appropriate royalty base for use in an economic assessment of the incremental value of the patented technology depends fundamentally on the nature of the data that are available and the accuracy of the estimate that can be derived from the analysis, rather than the legal definitions and constraints imposed by the SSPPU principle or the EMVR.

2. Incremental Value and the Hypothetical Negotiation Construct

A second important issue concerning the relationship between an economic assessment of the incremental value contributed by the patented technology and the determination of reasonable royalty damages is the extent to which further analysis (in particular, consideration of a hypothetical negotiation) may be needed to establish reasonable royalty damages even after a careful incremental value analysis has been completed. In this regard, further analysis is typically required even after the completion of an economically rigorous incremental value analysis in order to accurately assess reasonable royalty damages associated with patent infringement for, at least, two reasons.

First, even the most careful incremental benefits analysis will typically fail to completely isolate the incremental value of the patented technology from the incremental value of non-patented contributors of incremental value—particularly in the case of complex, multi-component accused products because the economic footprint of the patented technology rarely corresponds perfectly with the feature or element of the infringing product whose value can be measured.⁸⁴ To the extent that the value cannot be completely isolated, some adjustments may be needed to the estimated incremental value of the patented technology to ensure that the patent holder's compensation is limited to the contributions associated with the use of the patented technology (*i.e.*, the incremental value generated by using the patented technology alone).

Second, even if the incremental value *associated with* the use of the patented technology could be calculated perfectly, further analysis may still be needed to determine reasonable royalty damages if any portion of the estimated value *associated with* the use of the patented technology takes the form of Indirect/Synergistic value created by the combination and/or interaction of the patented technology and the rest of the contributors of value to the accused product. To the extent that Indirect/Synergistic value is generated by using the patented technology, the patent-related incremental value should be divided between the patent holder and the infringer because the

⁸⁴ See David J. Teece & Edward F. Sherry, *On the "Smallest Saleable Patent Practicing Unit" Doctrine: An Economic and Public Policy Analysis*, WORKING PAPER SERIES NO. 11 6 (2016), <https://ssrn.com/abstract=2764614> [<https://perma.cc/MDJ8-ABHK>].

contributions of both are reflected this value. As explained by Mark Glick and David Mangum:

[T]he most accurate measure of the impact of infringement is to . . . directly measure the incremental profits from the infringement. This is properly measured as the difference between the profits made by the infringer with the patented invention less the profits the infringer would have made had it selected the next best substitute for the infringing technology. Once this adjustment is made, however, it becomes . . . [an] estimate [of] the upper bound of what the infringer would be willing to pay in the traditional, hypothetical willing licensor/willing licensee negotiation at the time of infringement.⁸⁵

In principle, the full incremental value generated by infringement should be divided between the patent holder and the infringer relative to their respective contributions to generate this value.

As a general matter, the *Georgia-Pacific* factors can be used to determine how such value should be allocated between the parties to ensure that the patent holder is adequately compensated for the unauthorized use of the patented technology.⁸⁶

III. Apportionment in Reasonable Royalty Damages Determinations

Although rigorous economic analysis can be very useful in many cases for providing quantitative evidence to meet “[t]he essential requirement is that the *ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product[,]*”⁸⁷ the ability to undertake a sufficiently detailed analysis of incremental value to meet this requirement is often limited in patent infringement cases due, for example, to a lack of the necessary data to definitively isolate the incremental value of the patented technology. Even in such circumstances, however, reasonable royalty damages in patent infringement cases are expected to reflect the

⁸⁵ Glick & Mangum, *supra* note 64, at 38.

⁸⁶ Some commentators have argued that apportionment of synergy-related value is likely to be arbitrary because there is no unique way or mechanical rule guide such an allocation. See Bailey et al., *supra* note 1, at 262. Although there is an element of truth to this observation, the Federal Circuit has recognized that reasonable royalty damages “analysis necessarily involves an element of approximation and uncertainty” and simply requires that “a trier of fact must have *some factual basis* for a determination of a reasonable royalty.” *Unisplay S.A. v. Am. Elec. Sign Co.*, 69 F.3d 512, 517 (Fed. Cir. 1995) (emphasis added). At minimum, using an accurate estimate of the incremental value of using the patented technology as the basis for the analysis ensures that any allocation of value between the parties that can be tied to the facts of a given case is likely to provide juries with a foundation for a reasonable damages determination.

⁸⁷ *Exmark Mfg. Co.*, 879 F.3d at 1348 (citing *Ericsson*, 773 F.3d at 1226) (emphasis added).

incremental value of the patented technology at issue, and the courts have developed a variety of apportionment rules that are used to guide and evaluate the analysis of such damages.⁸⁸

In effect, the apportionment rules developed by the courts can be considered “guard rails” for patent damages analysis that are intended to constrain such analyses to increase the expected reasonability of patent damages awards, recognizing that reasonable royalty damages analysis “necessarily involves an element of approximation and uncertainty” and that “a trier of fact must have *some factual basis* for a determination of a reasonable royalty.”⁸⁹ Under these circumstances, a natural question to ask is: Do the apportionment rules developed by the courts increase the likelihood that reasonable royalty damages awards reflect the incremental value generated by using the technology at issue?

In addressing this question, there are a number of criteria that could be used to evaluate the effectiveness of the courts’ rules concerning apportionment, such as: (1) “Do the apportionment rules articulated by the courts make it more likely to generate *reliable and objectively reasonable estimates of value* for the relevant accused products and/or components that are grounded in the facts of the case and that can provide a reasonable foundation for the assessment of damages?”; (2) “Are the apportionment rules articulated by the courts effective in establishing a *reasonable and appropriate ceiling or upper bound on reasonable royalty damages* by eliminating (or, at least, minimizing) the extent to which value generated by other contributors of value are included in the damages analysis?”; and (3) “Are the apportionment rules articulated by the courts effective in establishing a *reasonable and appropriate floor or lower bound on reasonable royalty damages* by ensuring that all incremental value attributable the use of the patented technology is considered in establishing reasonable royalty damages?” An additional consideration is whether the apportionment rules established by the courts provide sufficient safeguards to prevent juries from being misled by exposure to evidence that may tend to artificially inflate or depress damages awards.⁹⁰

⁸⁸ *Id.*

⁸⁹ *Unisplay S.A.*, 69 F.3d at 517 (emphasis added); see also Cotter, *supra* note 73, at 163–64 (discussing the need for courts to adopt heuristics in assessing patent damages in order to balance the desire for precision and accuracy in patent damages with the costs and obstacles of performing detailed calculations); Risch, *supra* note 3, at 241 (“Thus, the entire market value rule and its concomitant royalty base apportionment are proxies for a different concern: that royalty rates (or even per-unit royalties) simply do not reflect the value of the invention.”) (citation omitted).

⁹⁰ See David Kappos & Paul R. Michel, *The Smallest Salable Patent-Practicing Unit: Observations on Its Origins, Development, and Future*, 32 BERKELEY TECH. L.J. 1433, 1439–40 (2018).

As shown below, the different apportionment rules articulated by the courts perform differently against each of these standards, and there is no single rule that performs the best against all these criteria. Moreover, the extent to which any one of these standards is met in any given case depends heavily on how the courts' rules are applied in each specific case. Accordingly, consideration of these standards provides a framework for assessing what apportionment rules and approaches are appropriate in any given case—premised on the assumption that the ultimate objective of the apportionment process should be to approximate and/or be consistent with the incremental value attributable to the use of the patented technology in that case.

A. Importance of Royalty Base-Royalty Rate Conformity

Although the apportionment of the royalty base and royalty rate are often discussed separately in court decisions (and will be discussed separately in Parts III.B and III.C below), it is important to recognize and emphasize that the assessment of *reasonable royalty damages* fundamentally depends on the *interaction of the relevant royalty base and the royalty rate*. If the royalty base and royalty rate do not conform to one another, the resulting mis-matched damages calculation is likely to provide little or no useful guidance for the accurate determination of damages.

As a practical matter, this interdependence suggests that the analysis of the royalty base and royalty rate should be considered sequentially (*i.e.*, with one of these variables being evaluated as *conditional on* decisions that have already been made concerning the other). In most cases, the selection of the royalty base is the first step in the analysis of reasonable royalty damages, and the analysis of the appropriate royalty rate is undertaken *conditional on the royalty base that has been selected*. In effect, the question in the second stage of the analysis is: Does this royalty rate reasonably reflect the incremental value *to the selected royalty base* of the use of the patented technology? If so, that combination of royalty base and royalty rate is likely to result in appropriate reasonable royalty damages. If the royalty rate *is not consistent* with the selected royalty base, then any damages estimate derived from multiplying these mis-matched numbers is not likely to reasonably reflect the value of using the patented technology.

Given the interdependence of the royalty base and royalty rate, it is also possible that the *royalty base* could be selected conditional on an independent assessment of the *royalty rate*. This would be the case, for example, where two parties have negotiated an arm's length license that includes a royalty rate that reflects the incremental value to the overall infringing product of using the patented technology. In that case, it would be appropriate to select the royalty base that is consistent with the parties' agreement as the basis for reasonable

royalty damages so that the combination of the royalty base and royalty rate yield payments consistent with the parties' agreement.⁹¹

B. Royalty Base

Courts typically consider two main royalty base options for the assessment of reasonable royalty damages: (1) the value of the "smallest salable patent practicing unit" or "SSPPU", or (2) the full value of the accused product.⁹² As a general matter, courts have expressed a strong preference for using the SSPPU as the royalty base for assessing patent damages since this concept was introduced in 2009 in *Cornell University v. Hewlett-Packard Co.*,⁹³ because it can provide useful discipline to ensure that reasonable royalty damages reflect (and do not exceed) the incremental value generated by infringing the patent at issue. However, courts have also identified a number of circumstances in which the more appropriate royalty base is the infringing product as a whole.

1. SSPPU

Since *Cornell University v. Hewlett-Packard Co.* introduced the concept of an SSPPU into patent law, the SSPPU has become the preferred royalty base for reasonable royalty damages (especially for multi-component accused

⁹¹ See *Commonwealth Sci. & Indus. Res. Org. v. Cisco Sys.*, 809 F.3d 1295, 1302–03 (Fed. Cir. 2015) ("Because the parties' discussions centered on a license rate for the '069 patent, this starting point for the district court's analysis already built in apportionment. Put differently, the parties negotiated over the value of the asserted patent, 'and no more.'") (quoting *Ericsson, Inc.*, 773 F.3d at 1226). Where there is no agreement between the parties, comparable agreements may be looked to in arriving at an appropriate royalty base:

A common methodology for calculating patent damages relies on evidence provided by real-life comparable license agreements, where the royalty base may not actually be apportioned. For example, a comparable license agreement may provide for a royalty on an entire machine, where only a small feature of that machine is patented. Strict application of the apportionment requirement may require creative economic analysis to determine an appropriate royalty base.

Intell. Prop. Owners Ass'n, *supra* note 52, at 5 (footnote omitted).

⁹² See *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012); see also Jonathan Putnam, *Smallest saleable patent practising unit doctrine: developments and challenges*, IAM MAG. (Oct. 17, 2017), <https://www.iam-media.com/litigation/smallest-saleable-patent-practising-unit-doctrine-developments-and-challenges> [<https://perma.cc/PZ3U-5L8K>]. The number of infringing units may also be used as a royalty base in situations where the royalty rate that is used to calculate reasonable royalty damages is a per-unit rate. See *Finjan, Inc. v. Blue Coat Sys. Inc.*, 879 F.3d 1299, 1311 (Fed. Cir. 2018).

⁹³ See *Cornell Univ. v. Hewlett-Packard Co.*, 609 F. Supp. 2d 279, 287–88 (N.D.N.Y. 2009).

products), based on the assumption that this royalty base will limit potential damages to the economic footprint of the patent.⁹⁴

The identification of the SSPPU in any given case depends on careful consideration and analysis of the case facts. For example, at the time of its introduction, the SSPPU was described as “the smallest salable infringing unit *with a close relation to the claimed invention*,”⁹⁵ and Putnam and Williams have described the SSPPU as “the most ‘upstream’ product that both practices the patent’s claims and is capable of being transacted in the market.”⁹⁶ Unfortunately, the vague nature of these definitions often does not provide clear guidance as to the specific component(s) of the accused product that should be used as the royalty base for the determination of reasonable royalty damages in any given case. In fact, in some instances the “smallest salable infringing unit” that conforms to these definitions ends up being the entire accused product (or a smaller, multi-component product) which can complicate the determination of the appropriate royalty base.⁹⁷

⁹⁴ *LaserDynamics, Inc.*, 694 F.3d at 67. The court opined:

Where small elements of multi-component products are accused of infringement, calculating a royalty on the entire product carries a considerable risk that the patentee will be improperly compensated for non-infringing components of that product. Thus, it is generally required that royalties be based not on the entire product, but instead on the “smallest salable patent-practicing unit.”

Id. (citing *Cornell Univ.*, 609 F. Supp. 2d at 283, 287–88); *see also* Sidak, *supra* note 1, at 989 (“[T]he Federal Circuit in all but exceptional cases now decidedly favors using, for purposes of the hypothetical negotiation, a royalty base equivalent to the price of the infringing product’s ‘smallest salable patent practicing component’ instead of the ‘entire market value’ of the product.”); *Intell. Prop. Owners Ass’n*, *supra* note 52, at 5 (“[I]n situations where damages are calculated by multiplying a royalty base by a rate, [a number of Federal Circuit] cases seem to require that the base represent sales attributable to the smallest salable patent practicing unit or smaller.”).

⁹⁵ *Cornell Univ.*, 609 F. Supp. 2d at 288 (emphasis added).

⁹⁶ Jonathan Putnam & Tim Williams, *The Smallest Salable Patent-Practicing Unit (SSPPU): Theory and Evidence*, Sept. 6, 2016, at 5, <https://ssrn.com/abstract=2835617> [<https://perma.cc/92V9-BRM5>].

⁹⁷ As discussed below, in cases where the SSPPU corresponds to the entire accused products, courts have sometimes required elimination of non-patented elements of the accused product from the royalty base used in the assessment of reasonable royalty damages. *See* *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1327 (Fed. Cir. 2014); *see also* *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1311 (Fed. Cir. 2018) (“[I]f the smallest salable unit—or smallest identifiable technical component—contains non-infringing features, additional apportionment is still required.”).

a. Economic Characteristics of the SSPPU

Although the courts have not provided specific guidance concerning the identification of the “SSPPU,” recognition that the royalty base should facilitate the estimation of the incremental value of using the patented technology makes it possible to identify critical characteristics of the component (or components) of a multi-component accused product that should be included in the SSPPU.

First, any component whose value is materially changed with the use of the patented technology compared to its value in the absence of use of the patented technology should be included in the SSPPU.⁹⁸ This includes any component that directly incorporates the patented technology (*i.e.*, components whose value includes Direct Incremental value). It also includes any component that benefits from a material amount of Indirect/Synergistic Incremental value. In offering this criterion, the determination that Indirect/Synergistic value is “material” will depend on the facts of each case and the rationale for including a component on this basis should be explained based on evidence in the case.⁹⁹

Second, the value (especially the incremental value associated with the use of the patented technology) of the component (or components) included in the SSPPU should be quantifiable with a reasonable degree of accuracy and reliability.¹⁰⁰ Such quantification could arise from actual market transactions involving the relevant components or from a reliable estimation process that provides an evidence-based allocation of value (and incremental value) to the patented technology.

SSPPUs that meet these criteria are likely to reflect the *economic footprint* of the patented technology that is often mentioned in conjunction with the determination of reasonable royalty damages.¹⁰¹

⁹⁸ This requirement generally captures the concepts reflected in the “Patent Practicing” portion of the SSPPU.

⁹⁹ This requirement generally captures the concepts reflected in the “Smallest” portion of the SSPPU. Some judgment may be needed for some components to determine whether the extent of incremental value is high enough relative to the value contributed by non-patented components to justify the inclusion of this component in the SSPPU.

¹⁰⁰ This requirement generally captures the concept reflected in the “Saleable” portion of the SSPPU.

¹⁰¹ *ResQNet.com v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010) (“[T]he trial court must carefully tie proof of damages to the claimed invention’s footprint in the market place.”) (citing *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999)).

b. Strengths

Assuming that the SSPPU-based royalty base is selected based on consideration of the economic footprint of the patented technology, the use of such a royalty base is likely to support the objective of having reasonable royalty damages that reflect the incremental value of the patent-at-issue.

The largest benefit of adopting such an SSPPU is that approaching the identification of the royalty base in this manner implements and operationalizes the *Garretson* requirement “to separate or apportion the defendant’s profits and the patentee’s damages between the patented feature and the unpatented features.”¹⁰² In fact, if done properly (*i.e.*, selecting a royalty base that: (1) includes all components whose value is materially changed by the use of the patented technology; (2) excludes components whose value is not materially changed by the use of the patented technology provides; and (3) permits for reliable quantification of the value of the royalty base), such a royalty base is likely to provide a solid foundation for a reasonable royalty damages analysis that is consistent with the incremental value of using the patented technology. Of course, to ensure such a result, this royalty base would need to be combined with an appropriate royalty rate that is consistent with all of the components that are included in the royalty base.

The expected benefits of an SSPPU-based royalty base decline as the selected SSPPU departs from the ideal conditions described above. That is, from the perspective of reflecting incremental value of using the patented technology, the usefulness of an SSPPU-based royalty base tends to decline where the SSPPU fails to include all affected components, fails to exclude components whose value receive little or no benefits from the use of the patented technology, or the value of the SSPPU is difficult to reliably quantify.¹⁰³

From the perspective of the courts, one of the most important strengths associated with adopting an SSPPU-based royalty base for use in evaluating reasonable royalty damages appears to be that the SSPPU is viewed as a safeguard against “misleading the jury by placing undue emphasis on the value of the entire product.”¹⁰⁴ In a recent article, David Kappos and The Honorable

¹⁰² *Garretson v. Clark*, 111 U.S. 120, 121 (1884) (citing *Garretson v. Clark*, 10 F. Cas. 40, 41 (N.D.N.Y. 1878)).

¹⁰³ As mentioned above, changes in the scope of the royalty base might also be able to be compensated for by appropriately adjusting the royalty rate to generate an appropriate reasonable royalty damages.

¹⁰⁴ *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014); *see also Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1320 (Fed. Cir. 2011) (“The disclosure that a company has made \$19 billion dollars in revenue from an infringing product cannot help but skew the damages horizon for the jury, regardless of the contribution of the patented component to this revenue.”) (emphasis added).

Paul R. Michel explained that this consideration was critical in the *Cornell* decision that introduced the concept of the SSPPU:

Judge Rader's opinion [in *Cornell*] made clear that the concern was with "evidence that would mislead the jury to award damages far in excess of their compensatory purpose." The focus was on the belief that juries may be unduly swayed by large revenue figures that have not first been shown to relate to the invention. That risk can be mitigated by selecting a royalty base more closely related to the invention.¹⁰⁵

In essence, the courts view the use of the SSPPU-based royalty base as a guard rail against "excessive" reasonable royalty damages awards that may arise from a combination of an over-inclusive royalty base that is not off-set by a sufficiently small royalty rate to yield an appropriate level of reasonable royalty damages.¹⁰⁶

c. Weaknesses

Although the use of the SSPPU has *the potential* to provide a sound foundation for the calculation of reasonable royalty damages that reflect the incremental value of the patented technology, a number of important issues involved in the adoption of SSPPU-based royalty bases can significantly undermine such a result.¹⁰⁷ Foremost among these issues are: (1) ambiguity in the boundaries of the SSPPU; (2) the substantial challenges involving valuation of SSPPUs; and (3) a disconnect between real-world licensing and the use of the SSPPU.

(1). Definitional Issue

The SSPPU is not always self-evident, such that selection of the SSPPU in any given case can involve substantial ambiguity and controversy.

The identification of the SSPPU in any given case can be ambiguous for, at least, two important reasons. First, the courts have yet to establish a clear standard regarding how the SSPPU should be determined. As J. Gregory Sidak explained:

[T]he Federal Circuit has not yet given a cogent limiting principle for the smallest salable patent-practicing component. It is the component within the downstream product that practices the patent in suit and is manufactured and sold separately from the downstream product. That much is not controversial The case law has identified

¹⁰⁵ Kappos & Michel, *supra* note 90, at 1439–40 (2018).

¹⁰⁶ *Id.* at 1441; *see also* *Ericsson*, 773 F.3d at 1226 ("It is not that an appropriately apportioned royalty award could never be fashioned by starting with the entire market value of a multi-component product—by, for instance, dramatically reducing the royalty rate to be applied in those cases—it is that reliance on the entire market value might mislead the jury, who may be less equipped to understand the extent to which the royalty rate would need to do the work in such instances.") (internal citations omitted); FED. TRADE COMM'N, *supra* note 23, at 209–11.

¹⁰⁷ *See* Layne-Farrar, *supra* note 1; *see also* Sidak, *supra* note 1, at 990–91.

the smallest salable patent-practicing component as a physical component on which the patent reads. However, as Judge Richard Posner has observed, “[a]lmost every product can be viewed as a package of component products.” Nearly any component will consist of smaller and even smaller components. The *reduction ad absurdum* of the Federal Circuit’s current case law is that the search for the smallest salable patent-practicing component ends with the patent itself.¹⁰⁸

Without an objective limiting principle, the adoption of an SSPPU-based royalty base retains a degree of subjectivity that can generate disputes between the parties.

Second, the SSPPU in many cases is not self-evident, in large part because specific components in a multi-component or multi-feature accuse product rarely coincide exactly with the scope of the patented technology at issue. As a result, the selection of the SSPPU can itself be a significant point of contention in the analysis of reasonable royalty damages. As explained by Edward Sherry and David Teece:

It would be one thing if the SSPPU were economically “coextensive” with the patented feature, in the sense that either (1) the SSPPU were identical to the patented feature or (2) the patented feature were “the basis” for demand for the SSPPU, but not for the device-as-sold. In such a situation, the argument would be that, even though “apportionment” was necessary or the device-as-sold, apportionment would not be necessary for the SSPPU

However, such a situation is unlikely. More commonly, the SSPPU itself is a complex multi-featured product, the patented feature is only one such feature, and the patented feature is not “the basis” for consumer demand for the entire SSPPU. For example, the SSPPU may be ABC. In such a situation, it is necessary to apportion the selling price of the SSPPU itself as between the patented feature A and other factors (B and C) that contribute to the SSPPU’s selling price.¹⁰⁹

In short, “using the SSPPU as the damages base generally does not eliminate the need to apportion, though it *may* make the apportionment task simpler.”¹¹⁰

This lack of clarity can generate a variety of practical problems in the identification of the appropriate “SSPPU-based” royalty base.

One practical problem resulting from this lack of clarity is that the “SSPPU-based” royalty base is often simply the component “where the patented technology physically resides, without serious consideration of its value footprint.”¹¹¹ For example, in *Innovatio*, the standard essential patent (“SEP”) portfolio included patents on wireless adapters that involved numerous pieces of base station equipment but the functionality of these SEPs was technically

¹⁰⁸ Sidak, *supra* note 1, at 1018–19 (citations omitted).

¹⁰⁹ Teece & Sherry, *supra* note 84, at 6.

¹¹⁰ *Id.* (emphasis added).

¹¹¹ Layne-Farrar, *supra* note 1, at 7.

implemented in Wi-Fi chips.¹¹² In that case, the expert chose Wi-Fi chips for the royalty base, even though the patented technology did not cover the entirety of the functionality of the chip.¹¹³ Similarly, in the Federal Circuit's 2018 decision *Finjan, Inc. v. Blue Coat Systems, Inc.*,¹¹⁴ the royalty base selected by the plaintiff's expert for the analysis of reasonable royalty damages was characterized as "the 'smallest, identifiable *technical* component' tied to the footprint of the invention" with no proof that this unit captured the full benefits associated with the use of the patented technology.¹¹⁵

From an economic perspective, the selection of an identifiable physical component that is not based on or coextensive with the value footprint of the patented technology may make it more difficult to ensure that reasonable royalty damages reflects the incremental value of using the patented technology—particularly in situations where the use of the patented technology results in the creation of substantial Indirect/Synergistic value creation.¹¹⁶ In such situations, some portion of the value created may involve components that have been excluded from the royalty base, making it more difficult for the damages to capture all relevant value.

Another practical issue that has arisen from the lack of clarity is that a number of patent holders have taken the SSPPU definition literally and have attempted to adopt the entire accused product as the royalty base based on the idea that the entire accused product *is* the SSPPU because no smaller component is "saleable."¹¹⁷ The Federal Circuit has rejected this argument, explaining in *VirnetX, Inc. v. Cisco Systems, Inc.*:¹¹⁸

To be sure, we have previously permitted patentees to base royalties on the "smallest salable patent-practicing unit." However, the instruction mistakenly suggests that when the smallest salable unit is used as the royalty base, there is necessarily no further constraint on the selection of the base. That is wrong . . . [T]he requirement that a patentee identify damages associated with the smallest salable patent-practicing unit is simply a step toward meeting the requirement of apportionment. Where the smallest salable unit is, in fact, a multi-component product containing several non-infringing features with no relation to the patented feature . . . , the patentee must

¹¹² See *id.*; see also *In re Innovatio IP Ventures, LLC*, No. 11 C 9308, 2013 U.S. Dist. LEXIS 144061, at *21–27 (N.D. Ill. Oct. 3, 2013).

¹¹³ See *Innovatio*, 2013 LEXIS 144061, at *21–27.

¹¹⁴ 879 F.3d 1299 (Fed. Cir. 2018).

¹¹⁵ *Id.* at 1310 (emphasis added).

¹¹⁶ See Layne-Farrar, *supra* note 1, at 7–18.

¹¹⁷ *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1327 (Fed. Cir. 2014) (citations omitted); see also *Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1311 (Fed. Cir. 2018).

¹¹⁸ 767 F.3d 1308 (Fed. Cir. 2014).

do more to estimate what portion of the value of that product is attributable to the patented technology.¹¹⁹

In other words, the court seems to be requiring the identification of an “Even Smaller Saleable Patent Practicing Unit,” without providing clear or specific guidance as to how or when “the patentee must do more to estimate what portion of the value of that product is attributable to the patented technology.”¹²⁰ The Federal Circuit has effectively imposed an obligation on parties to “apportion further” without providing any insight on how far such a process must proceed. Moreover, the court has not explained why further apportionment could not be achieved by properly adjusting the royalty rate to reflect the incremental value of the patented technology to the existing SSPPU.

(2). *Valuation Issues*

There are at least two potentially significant valuation issues associated with the use of the SSPPU as a royalty base that may impede the determination of the incremental benefits attributable to the patented technology.

First, it is often difficult to accurately or reliably determine “market” prices for the SSPPUs. In this regard, even though the SSPPU may be “salable,” there is often insufficient evidence available on the record to establish a reliable value (let alone a “market” value) of the SSPPU used as the royalty base, as Edward Sherry and David J. Teece explained:

One clear further disadvantage of the SSPPU approach is that any SSPPU analysis relies on *imputed* revenues and/or *imputed* profits (rather than the infringer’s actual revenues and/or actual profits). In some cases, we do not have actual transaction prices of the SSPPUs . . . The response that “we can estimate the SSPPU price, and assessing damages is not an exact science, so that some uncertainty in the damages base is not dispositive” is not fully responsive, since parties to a hypothetical negotiation would have to come up with some way of agreeing on the royalties due.¹²¹

Imperfect estimation of the value of the SSPPU reduces the accuracy of the estimation of the incremental value generated by the inclusion of the patented technology to the SSPPU.

Second, the cost or market price of a particular component on a stand-alone basis may not have any meaningful relationship with the value that is generated *when that component is used in combination with other components* in to a multi-component accused product. As Chief Judge Davis explained in his

¹¹⁹ *VirnetX, Inc.*, 767 F.3d at 1327 (internal citations omitted); *see also Finjan, Inc.*, 879 F.3d at 1311 (“[I]f the smallest salable unit—or smallest identifiable technical component—contains non-infringing features, additional apportionment is still required . . . Further apportionment [is] required to reflect the value of the patented technology compared to the value of the unpatented elements.”) (citations omitted).

¹²⁰ *VirnetX, Inc.*, 767 F.3d at 1327 (internal citations omitted).

¹²¹ Teece & Sherry, *supra* note 84, at 14.

2014 trial court decision in *Commonwealth Scientific & Research Organisation v. Cisco Systems, Inc.*:¹²²

[T]he primary problem with Cisco's damages model is the fact that it bases royalties on chip prices . . . [T]he benefit of the patent lies in the idea, not in the small amount of silicon that happens to be where that idea is physically implemented . . . Basing a royalty solely on chip price is like valuing a copyrighted book based only on the costs of the binding, paper and ink needed to actually produce the physical product. While such a calculation captures the cost of the physical product, it provides no indication of its actual value.¹²³

Simply put, if the full value of the infringing element *as used in the infringing product* is not reflected in the stand-alone price for the element, there is a danger that the patent damages will be understated. This valuation issue can be expected to be particularly pronounced in cases where a substantial portion of the value generated by the patent-at-issue is Indirect/Synergistic value that derives from the combination of the saleable patent-practicing component and the remaining portions of the accused product such that the Direct incremental value of the stand-alone SSPPU reflects only a small portion of the full incremental value attributable to the infringing use. Given this issue, an important consideration in selecting the reasonable royalty base for the purposes of determining reasonable royalty damages is the nature of the incremental benefit generated by the infringing use.¹²⁴

¹²² No. 6:11-cv-00343, 2014 WL 3805817 (E.D. Tex. July 23, 2014).

¹²³ *Id.* at *11; *see also* Teece & Sherry, *supra* note 84, at 15–16. The authors state:

[T]he obvious economic concern with using the prices of a component-like SSPPU, like the chipset (and especially chipset profit margins), as the baseline for assessing "reasonable royalty" damages is that, at most, one can use the chipset price (and/or chipset profits) to estimate the value to the chipset manufacturer of being able to use the patented technology, given competition in the chipset market. But there is no reason to assume (and strong reason to doubt) that chipset manufacturers capture all (or even most) of 'the value' (relative to alternative technologies that could have been used) of being able to use patented technology at other 'downstream' levels in value chain.

Id.; Kappos & Michel, *supra* note 90, at 1450–51. Kappos and Michael explain:

Frequently, a patent claims an invention operationalized in a multicomponent device—such as a computer or a smartphone—and the true value of the invention lies in the functionality it enables, not in a disembodied chip that might serve as part of the invention's implementation . . . [T]he value of a functioning device, such as a smartphone, is greater than the sum of the costs of its components. No reason exists to conclude that the value of a technology or a collection of technologies enabling a product to function must necessarily be limited to the cost of the product's constituent parts rather than the value of the whole.

Id.

¹²⁴ *See* Teece & Sherry, *supra* note 84, at 17–18.

Taken together, these valuation issues can create substantial practical challenges that decrease the potential usefulness of adopting the SSPPU as the royalty base for the purpose of accurately assessing patent damages for infringement of the patents involved.

(3). Real-World Licensing Issue

The real-world licensing issue associated with the SSPPU is simply that the SSPPU is almost never used as the basis for royalty payments in real world licenses. As explained by Edward Sherry and David J. Teece:

[T]here is an internal inconsistency between the use of the SSPPU as a damages base and the longstanding view that, in determining “reasonable royalty” patent damages, the court should try to “mimic” what would have been agreed to in a hypothetical license arising from a hypothetical negotiation between the parties, prior to the date of first infringement, on the assumption that the parties agree that one or more of the asserted claims of the asserted patent(s) will be found valid and infringed

[W]e have never seen a license that calls for the licensee to pay percentage-based running royalties based on the selling price of an SSPPU. Instead, the most common practice is for percentage-based running royalties to be calculated based on the price of the product as actually sold by the licensee.¹²⁵

In fact, courts have permitted the use of a royalty base other than the SSPPU in a number of instances because: (1) real-world licenses virtually never use an SSPPU as a royalty base; and (2) real-world licenses are a common and well-established source of royalty rates.¹²⁶

2. Entire Value of Accused Product

The main alternative to the SSPPU is the entire value of the accused product. Although courts have been reluctant to permit the use of the entire value of the accused product as the royalty base for the determination of reasonable royalty damages,¹²⁷ they have nevertheless authorized such use under a number of circumstances, including: 1) when the relevant patent is the basis for consumer demand for the infringing product; 2) when there is market evidence indicating the contribution of the patented technology to the infringing product as a whole; 3) when the scope of the relevant patent cover the entire infringing product; and 4) when use of the patent generates substantial Indirect/Synergistic value.¹²⁸ Each of these circumstances will be discussed in more detail below.

¹²⁵ *Id.* at 6.

¹²⁶ See *Commonwealth Sci. & Indus. Res. Org. v. Cisco Sys.*, 809 F.3d 1295, 1302–03 (Fed. Cir. 2015); *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1227–28 (Fed. Cir. 2014).

¹²⁷ *Sidak*, *supra* note 1, at 989.

¹²⁸ See *Intell. Prop. Owners Ass’n*, *supra* note 52, at 21.

a. Entire Market Value Rule Background

The courts have historically been reluctant to permit the use of the entire value of an accused product as the royalty base for a reasonable royalty damages determination involving multi-component accused products, setting a high standard for the use of such a royalty base. In this regard, the Federal Circuit held in 1995 in *Rite-Hite Corp. v. Kelley Co.*,¹²⁹ that “the *entire market value rule* [“EMVR”] permits recovery of damages based on the value of a patentee’s entire apparatus containing several features when the patent-related feature is the ‘basis for customer demand.’”¹³⁰

Despite this standard, the Federal Circuit has recognized the economic logic that appropriate, reasonable royalty damages can always be derived by using the full value of the accused product *as long as the royalty rate is adjusted to account for this royalty base*. For example, in *Lucent Technologies, Inc. v. Gateway, Inc.*¹³¹ in 2009, the Federal Circuit wrote:

Although our law states certain mandatory conditions for applying the entire market value rule, courts must nevertheless be cognizant of a fundamental relationship between the entire market value rule and the calculation of a running royalty damages award. *Simply put, the base used in a running royalty calculation can always be the value of the entire commercial embodiment, as long as the magnitude of the rate is within an acceptable range (as determined by the evidence).*¹³²

In other words, the court has recognized that reasonable royalty damages are typically the product of a royalty base and a royalty rate so that, in principle, a higher royalty base (*e.g.*, the entire value of the accused product) can always be matched with a lower royalty rate to yield an appropriate reasonable royalty damages number in any case.

However, two years after *Lucent*, the Federal Circuit in *Uniloc USA, Inc. v. Microsoft Corp.*¹³³ rejected the idea that litigants should be permitted to use the entire value of the accused product as the royalty base as long as the royalty rate was sufficiently low, declaring, “[t]he Supreme Court and this court’s precedents do not allow consideration of the entire market value of accused products for minor patent improvements simply by asserting a low enough royalty rate.”¹³⁴ The court’s justifications for rejecting the economic logic presented in *Uniloc* were largely non-economic, namely: (1) that *legal precedents* barred such analysis; and (2) that consideration of the full value

¹²⁹ 56 F.3d 1538 (Fed. Cir. 1995).

¹³⁰ *Id.* at 1549 (emphasis added).

¹³¹ 580 F.3d 1301 (Fed. Cir. 2009).

¹³² *Id.* at 1338–39 (emphasis added) (internal citations omitted).

¹³³ 632 F.3d 1292 (Fed. Cir. 2011).

¹³⁴ *Id.* at 1320.

of the accused product could not “help but skew the damages horizon for the jury.”¹³⁵

In 2018, the Federal Circuit articulated the current EMVR standard in *Power Integrations, Inc. v. Fairchild Semiconductor International, Inc.*:¹³⁶

[T]he entire market value rule is appropriate only when the patented feature is the sole driver of customer demand or substantially creates the value of the component parts The burden of proof in this respect is on the patent holder. . . . But when the product contains multiple valuable features, it is not enough to merely show that the patented feature is viewed as essential, that a product would not be commercially viable without the patented feature, or that consumers would not purchase the product without the patented feature. *When the product contains other valuable features, the patentee must prove that those other features did not influence purchasing decisions Without such proof, Power Integrations did not meet its burden to show that the patented feature was the sole driver of consumer demand, i.e., that it alone motivated consumers to buy the accused products.*¹³⁷

As a practical matter, the EMVR standard articulated in *Power Integrations*—*i.e.*, the patented feature is the *sole driver of consumer demand* and no other features influence purchasing decisions—is extremely high and seems unlikely to be met in many real-world circumstances.

b. Justification for Using Entire Market Value as Royalty Base

From the perspective of ensuring that reasonable royalty damages reflect the incremental value generated by the patented technology, the high bar set for using the entire value of the accused product increases the likelihood that the incremental value of the patented technology is underestimated. Such a result is likely to occur, for example, in circumstances where the patented feature is not the “sole driver of consumer demand,” but where the use of the patented technology generates substantial Indirect/Synergistic incremental value that may not be reflected in the measured or estimated value of the selected SSPPU because the full value of the benefits of using the patented

¹³⁵ See *id.*; see also Layne-Farrar, *supra* note 1, at 3. The author notes:

The Federal Circuit has explained the rationale behind its EMVR interpretation as being rooted in the potential for cognitive biases among jurors [H]aving seen a large number for total accused product revenues, a jury might ‘anchor’ on that number when assessing the damages estimates presented by the two parties, even when the case evidence clearly establishes that the patents read on only a small part of the accused product.

Id.

¹³⁶ 894 F.3d 1258 (Fed. Cir. 2018), *cert. denied*, 139 S. Ct. 1265 (2019).

¹³⁷ *Id.* at 1272. As a practical matter, it is not clear if the requirement that “the patentee must prove that those other features did not influence purchasing decisions” is an additional burden on the patentee or simply a re-phrasing of the requirement that the patentee show that the patented technology is the sole driver of demand.

technology are not confined to the stand-alone value of the specific component or components that practice the patent at issue for such products.

Perhaps aware of this issue, the Federal Circuit has recently shown some willingness to permit the use of the entire value of accused products as a royalty base in appropriate circumstances.¹³⁸ In this regard, the Federal Circuit has identified certain situations in recent years where the quality of reasonable royalty damages analyses is likely to be *improved*, rather than distorted, by the consideration of the full value of the accused product as the royalty base. These situations are described below.

(1). Basis of Demand

As discussed above, courts have justified the use of the entire value of the accused product when the patented technology drive purchasing decisions. As explained by the Federal Circuit, the EMVR “allows for the recovery of damages based on the value of an entire apparatus containing several features, when the feature patented constitutes *the basis for customer demand*.”¹³⁹ As an economic matter, the requirement that a patented feature “constitutes the basis for customer demand” is virtually impossible to meet, especially for complex, multi-component accused products.¹⁴⁰ As a result, successful

¹³⁸ See *Commonwealth Sci. & Indus. Research Org. v. Cisco Sys., Inc.*, 809 F.3d 1295, 1302–03 (Fed. Cir. 2015) (“Because the parties’ discussions centered on a license rate for the ‘069 patent, this starting point for the district court’s analysis already built in apportionment. Put differently, the parties negotiated over the value of the asserted patent, ‘and no more.’”); see also *AstraZeneca AB v. Apotex Corp.*, 782 F.3d 1324, 1338 (Fed. Cir. 2015) (“Astra’s patents cover the infringing product as a whole, not a single component of a multi-component product. There is no unpatented or non-infringing feature in the product.”).

¹³⁹ *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012) (emphasis added); see also *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1336 (Fed. Cir. 2009).

¹⁴⁰ *TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 901 (Fed. Cir. 1986). The EMVR initially evolved in the context of the assessment of lost profits damages but has been incorporated into the analysis of reasonable royalty damages in large part as a result of the Federal Circuit’s decision in *Rite-Hite Corp. v. Kelley Co.* in 1995. See 56 F.3d 1538 (Fed. Cir. 1995); see also FEDERAL TRADE COMMISSION, *supra* note 23, at 206 (identifying inconsistencies between the application of EMVR in the lost profits and reasonable royalty contexts); Alan Albright, et al., *Damages: License Comparability and the Entire Market Value Rule*, STATE BAR OF TEX. 9th ANN. ADVANCED PAT. LITIG. COURSE, July 2013, at 9 <http://stoneturn.com/wp-content/uploads/2016/08/Advanced-Patent-Litigation-Presentation.pdf> [<https://perma.cc/N4G7-BEPD>] (“[P]atentees seeking to rely on the entire market value of a multicomponent product face an incredibly high evidentiary hurdle. Indeed, given the increasing complexity of modern-day products, particularly in the electrical and mechanical spaces, it seems unlikely that any one component could ever be shown to be the basis for consumer demand.”).

invocation of the EMVR is relatively rare compared to the frequency of use of the SSPPU.

(2). Licensing Evidence

In addition to situations where the EMVR is satisfied, courts have also permitted the use of the entire value of the accused product as the royalty base for the purpose of assessing the reasonable royalty base when there was market-based evidence (*i.e.*, arm's-length negotiations or a completed license) that established *the incremental value of the patented technology relative to the value of the entire product*. For example, the Federal Circuit permitted the use of the entire value of the accused product in *Commonwealth Science & Industry Research Organisation v. Cisco Systems, Inc.*,¹⁴¹ where the royalty rate relied upon was derived from negotiations between the parties for licensing the patented technology and used the value of the accused product as the base.¹⁴² The court explained:

Fundamentally, the smallest salable patent-practicing unit principle states that a damages model cannot reliably apportion from a royalty base without that base being the smallest salable patent-practicing unit. That principle is inapplicable here, however, as the district court did not apportion from a royalty base at all. Instead, the district court began with the parties' negotiations Because the parties' discussions centered on a license rate for the '069 patent, this starting point for the district court's analysis already built in apportionment. Put differently, the parties negotiated over the value of the asserted patent, "and no more."¹⁴³

In short, the court concluded that the parties themselves determined the value of the patented technology relative to the full product, so no further adjustment was appropriate. In *Sprint Communications Co., L.P. v. Time Warner Cable, Inc.*,¹⁴⁴ the Federal Circuit again permitted the use of the unapportioned value of the accused product as the royalty base in conjunction with the use of comparable licenses that adopted such a base, explaining:

The fact that two other licenses were granted for the same technology, together with the Vonage verdict—all of which were for the same royalty rate as the rate utilized in the Vonage case to yield the \$1.37 per VoIP subscriber per month damages assessment—provides strong support for Sprint's argument that *the damages award in this case reflected the incremental value of the inventions* and thus satisfied the requirement of apportionment.¹⁴⁵

¹⁴¹ F.3d 1295 (Fed. Cir. 2015).

¹⁴² *Id.* at 1302–03.

¹⁴³ *Id.*; see also *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1227–28 (Fed. Cir. 2014).

¹⁴⁴ 760 F. App'x 977 (Fed. Cir. 2019).

¹⁴⁵ *Id.* at 983 (emphasis added).

Once again, because the parties themselves determined the value of the patented technology relative to the full value of the infringing product, no further adjustment was needed.

(3). Scope of Patent Claims

Courts have also permitted the use of the entire value of the accused product as the royalty base for the purpose of assessing a reasonable royalty when the scope of the patent claims effectively precluded segregation of the multi-component product into an SSPPU smaller than the entire accused product. For example, in *Exmark Manufacturing Co. v. Briggs & Stratton Power Products Group, LLC*,¹⁴⁶ the accused product was a “multi-blade lawn mower” and the patented improvement involved a modification of the mower blade deck (a portion of the lawn mower).¹⁴⁷ There was no claim that the patented mower blade deck configuration satisfied the EMVR, but the court found that “the asserted claim [of the patent was] . . . in fact, directed to the lawn mower as a whole.”¹⁴⁸ Under those circumstances, the court permitted the entire value of the mower to be used as the royalty base, explaining:

Using the accused lawn mower sales as the royalty base is particularly appropriate in this case because the asserted claim is, in fact, directed to the lawn mower as a whole There is no unpatented or non-infringing feature of the product.¹⁴⁹

In accepting the full-value royalty base, the court noted that “[t]he parties do not dispute that apportionment is required in this case” and held “that such apportionment can be done in this case through a thorough and reliable analysis to apportion the royalty rate.”¹⁵⁰ The court reached a similar conclusion in *AstraZenica AB v. Apotex Corp.*¹⁵¹

(4). Indirect/Synergistic Value

Fourth, courts have permitted the use of the entire value of the accused product for the purpose of determining reasonable royalty damages when the patented technology generated substantial Indirect/Synergistic value. In

¹⁴⁶ 879 F.3d 1332 (Fed. Cir. 2018).

¹⁴⁷ *Id.* at 1348.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* It should be noted that the use of the full value of the mower as the royalty base was also supported by the fact that this royalty base was used in one of the settlement licenses relied upon by the plaintiffs’ damages expert. *See id.*

¹⁵⁰ *Id.*

¹⁵¹ 782 F.3d 1324, 1338 (Fed. Cir. 2015) (“Astra’s patents cover the infringing product as a whole, not a single component of a multi-component product. There is no unpatented or non-infringing feature in the product [T]he standard *Georgia-Pacific* reasonable royalty analysis takes account of the importance of the inventive contribution in determining the royalty rate”).

this regard, the Federal Circuit issued a nonprecedential decision in April 2014 in *University of Pittsburgh of the Commonwealth System of Higher Education v. Varian Medical Systems*,¹⁵² a case that involved a Real-Time Position Management Respiratory Gating System (“RPM System”) (a “video-based system that monitors and tracks patient respiratory movement during treatment”).¹⁵³ The RPM System was designed for use with radiotherapy treatment machines.¹⁵⁴ RPM sold infringing systems both on a stand-alone basis and in conjunction with the sale of radiotherapy treatment machines.¹⁵⁵ At the end of trial, the jury awarded two types of damages: (1) 10.5% of stand-alone RPM System sales; and (2) 1.5% of sales of radiotherapy treatment machines that were sold with an RPM System.¹⁵⁶

On appeal, the Federal Circuit upheld the award that used sales of radiotherapy treatment machines as a royalty base, noting that “the evidence at trial shows that [the infringer] itself has acknowledged the value added by the function of the combined apparatus.”¹⁵⁷ In its decision, the court emphasized “the fact- and record-specific nature of [its] holding,” which was influenced by the infringer’s failure to effectively respond to the patent holder’s arguments on these issues.¹⁵⁸ Nevertheless, it was notable that the Federal Circuit in this case “found that evidence of complementarity effects between the patented and non-patented features sufficed to justify the patent holder’s use of the EMVR.”¹⁵⁹

(5). *Need for Royalty Rate Apportionment*

From the perspective of apportionment, the Federal Circuit has recognized that the use of the full value of the accused product as the royalty base does not eliminate the *Garretson* requirement “to separate or apportion the defendant’s profits and the patentee’s damages between the patented feature and the unpatented features.”¹⁶⁰ Rather, in situations where the royalty base is not apportioned, the responsibility to apportion of value between the

¹⁵² 561 Fed. App’x 934 (Fed. Cir. 2014).

¹⁵³ *Id.* at 936.

¹⁵⁴ *See id.* at 937.

¹⁵⁵ *See id.*

¹⁵⁶ *See id.* at 945.

¹⁵⁷ *Id.* at 947 (“[I]f the claimed invention only adds an incremental value to the conventional element(s), the damages awarded must also be . . . limited [to the patented component]. But, if the claimed invention adds significant value to the [non-patented] conventional element(s), the damages award may reflect that value.”).

¹⁵⁸ *Id.* at 950.

¹⁵⁹ Sidak, *supra* note 1, at 1012.

¹⁶⁰ *Garretson v. Clark*, 111 U.S. 120, 121 (1884) (citing *Garretson v. Clark*, 10 F. Cas. 40, 41 (N.D.N.Y. 1878)).

patented and non-patented contributors of value shifts primarily to the *royalty rate*—which must be adjusted to ensure the reasonable royalty damages are consistent with the incremental value associated with the use of the patented technology. In this regard, the court noted in *Exmark* that, even though the royalty base was the full value of the infringing product, “[t]he parties do not dispute that apportionment is required in this case” and held “that such apportionment can be done in this case through a thorough and reliable analysis to apportion the royalty rate.”¹⁶¹ Royalty rate apportionment is discussed in Part III.C below.

c. Strengths

The use of a royalty base that reflects the entire market value of the accused product that incorporates the infringed patent provides, at least, three strengths with regard to the accurate assessment of the incremental value of the patent.

The first strength is that the value of this royalty base is typically reliable and readily available. In this regard, the value of this royalty base typically does not require estimation and can be calculated directly from the evidence produced by the infringer (*e.g.*, sales records). These data provide a more solid foundation for further analysis compared to a circumstance where the underlying value of the royalty base is subject to some uncertainty and, therefore, dispute.

The second strength is that this royalty base will include not only the Direct incremental value attributable to the patented technology, but also all of the Indirect/Synergistic incremental value generated by using the patented technology in conjunction with all the other components of the accused product.¹⁶² In cases where a substantial portion of the incremental value generated by the patented technology derives from the combination of the patented technology with other aspects of the accused products, accurate evaluation of the incremental benefits of using the patented technology is more likely if all elements of the infringing products are included in the royalty base, rather than just the specific element in which the patented technology is used.¹⁶³

The third strength is that this royalty base is the one that is typically used in real-world patent licenses.¹⁶⁴ Accordingly, if a sufficiently comparable license

¹⁶¹ *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1348 (Fed. Cir. 2018).

¹⁶² See *Intell. Prop. Owners Ass’n*, *supra* note 52, at 26–28.

¹⁶³ See *Sidak*, *supra* note 1, at 995–96 (“On economic grounds, the use of the value of the downstream product as a royalty base is generally warranted when strong complementarity effects exist between the component featuring the patented technology and the downstream product’s other components.”); see also *Bailey et al.*, *supra* note 1, at 262.

¹⁶⁴ See *Sidak*, *supra* note 1, at 996.

is produced in a given proceeding that reflects an arm's-length valuation of the patented technology, it is likely that the royalty base that is used in such a license will be a percentage of the value of the accused product and not some artificial SSPPU.¹⁶⁵ Under these circumstances, the royalty base used in the calculation of reasonable royalty damages should be consistent with the terms of the royalty rate that is relied upon for the calculation—which is likely to be the entire market value of the accused product.

d. Weaknesses

Notwithstanding these strengths, there are notable weaknesses with using the entire value of the accused product as the royalty base from the perspective of ensuring reasonable royalty damages are consistent with the incremental value associated with the use of the patented technology.

One key weakness is that the entire value of the accused may depend on a large number of non-patented contributors of value whose contributions must be excluded from the estimation of the incremental value of the patented technology, and the relative value of the incremental contribution of the patented technology may be exceedingly small compared to all other contributors. The combination of many contributors and a small relative contribution of the patented technology can make the identification, isolation, and quantification of the incremental contribution of the patented technology more difficult and subject to greater uncertainty. Moreover, with a relatively large royalty base, small errors in the estimation of the incremental contribution of the patented technology could have a substantial impact on the determination of reasonable royalty damages.¹⁶⁶

Another potential weakness associated with using the full value of the accused product as the royalty is that some courts have expressed significant concern that discussion of the entire value of the accused product can mislead

¹⁶⁵ See Teece & Sherry, *supra* note 84, at 6. The authors state:

[W]e have never seen a license that calls for the licensee to pay percentage-based running royalties based on the selling price of an SSPPU. Instead, the most common practice is for percentage-based running royalties to be calculated based on the price of the product as actually sold by the licensee.

Id.

¹⁶⁶ See Cotter et al. (2019), *supra* note 68, at 45.

the jury and “skew the damages horizon,”¹⁶⁷ raising concerns of artificially inflated damages awards.¹⁶⁸

Three points should be made about this concern. First, commentators have noted that courts have cited no evidence *to prove* that use of the entire value of the accused product systematically distorts actual juror decision-making in a manner that inflates reasonable royalty damages awards,¹⁶⁹ suggesting that courts may be pre-empting a problem that may not exist or, more likely, may only arise in some cases.¹⁷⁰ As Gregory Sidak noted:

¹⁶⁷ *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1320 (Fed. Cir. 2011) (“The disclosure that a company has made \$19 billion dollars in revenue from an infringing product *cannot help but skew the damages horizon* for the jury, regardless of the contribution of the patented component to this revenue.”) (emphasis added). *But cf.* *Fractus, S.A. v. Samsung Elecs. Co.*, 876 F. Supp. 2d 802, 833–34 (E.D. Tex. 2012) (the expert’s “references to the average price of Samsung’s cell phones was supported by the record evidence, not merely speculative, and was not intended to, and did not, ‘skew the damages horizon for the jury’”) (citing *Uniloc USA, Inc.*, 632 F.3d at 1319).

¹⁶⁸ See Teece & Sherry, *supra* note 84, at 9. The authors state:

[S]ome courts seem to have been persuaded that, psychologically, juries are more likely to award higher total damages when the issue is framed as a “reasonable royalty” rate applied to a larger base—such as the entire complex product as sold—than when a “reasonable royalty” rate is applied to a smaller base—such as the imputed revenues associated with the SSPPU. Similarly, some courts appear to have concluded that allowing juries to calculate “reasonable royalty” damages using a starting point of a larger damages base—a higher “anchor” point—will yield higher damages than allowing them to calculate damages using a starting point of a smaller (narrower) damages base—a lower “anchor” point.

Id.; see also Kappos & Michel, *supra* note 90, at 1444. Kappos and Michel state:

[Avoidance of the entire market value of accused products] is an evidentiary tool designed primarily for jury cases . . . and aimed at apportioning the value of a patented invention before the damages question is put to a jury, to prevent jurors from being misled by large revenue or profit numbers, thereby addressing a perceived risk of runaway jury verdicts.

Id.; see also Sidak, *supra* note 1, at 1021–23 (commentators have noted that courts have cited no evidence to prove that use of the entire value of the accused product tends to distort juror decision-making in a manner that inflates reasonable royalty damages awards).

¹⁶⁹ See Teece & Sherry, *supra* note 84, at 12; see also Sidak, *supra* note 1, at 1021–23 (discussing ambiguity of findings of behavioral economics concerning potential jury bias created by exposure to large numbers); Cotter, *supra* note 73, at 203 (“[A]lthough the cognitive biases that advocates of the SSPPU invoke may be well-documented in many settings, whether they are likely to affect the calculation of damages within the formal setting of a trial remains a hypothesis, not a proven fact.”).

¹⁷⁰ See Kappos & Michel, *supra* note 90, at 1440–44 (noting that the SSPPU has been used only in jury trials). It should be noted that “there is experimental evidence that jury awards increase with higher dollar requests made by plaintiff attorneys, and that this effect

The Federal Circuit has not clearly articulated its theory of cognitive bias among jurors in cases concerning reasonable-royalty damages for the infringement of patented technologies implemented in multi-component products. The court has not expressed the process by which cognitive bias manifests itself, nor has it rigorously questioned the likelihood of the bias occurring in the award of reasonable-royalty damages. In fact, the theories in behavioral economics do not necessarily support the Federal Circuit's concern. Rather, research in behavioral economics finds that individuals are typically averse to extreme results, which would include awarding extreme damages. It is therefore equally plausible that juries would adopt a cautious approach when awarding damages for patent infringement and thus undercompensate the patent holder. In the absence of further evidence, there is no intellectually rigorous justification for the Federal Circuit's concern that using the entire market value of the downstream product as the royalty base would cause the patent holder to receive excessive compensation.¹⁷¹

In short, the widely-shared concern expressed by courts that consideration of the full value of the accused product is likely to skew damages is, in fact, merely an assumption whose relevance and applicability should be determined in each relevant case.

Second, even if consideration of a "full value"-based royalty base poses a danger to "skew the damages horizon" in *some* cases, it is not clear that imposing categorical or near-categorical rules preventing consideration of "full value"-based in all cases is the appropriate response. A more tailored response to this issue would involve measures to directly address issues of potentially prejudicial damages and information directly. For example, a court could provide jury instructions designed to minimize any prejudicial impact of a large revenue or product price number or limit the information made available to juries. Third, categorically excluding consideration of the full value generated by the accused product in the analysis of reasonable royalty damages appears to be inconsistent with the teachings of *Georgia-Pacific*. In this regard, *Georgia-Pacific* Factor 8 suggests that "*the established profitability of the product made under the patent; its commercial success; and its current popularity*" *should be considered* in the process of assessing reasonable royalty damages.¹⁷² Assuming that the "product made under the patent" refers to the accused product and not an artificially identified SSPPU (which appears to be the case), it is difficult to reconcile this factor with a near-categorical exclusion of this information from discussions concerning the royalty base.

A third weakness associated with the use of the entire market value of the accused product as the royalty base for the determination of reasonable royalty damages from a litigation perspective is that courts have shown resistance to

cannot be overcome by contrary evidence presented by defendants." *Intell. Prop. Owners Ass'n*, *supra* note 52, at 32.

¹⁷¹ *Sidak*, *supra* note 1, at 1022–23 (internal citations omitted).

¹⁷² *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (emphasis added).

such use and will exclude analyses based on such a royalty base if it is found to be inappropriate.¹⁷³ To date, the use of the entire value of the accused product is still regarded as an exception to the general rule and preference for an apportioned royalty base that is based on the SSPPU.¹⁷⁴ As a result, adoption of such a royalty base by an expert can be very risky due to the possibility that such an analysis has a relatively high chance of being excluded.¹⁷⁵

3. Choosing the Most Appropriate Royalty Base

Although the Federal Circuit has established a clear preference for using an SSPPU-based royalty base and substantially limited the use of the entire value of the accused product as a royalty base, the differing strengths and weaknesses associated with each of these options suggests that it would be better to base the selection of a royalty base for the determination of reasonable royalty damages in any given case on which royalty base is most likely to generate a damages award that reflects the incremental value of using the patented technology in each specific case.¹⁷⁶ In this regard, one of the key drivers of the royalty base selection in a given case is the availability of accurate information concerning a conforming royalty rate that will allow the combination of the selected royalty base and royalty rate to reflect the incremental value of using the patented technology.

As a practical matter, the adoption of an SSPPU-based royalty base will be most appropriate in many cases. In other cases, the adoption of a royalty base that includes the full value of the accused product will be most appropriate. In still other cases, consideration and comparison of both royalty bases (and appropriate conforming royalty rates) may be the most appropriate way to evaluate reasonable royalty damages. The most appropriate royalty base for any given case should be determined based on the available evidence in the case.

a. Choosing an SSPPU-Based Royalty Base

Reliance on an SSPPU-based royalty base is likely to be most useful in circumstances where an SSPPU can be selected that is consistent with the economic footprint of the patented technology and where it is possible to determine the value of the SSPPU with a sufficient degree of accuracy to enable a reasonable assessment of the incremental value of using the patented technology. As discussed above, identifying an SSPPU that approximates the economic footprint of the patent requires not only the identification

¹⁷³ See Sidak, *supra* note 1, at 989

¹⁷⁴ See *id.*

¹⁷⁵ See *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 894 F.3d 1258, 1272 (Fed. Cir. 2018).

¹⁷⁶ Some commentators have observed that additional royalty base alternatives should be available. See Layne-Farrar, *supra* note 1, at 1.

of those components of the accused product whose value is affected by the use of the patented technology (which should be included in the SSPPU), but also the identification of those portions of the accused product whose value is not affected by the use of the patented technology (which should be excluded from the SSPPU).¹⁷⁷ To the extent that either of these components cannot be identified within a reasonable degree of confidence, the adoption of any particular SSPPU is more likely to be arbitrary and be of limited value in determining the incremental value of using the patented technology.¹⁷⁸

In the event that an SSPPU-based royalty base is deemed to be appropriate, the main challenge for the determination of reasonable royalty damages is likely to be identifying a royalty rate that reasonably reflects the incremental value that using the patented technology confers to the *specific SSPPU* that is selected. In this regard, real-world licenses seldom adopt royalty rates that rely upon SSPPU-based royalty bases,¹⁷⁹ so some degree of estimation and approximation is likely to be needed to obtain a royalty rate that is consistent with the SSPPU-based royalty rate selected for the calculation of reasonable royalty damages.

b. Choosing a Full Value-Based Royalty Base

Reliance on a full accused product value-based royalty base is likely to be most useful in circumstances where the incremental value of using the patented technology tends to affect a substantial portion of the overall accused product (*i.e.*, where it is difficult to isolate the portions of the accused product whose value does and does not change as a result of using the patented technology), where the valuation of any potential SSPPU is likely to be difficult or unreliable, and where there is reliable evidence of an appropriate royalty rate that is tied to the full value of the accused product.¹⁸⁰ In each of these circumstances, reliance on a full value royalty base is likely to facilitate estimation of reasonable royalty damages that are consistent with the incremental value of using the patented technology, in part due to relative ease in estimating a royalty rate that can be combined with such a royalty base to yield an accurate damages calculation.

A key concern when adopting a royalty base based on the full value of the accused product is whether the use of the larger royalty base may distort the damages calculation. The relevance of this concern should be evaluated based on the facts of each case and should not simply be assumed to be a problem in all cases. In circumstances where the use of the patented technology

¹⁷⁷ See *supra* Part III.B.2.

¹⁷⁸ See *supra* Part III.B.2.

¹⁷⁹ See Teece & Sherry, *supra* note 84, at 6 (“[W]e have never seen a license that calls for the licensee to pay percentage-based running royalties based on the selling price of an SSPPU.”).

¹⁸⁰ See *supra* Part III.B.3.

accounts for a tiny fraction of the overall value of the accused product, such a concern may be warranted not only because consideration of the full value of the accused product may skew jurors' perception of potential damages, but also because the larger royalty base increases the potential magnitude of damages errors in the event that the royalty rate is too high. Conversely, in circumstances where the portion of value attributable to the patented technology is relatively large compared the overall accused product, this concern may not be warranted, even if the patented technology cannot be construed as being the main driver of demand for the accused product, because there is less of a chance for skewing of jurors' perceptions and the magnitude of damages errors due to inaccurate royalty rates is lower. In cases where the distortion of damages analyses is likely with a larger royalty base, it may be necessary for a court to manage the way in which the information is presented to the jury to minimize such potential harm and/or provide clear instructions to the jury that guard against distorted damages determinations.¹⁸¹

Interestingly, none of the analyses or considerations that make it possible to choose which version of the royalty base is more effective is directly related to the main consideration that courts have historically used to determine whether a "full-value"-based royalty base is appropriate—namely, whether the patented technology is the sole basis for consumer demand.

C. Royalty Rate

The second key component of the apportionment process used to ensure that reasonable royalty damages are consistent with the incremental value of the contribution of patented technology is the royalty rate. In *Exmark Manufacturing Co. Inc. v. Briggs & Stratton Power Products Group, LLC*,¹⁸² where the royalty base was found to include *the full value of the accused product*, the Federal Circuit wrote:

We hold that such *apportionment can be done in this case through a thorough and reliable analysis to apportion the royalty rate*. We have recognized that one possible way to do this is through a proper analysis of the *Georgia-Pacific* factors. As we have explained, "the standard *Georgia-Pacific* reasonable royalty analysis takes account of the importance of the inventive contribution in determining the royalty rate that would have emerged from the hypothetical negotiation."¹⁸³

¹⁸¹ See, e.g., Risch, *supra* note 3, at 241 ("To the extent there is concern that large revenues lead to prejudice with the jury, experts could be required to report per-unit royalties rather than percentage royalties if the evidence allows.").

¹⁸² 879 F.3d 1332 (Fed. Cir. 2018).

¹⁸³ *Id.* at 1348–49 (internal citations omitted); see also *Sprint Comm'ns Co., L.P. v. Time Warner Cable, Inc.*, 760 F. App'x 977, 983 (Fed. Cir. 2019) ("[T]he objective of apportionment can be achieved in different ways, one of which is through the jury's determination of an appropriate royalty by [application of] the so-called *Georgia-Pacific* factors.").

In this decision, the court acknowledged that the: (1) apportionment analysis can and should be an element of reasonable royalty rate determinations in appropriate cases; and (2) *Georgia-Pacific* analysis represents a form of apportionment analysis in that it seeks to isolate the contribution of the infringed patent in setting the reasonable royalty rate.

After all the necessary adjustments and apportionments have been made to the baseline royalty rates obtained from comparable licenses and/or incremental benefits analyses, these rates should provide a well-grounded, market-based evaluation of the value of using the patented technology. When combined with conforming royalty base, the resulting reasonable royalty damages are likely to be consistent with the incremental value generated by the technology.

1. Overview of Royalty Rate Analysis

As a conceptual matter, the analysis and apportionment of royalty rates can be divided into two steps. In the first step, a *baseline* royalty rate is identified based on available evidence that reflects (or, more specifically, includes) the incremental value generated by using the patented technology.¹⁸⁴ In recent years, the courts have placed increasing emphasis on ensuring that the baseline royalty rates used in reasonable royalty damages determination are reliable and supported by case-specific evidence.¹⁸⁵ Those courts have specifically scrutinized the evidence and analyses used to derive these rates, including not only closer consideration of the comparability of licenses that are often used as the basis for baseline royalty rates, but also more careful evaluation of any incremental benefits analyses that might be used as the foundation for baseline rates.¹⁸⁶

In the second step of the royalty rate analysis, the baseline rate is adjusted and/or apportioned to isolate the portion of the baseline rate that is attributable to the patented technology from the portions that are attributable to other contributors of value whose value of is reflected in the baseline

¹⁸⁴ This baseline rate can be derived from a variety of analyses, including: 1) the Incremental Benefit (or Income) Approach, which seeks to identify the gains generated by the use of the patent; 2) the Licensing Comparables (or Market) Approach, in which an appropriate price (*i.e.*, royalty rate) for the use of the patents-at-issue is derived from the examination of the terms of actual transfers of rights (*e.g.*, licenses) involving comparable technology; and 3) the Design-Around (or Cost/Cost Savings) Approach, in which royalty rates are derived from the costs that the infringer would have incurred to generate the benefits of the patent without practicing the patent. *See* Jarosz and Chapman, *supra* note 28, at 813–28.

¹⁸⁵ *See, e.g.*, *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 77–78 (Fed. Cir. 2012); *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011).

¹⁸⁶ *See* *Ericsson Inc. v. TCL Commc'n Tech. Holdings, Ltd.*, No. 2:15-cv-00011-RSP, 2018 WL 3089701, at *3–5, (E.D. Tex. Mar. 7, 2018).

rate. In this context, “adjustment” refers to modifications of the baseline royalty rate to reflect relevant differences between the circumstances that gave rise to the “comparable” license and the assumed circumstances of the hypothetical negotiation, such as differences in the relationship between the negotiating parties or timing of the respective agreements. In this context, “apportionment” of the royalty rate refers to separating the portion of the (adjusted) royalty rate that is attributable to (or consistent with) the use of the patented technology from the portion of the royalty rate that is attributable to other factors, such as other patents, other intellectual property rights (*e.g.*, know-how), or other benefits provided in exchange for the royalty payment (*e.g.*, avoided litigation costs).¹⁸⁷

2. *Baseline Royalty Rate*

Royalty rates used in assessing reasonable royalty damages are generally obtained either from patent licenses (including settlement agreements) that compensate the license holder for the use of similar or identical technology or from some form of incremental benefits analysis that estimates the value generated by using the patented technology.¹⁸⁸ As discussed below, courts have required increasingly careful consideration of the source of the proposed baseline royalty rate to ensure it is appropriate to serve as a basis for evaluating the incremental value contributed by using the patented technology.

a. *“Comparable” License Rates*

When reliable comparable licenses are available in a given case, they can be extremely valuable in assessing the royalty rate that should be paid for use of a patented technology.¹⁸⁹ After all, comparable licenses provide an objective, arm’s-length, market-based reference for the amount and form of compensation

¹⁸⁷ *Exmark Mfg. Co.*, 879 F.3d at 1348–49 (“[T]he standard Georgia-Pacific reasonable royalty analysis takes account of the importance of the inventive contribution in determining the royalty rate that would have emerged from the hypothetical negotiation.”) (quoting *AstraZeneca B v. Apotex Corp.*, 782 F.3d 1324, 1338 (Fed. Cir. 2015)); *see also* *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1228 (Fed. Cir. 2014) (noting that the *Georgia-Pacific* factors “do take the concepts of apportionment into account to some extent”).

¹⁸⁸ *See* Jarosz & Chapman, *supra* note 28, at 813–23.

¹⁸⁹ *See* GREGORY K. LEONARD & LAUREN J. STIROH, *A Practical Guide to Damages, in* ECONOMIC APPROACHES TO INTELL. PROPERTY POL’Y, LITIG., & MGMT. 27, 49–50 (2005); *see also* GORDON V. SMITH & RUSSELL L. PARR, *INTELLECTUAL PROPERTY: VALUATION, EXPLOITATION AND INFRINGEMENT DAMAGES* 169–84 (Lauren Stiroh et al. eds. 2005). Consideration of comparable licenses is typically considered pursuant to the first two of the *Georgia-Pacific* factors. *See Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (“1. The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty. 2. The rates paid by the licensee for the use of other patents comparable to the patent in suit.”).

that is reasonable to pay for access to the technology in question that derives from a process that is roughly similar to hypothetical negotiation used to assess reasonable royalty damages.¹⁹⁰ As explained by the Federal Circuit, “Actual licenses to the patented technology are highly probative as to what constitutes a reasonable royalty for those patent rights because such actual licenses most clearly reflect the economic value of the patented technology in the marketplace.”¹⁹¹

Of course, the more comparable the transactions are to the transaction under consideration, the more helpful the information is for assessing a reasonable royalty.¹⁹²

In discussing “comparability,” it is important to note that the assessment of whether particular licenses are “comparable” or “not comparable” should not be approached as a binary choice. Available licenses rarely break down cleanly into “comparable” and “not comparable” categories.¹⁹³ Rather, license “comparability” tends to fall on a spectrum, with different licenses exhibiting differing degrees of comparability with one another.¹⁹⁴ The assessment of whether any given license will be considered “comparable” in a case depends on the specific circumstances of case, including the nature and quality of other licenses that are available in that case.¹⁹⁵

¹⁹⁰ J. Gregory Sidak, *Bargaining Power and Patent Damages*, 19 STAN. TECH. L. REV. 1, 10 (2015) (“[C]omparable licenses . . . provide evidence of a market-disciplined price for the patented technology. The most reliable way to establish the bounds of the bargaining range is therefore to use observations of prices stated in comparable licenses or market-disciplined prices observed elsewhere in the factual record.”); see also LEONARD & STIROH, *supra* note 189176, at 49–50.

¹⁹¹ *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 79 (Fed. Cir. 2012).

¹⁹² Potential comparable licenses or transactions can differ from the hypothetical license in many ways, including: the parties to the transaction, the time of the transaction, the existing and projected market conditions, the nature of the IP or asset transferred, the scope of the license, the strength of the IP or asset transferred, the costs of design-around and the relative bargaining strength of the parties. See LEONARD & STIROH, *supra* note 189176, at 52–64. Given the number of different variables for any given pair of transactions, it is virtually impossible to find two identical transactions.

¹⁹³ Chien & Schulman, *supra* note 46, at 222–25.

¹⁹⁴ See Jarosz & Chapman, *supra* note 28, at 819.

¹⁹⁵ For example, a settlement license was determined to be “the most reliable license in this record” in *ResQNet.com* and the “least reliable license by a wide margin” in *LaserDynamics*. *LaserDynamics*, 694 F.3d at 77–78; see *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 872 (Fed. Cir. 2010); see also *Intell. Prop. Owners Ass’n*, *supra* note 52, at 11 (“Comparability is generally analyzed by considering whether the prior agreement and the hypothetical negotiation involve comparable technology, comparable economic circumstances, similar structure (*i.e.*, lump sum *v.* running royalty as a percentage of sales, running royalty as an amount per unit) and arise under comparable circumstances.”).

Potential comparable licenses or transactions can differ from the hypothetical license in many ways.¹⁹⁶ In evaluating license for potential use in establishing a baseline rate, the fundamental question to be addressed is, “Do the observed terms of the proposed ‘comparable’ license provide useful and probative information concerning the value of the use of the patented technology-at-issue?”

Under some circumstances, the differences between licenses may be considered too great to make reliance on a proposed “comparable license” inappropriate for use in the determination of the reasonable royalty rate.

One important difference that can preclude reliance on a potential “comparable” license for the purpose of assessing a reasonable royalty rate is a fundamental difference in the technology covered by the “comparable” and hypothetical licenses.¹⁹⁷ For example, in *ResQNet.com*, the Federal Circuit found that the “majority of the licenses on which ResQNet relied” were insufficiently related to the hypothetical negotiation because the technology of

¹⁹⁶ Relevant dimensions of license comparability between the hypothetical license and actually licenses include (but are not limited to): (1) the technology covered by each license; (2) the extent of additional rights covered by each license (including rights to unrelated technologies); (3) the purpose for which the technology is licensed; (4) the amount of relevant valuation information that is available to the negotiating parties; (5) legal circumstances; (6) the terms of the each license (e.g., fee structure and extent of exclusivity); (7) the nature of the relationship between the licensee and licensor; and (8) the timing of each license. See generally Brian M. Fogarty et al., *Is This License Comparable? Issues Facing Damages Experts When Determining Reasonable Royalties*, UT LAW CLE (Jan. 2013), https://bannerwitcoff.com/_docs/library/articles/ARTICLE%20—%20APLI.Is%20this%20License%20Comparable.January%202013.pdf [<https://perma.cc/YF82-X6TJ>].

¹⁹⁷ For example, in *ResQNet.com*, the Federal Circuit found that the “majority of the licenses on which ResQNet relied” were insufficiently related to the hypothetical negotiation because the technology of many of the licenses had “no relationship to the claimed invention.” 594 F.3d at 869–70, 877; see also *Wordtech Sys. v. Integrated Networks Sols., Inc.*, 609 F.3d 1308, 1319–20 (Fed. Cir. 2010); *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1327–28 (Fed. Cir. 2009). In *IP Innovation LLC v. Red Hat, Inc.*, the Eastern District of Texas, with Federal Circuit Judge Rader sitting by designation, noted that IPI’s expert relied upon royalties from a variety of broad “software industry” and “computer and electronic products manufacturing industry” licenses. 705 F. Supp. 2d 687, 691 (E.D. Tex. 2011). The court found that the expert, however, offered “no evidence that the alleged industry agreements are in any way comparable to the patents-in-suit.” *Id.* And in *Lucent*, the Federal Circuit found that the jury’s award could not be supported by license agreements where the patentee’s expert “supplied no explanation . . . about the subject matter or patents covered by those agreements.” 580 F.3d at 1329. In all of these cases, reliance on licenses that were not shown to cover sufficiently comparable technology for the purpose of assessing reasonable royalty damages was not permitted.

many of the licenses had “no relationship to the claimed invention.”¹⁹⁸ And in *Lucent*, the Federal Circuit found that the jury’s award could not be supported by license agreements where the patentee’s expert “supplied no explanation . . . about the subject matter or patents covered by those agreements.”¹⁹⁹ In all of these cases, reliance on licenses that were not shown to cover sufficiently comparable technology for the purpose of assessing reasonable royalty damages was not permitted.

Another circumstance that often results in the exclusion of a potential comparable license from consideration in a reasonable royalty rate analysis is the substantial difference in the types of consideration for which the agreed-upon royalty rate is paid.²⁰⁰ For example, in many patent licenses negotiated in settlement of litigation, the most valuable consideration provided by the patent holder is *not* the license to the use the patented technology—it is the commitment to terminate the litigation.²⁰¹ Depending on the circumstances of the case, such consideration has been found to render the royalty terms in such agreements unreliable for the purpose of assessing reasonable royalty damages because the royalty in the settlement license may be inflated by the licensees’ desire to avoid litigation expenses.²⁰²

A third common reason licenses are found to be non-comparable is a substantial difference in licensing terms.²⁰³ The hypothetical license used to evaluate reasonable royalty damages is typically assumed to be a non-exclusive, naked license to practice a valid, enforceable, and infringed patent in the United States.²⁰⁴ In many cases, there are no actual licenses that have or even approximate these characteristics.

¹⁹⁸ *ResQNet.com*, 594 F.3d at 869–70; *see also Wordtech Sys.*, 609 F.3d at 1320; *Lucent Techs.*, 580 F.3d at 1327–28; *IP Innovation*, 705 F. Supp. 2d at 691.

¹⁹⁹ *Lucent Techs.*, 580 F.3d at 1328.

²⁰⁰ *See* Michael J. Chapman, *Using Settlement Licenses in Reasonable Royalty Determinations*, 49 INTELL. PROP. L.R. 313, 332–33 (2009); *see also* Fogarty et al., *supra* note 196, at 2–14.

²⁰¹ *See* Chapman, *supra* note 200, at 332–33; *see also* *Rude v. Westcott*, 130 U.S. 152, 167 (1889). The Court opined:

It is clear that a payment of any sum in settlement of a claim for an alleged infringement cannot be taken as a standard to measure the value of the improvements patented, in determining the damages sustained by the owners of the patent in other cases of infringement. Many considerations other than the value of the improvements patented may induce the payment in such cases. The avoidance of the risk and expense of litigation will always be a potential motive for a settlement.

130 U.S. at 167.

²⁰² *See* Chapman, *supra* note 200, at 346–50; *see also* Fogarty et al., *supra* note 196, at 4–5.

²⁰³ *See* Fogarty et al., *supra* note 196, at 3–4.

²⁰⁴ *See* Chien & Schulman, *supra* note 46, at 222.

For example, in *Lucent*, the Federal Circuit found that running royalty agreements were not shown to be sufficiently similar to a lump-sum damages award in that case to support the jury's verdict.²⁰⁵ Similarly, the *ResQNet.com* court found that the majority of the licenses were "re-branding or re-bundling licenses"²⁰⁶ that were quite different from a hypothetical bare license transfer.²⁰⁷ And in *Wordtech Systems, Inc. v. Integrated Networks Solutions, Inc.*,²⁰⁸ the Federal Circuit found flaws similar to those in *Lucent* and *ResQNet.com*. In this regard, it found that the lump-sum verdict was not supported, as only two of the thirteen licenses were lump sum agreements, and "neither license describe[d] how the parties calculated each lump sum, the licensees' intended products, or how many products each licensee expected to produce."²⁰⁹ It also found that the licenses offered the jury "little more than a recitation of royalty numbers."²¹⁰ And it found that the eleven running royalty licenses could be relevant to lump-sum damages, but "some basis for comparison must exist in the evidence presented to the jury . . . the remaining licenses reveal no such basis."²¹¹

If, after consideration of all factors, a "comparable" license is considered to be sufficiently similar to the hypothetical license to provide useful and probative information concerning the value of the use of the patented technology-at-issue, then the royalty rate or rates reflected in that license should be further examined to adjust and apportion the rate to isolate the portion of the rate that is attributable to the patented technology.

b. Incremental Benefit Estimates

In addition to comparable licenses, incremental benefits analyses that seek to estimate the incremental benefits associated with and/or attributable to the patented technology-at-issue are often used in the determination of baseline royalty rates.²¹² As with comparable licenses, courts have imposed heightened

²⁰⁵ See *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1329–30 (Fed. Cir. 2009).

²⁰⁶ *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 870 (Fed. Cir. 2010).

²⁰⁷ *Id.*

²⁰⁸ 609 F.3d 1308, 1320 (Fed. Cir. 2010) ("We explained in *Lucent* that lump-sum licenses are generally more useful than running-royalty licenses for proving a hypothetical lump sum because 'certain fundamental differences exist between lump-sum agreements and running-royalty agreements.'" (citing *Lucent Techs.*, 580 F.3d at 1330).

²⁰⁹ *Id.*

²¹⁰ *Id.*

²¹¹ *Id.*

²¹² Consideration of incremental benefits analyses in assessing the reasonable royalty rate is typically considered pursuant to the Factor 13 of the *Georgia-Pacific* factors. See *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) ("13. The portion of the realizable profit that should be credited to the invention as distinguished from

requirements in recent years upon royalty rates derived from such analyses in ways that increase the likelihood that the royalty rates are consistent with the incremental value contributed by the patented technology.

An important milestone in the legal treatment of royalty rate evidence based on incremental benefits analysis was the Federal Circuit's 2011 decision in *Uniloc USA, Inc. v. Microsoft Corp.*,²¹³ in which, among other things, the court held that, "as a matter of Federal Circuit law that the 25[%] rule of thumb is a fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation . . . because it fails to tie a reasonable royalty base to the facts of the case at issue."²¹⁴ In that case, the plaintiff's economic expert allocated 25% of the value of the accused product to the patented technology based on the "25[%] rule of thumb," a commonly-used tool at the time for allocating profits between patented technology and other contributors of value.²¹⁵ The court rejected this allocation because "[t]he rule does not say anything about a particular hypothetical negotiation or reasonable royalty involving any particular technology, industry, or party"²¹⁶ and the terms of the allocation were not dependent on evidence of the actual contribution of the patented technology.²¹⁷

The courts' insistence on case-specific evidence in analyzing reasonable royalty damages was underscored in *ResQNet.com v. Lansa*,²¹⁸ where the Federal Circuit directed:

[T]he trial court must carefully tie proof of damages to the claimed invention's *footprint in the market place* . . . [because] evidence unrelated to the claimed invention does not support compensation for infringement but punishes beyond the reach of the statute.²¹⁹

non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer.").

²¹³ 632 F.3d 1292 (Fed. Cir. 2011).

²¹⁴ *Id.* at 1315.

²¹⁵ *Id.* at 1311–13.

²¹⁶ *Id.* at 1317.

²¹⁷ *See id.*

²¹⁸ 594 F.3d 860 (Fed. Cir. 2010).

²¹⁹ *Id.* at 869 (emphasis added); *see also* *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1318 (Fed. Cir. 2011); *i4i Ltd. P'ship & Infrastructures for Info. Inc. v. Microsoft Corp.*, 589 F.3d 1246, 1246 (Fed. Cir. 2009); *Oracle America, Inc. v. Google Inc.*, 798 F. Supp. 2d 1111, 1115 (N.D. Cal. 2011); *IP Innovation LLC v. Red Hat, Inc.*, 705 F. Supp. 2d 687, 690 (E.D. Tex. 2010). Courts have rejected the use of imprecise "haircuts" to a royalty rate that is aimed at adjusting for an overly-inclusive royalty base. According to the Eastern District of Texas in *Mirror Worlds v. Apple*, "[a]pportionment cannot be achieved by the mere downward adjustment of the royalty rate in a purported effort to reflect the relative value of the accused features *Mirror Worlds* cannot simply apply 'haircuts' adjusting the royalty rate to apportion damages." 784 F. Supp. 2d 703, 724 (E.D. Tex. 2011) (citations omitted).

As a practical matter, the footprint of the patent in the marketplace needs to be assessed from an economic perspective (*e.g.*, the patented invention must be shown to have incremental benefits from the perspective of the consumer).²²⁰ In *LaserDynamics*, for example, the Federal Circuit affirmed the exclusion of the patent holder's expert, in part, because he "never conducted any market studies or consumer surveys to ascertain whether demand for a laptop is driven by the patented technology."²²¹

3. Modification of Baseline Royalty Rate

In most circumstances, the conditions that gave rise to the baseline royalty rate are sufficiently different from the assumptions reflected in the hypothetical negotiation to require some degree of adjustment and/or apportionment to make the baseline royalty rate reflect the incremental value associated with the use of the patented technology at issue. In this context, the term "adjustments" refers to incremental changes in the level of the overall baseline royalty rate that are needed to account for systematic differences between the source of the baseline rate and hypothetical negotiation, while the term "apportionment" refers to segregating the adjusted baseline rate between value that reflects value contributed by the patented technology and value contributed by other sources of value.

a. Adjustments

A number of differences between a "comparable" license and the hypothetical license are likely to introduce potential bias in the baseline royalty rate that should (to the extent possible) be accounted for in the determination of the reasonable royalty rate. Two of the common adjustments involve the presumed legal status of the patented technology at the time of the negotiation and the relationship between the parties to the relevant licenses.

(1). Patent Status—Valid, Enforceable and Infringed

The most important difference between a "comparable" license and the hypothetical license is often the assumed legal status of the patent to be licensed. In the hypothetical license, the patent is assumed to be valid, enforceable and infringed ("VEI"), while in a "comparable license" negotiation, the parties' understanding of the strength of the licensed patent is usually unknown.²²²

As a general matter, it is reasonable to assume that a patent that is known to be VEI is more valuable than one that is not. There are substantial

²²⁰ See, *e.g.*, *Uniloc USA, Inc.*, 632 F.3d at 1320; *Inventio AG v. Otis Elevator Co.*, 06 Civ. 5377, 2011 U.S. Dist. LEXIS 88965, at *14–15 (S.D.N.Y. June 22, 2011).

²²¹ *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 69 (Fed. Cir. 2012).

²²² See *Jarosz & Chapman*, *supra* note 28, at 796–98.

disagreements, however, about how to quantify and incorporate this potential difference in value into a determination of reasonable royalty damages (*i.e.*, whether and how much a “comparable” license rate should be adjusted to reflect this difference).²²³

As a practical matter, an enhancement to account for a finding that a patent is VEI is appropriate only in those instances in which real-world licenses are used as a benchmark *and* when those licenses can be shown to reflect a discount due to uncertainties about the strength of the licensed patent.²²⁴ Under those circumstances, there is higher chance that the “baseline” royalty rate reflects some discount due to the status of the patent at the time of the agreement that may need to be eliminated.

Calculating an appropriate adjustment to real-world licenses has proven to be difficult for a number of reasons, often because it is unclear how patent validity, enforceability, or infringement affects comparable license rates.²²⁵ As a result, expert witnesses often disagree about the level of enhancement that might be appropriate. Sometimes their disagreement is resolved through resort to general industry studies, some of which have been interpreted to suggest a multiplier of double to quadruple of comparator license terms.²²⁶ Unfortunately, that range itself is quite broad and the underlying studies are across industries, companies, technologies, and time.

²²³ *Id.*; see also Cotter et al. (2019), *supra* note 68, at 36–39 (highlighting issues of excessive discounting that can arise in actual licenses due to possible non-infringement and possible inflation of royalty rates in actual licenses due to potential hold-up).

²²⁴ Whether a given comparable license reflects such a discount is a case-specific and license-specific question, as not all “comparable” licenses are likely to reflect such a discount. For example, a settlement license reached after a court determination of VEI is unlikely to reflect any discount.

²²⁵ See Stephen H. Kalos & Jonathan D. Putnam, *On the Incomparability of ‘Comparables’: An Economic Interpretation of ‘Infringer’s Royalties,’* 9 J. PROPRIETARY RTS. 2 (1997); see also Cotter et al. (2019), *supra* note 68, at 36–39.

²²⁶ See John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185, 205 (1998) (finding that 46% of patents litigated to judgment are invalidated); Paul M. Janicke & LiLan Ren, *Who Wins Patent Infringement Cases?*, 34 AIPLA Q.J. 1, 8 tbl. 1 (2006) (because patentees must win on all issues to prevail, they ultimately win only a small percentage of cases—24% in the Federal Circuit.); Edward F. Sherry & David J. Teece, *Royalties, Evolving Patent Rights, and the Value of Innovation*, 33 RES. POL’Y 179, 183 (2004) (“[A] proven-valid-and-infringed patent is a different, and more valuable, economic commodity that ‘the same’ patent for which the issues of validity and infringement have not yet been resolved.”); Kimberly A. Moore, *Judges, Juries, and Patent Cases—An Empirical Peek Inside the Black Box*, 99 MICH. L. REV. 365, 390 tbl. 4 (2000) (finding that 35% of patents litigated to judgment are not infringed).

(2). Negotiating Party Relationship

Another potential difference between the comparable license negotiating context and the hypothetical negotiation is the nature of the relationship between the negotiating parties, in particular, whether the negotiating parties are direct competitors for products that use the patented technology.²²⁷ Accordingly, if the “comparable” license was negotiated between parties who were not direct competitors but the hypothetical negotiation involves direct competitors, then the baseline royalty rate may understate the royalty rate that would emerge from a hypothetical negotiation, and may justify an upward adjustment of the baseline royalty rate.

b. Apportionment

In addition to adjusting the baseline rates to account for *overall* differences that might bias the level of baseline royalty rates relative to the rates that would emerge from a hypothetical negotiation, it is often necessary to *apportion* the *adjusted* baseline rate to arrive at a reasonable royalty rate that separates compensation paid for permission to use of the patented technology from compensation paid for other consideration provided by the licensor (such as permission to use other patents, permission to use other types of intellectual property, support services, or a materials reduction/elimination of litigation expenses).²²⁸ Several circumstances give rise to the need for such apportionment, including the licensing of rights beyond a naked license to the infringed patent in the comparable license and the litigation posture of the infringement case at the time of the settlement.

(1). Additional Rights

The hypothetical license used to evaluate reasonable royalty damages is assumed to be a “naked” license to the patented technology at issue in the litigation; it does not provide any rights to other patented technology, access to other kinds of intellectual property (*e.g.*, know-how, trademarks), or any other benefit from the licensor (*e.g.*, technical support).²²⁹ Accordingly, an important point of comparison between the hypothetical license and any proposed “comparable” license is whether the proposed comparable license confers rights on the licensee that goes beyond a naked license to the patented technology at issue.

For potential “comparable” licenses that include rights and other valuable consideration beyond a naked license to the technology at issue,

²²⁷ This consideration factor is covered by *Georgia-Pacific* Factor 5. See *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (1970).

²²⁸ See *Intell. Prop. Owners Ass'n*, *supra* note 52, at 7 (“[T]he Federal Circuit has also recognized situations where apportioning through the royalty rate is required or appropriate.”).

²²⁹ See *Jarosz & Chapman*, *supra* note 28, at 819.

the determination of whether such licenses should even be used in the assessment of a reasonable royalty rate depends heavily on the extent of the additional rights that are licensed and the portion of overall license value that is attributable to the patented technology. For example, in circumstances where the technology at issue accounts for a very small (or indeterminate) portion of the value covered by the license, reliance on the “comparable” license as evidence of the reasonable royalty may not be appropriate at all.²³⁰ Moreover, in cases where both patent-specific licenses and licenses covering a wider range of technologies and benefits are available, greater weight is typically given to the patent-specific licenses in assessing the reasonable royalty rate because these licenses provide more direct evidence of the value of the patented technology at issue.²³¹

To the extent that “comparable” licenses that include additional rights are *not excluded* from consideration in the assessment of reasonable royalty damages, the “comparable” license royalty rates must be apportioned to separate the portion of the rate that is attributable to the patented technology and the portion that is attributable to other contributors of value.²³² As explained in *Ericsson, Inc. v. D-Link Systems, Inc.*:

[W]hen licenses based on the value of a multi-component product are admitted, . . . [t]he court should . . . ensure that the instructions fully explain the need to apportion the ultimate royalty award to the incremental value of the patented feature from the overall product.²³³

In the end, patent damages should be limited to the incremental value of the patented feature.

(2). *Legal Circumstances*

For some “comparable” licenses (most notably “settlement licenses” negotiated after the initiation of litigation), legal circumstances can have a significant effect on the terms of the “comparable” license that depart substantially from the hypothetical license.

²³⁰ *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 870–71 (Fed. Cir. 2010). The court opined:

[The asserted licenses] furnished finished software products and source code, as well as services such as training, maintenance, marketing, and upgrades, to other software companies in exchange for ongoing revenue-based royalties In simple terms, the [patent-in-suit] deals with a method of communicating between host computers and remote terminals, not training, marketing, and customer support services. The [asserted] licenses simply have no place in this case.

Id.

²³¹ *Id.*

²³² *See id.* at 871.

²³³ *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1228 (Fed. Cir. 2014).

An important consideration for settlement licenses is that an integral element and critical benefit of such a license is often the avoidance of litigation expenses for both sides.²³⁴ Depending on the status of the litigation at the time of the settlement, avoidance of such costs can profoundly affect the terms of the license, especially the payment terms.²³⁵ For example, a defendant facing a complicated and costly litigation may pay more than the incremental value of the patent-at-issue in a settlement to avoid incurring those costs. Conversely, a patent holder without substantial resources may accept in a settlement a royalty payment less than the incremental value of infringement to avoid the costs and delays (and uncertainties) associated with pursuing the litigation to completion. In fact, courts have historically been very reluctant to permit settlement licenses to be considered in assessing reasonable royalty damages due to concerns about the distortive effects of litigation expenses.²³⁶ More recently, however, courts have recognized that the litigation process can be very useful in informing the parties concerning the true value of a patented technology, such that settlement licenses entered into later in the litigation process can be highly valuable for the purposes of assessing the value of the patented technology for the purpose of determining reasonable royalty damages.²³⁷

For example, in *Prism Technologies, LLC v. Sprint Spectrum, L.P.*,²³⁸ the Federal Circuit noted that a royalty rate from a settlement agreement that was entered into at the end of litigation *enhanced* the reliability of the agreed-upon rate for reasonable royalty rate purposes, explaining:

The Agreement was entered into, not just after all discovery was complete, but after the entire trial was finished, except for closing arguments and jury deliberations. Thus, the record was fully developed and thoroughly tested in the adversarial process, enhancing the reliability of the basis on which Prism and AT&T were assessing the likely outcome.²³⁹

²³⁴ See Chapman, *supra* note 200, at 346–50.

²³⁵ See Stephen J. Conroy et al., *The Case For Admitting Settlement License Agreements in a Reasonable Royalty Analysis*, LES NOUVELLES, Dec. 2011, 291–98.

²³⁶ See *ResQNet.com*, 594 F.3d at 872.

²³⁷ See, e.g., *id.* (“This court observes as well that the most reliable license in this record arose out of litigation.”); see also Chapman, *supra* note 200, at 355 (“[A] settlement license negotiated sufficiently late in the litigation process may be negotiated under circumstances that closely approximate the conditions assumed for a hypothetical license—with little or no uncertainty regarding validity, enforceability and infringement.”); Conroy et al., *supra* note 235, at 294.

²³⁸ 849 F.3d 1360 (Fed. Cir. 2017).

²³⁹ *Id.* at 1370–71.

Moreover, for settlements made toward the end of the litigation process, most litigation expenses may have already been incurred, thereby reducing the potential impact of such expenses on the negotiation royalty rate.²⁴⁰

Another legal circumstance that may distort negotiated license rates is the existence of potential legal penalties that could generate substantial damages that have nothing to do with the underlying value of the patented technology. For example, in *LaserDynamics, Inc. v. Quanta Computer, Inc.*, the court rejected reliance on a potentially comparable settlement license because the settlement occurred in the shadow of severe legal and procedural disadvantages faced by the defendant that may have caused the defendant to over-pay (relative the incremental benefit of the using the patent) for rights to the patented technology.²⁴¹

As a practical matter, when settlement licenses that are used in the determination of reasonable royalty damages are likely to include non-patented elements of value such as avoided litigation costs, the rates reflected in such licenses need to be apportioned between the patented technology and the other sources of license value before the “comparable” license rates should be used in evaluating reasonable royalty damages.²⁴²

D. Hypothetical Negotiation

The third component of the apportionment process involved in the assessment of reasonable royalty damages is the hypothetical negotiation.²⁴³

²⁴⁰ *Id.* (“The timing of the settlement also means that a very large share of litigation costs had already been sunk, reducing (though of course not eliminating) the role of litigation-cost avoidance in the settlement decision.”).

²⁴¹ *LaserDynamics v. Quanta Comput., Inc.*, 694 F.3d 51, 77–78 (Fed. Cir. 2012). The court opined:

[T]he BenQ settlement agreement appears to be the least reliable license by a wide margin. The BenQ settlement agreement was executed shortly before a trial—a trial in which BenQ would have been at a severe legal and procedural disadvantage given the numerous harsh sanctions imposed on it by the district court LaserDynamics executed twenty-nine licenses for the patent-in-suit in total, the vast majority of which are not settlements of active litigation and do not involve the unique coercive circumstances of the BenQ settlement agreement, and which are therefore far more reliable indicators of what willing parties would agree to in a hypothetical negotiation.

Id. But cf. Jonathan S. Masur, *The Use and Misuse of Patent Licenses*, 110 NW. U. L.R. 115, 127 (2015) (suggesting the BenQ license represented the best estimate of the value of the patent-at-issue).

²⁴² See Chapman, *supra* note 200, at 346–50.

²⁴³ See Colice & Davis, *supra* note 59 (“There are many ways to apportion damages. For instance, the patent owner can apportion damages using the Georgia-Pacific factors, which try to capture a hypothetical negotiation between the patent owner and the infringer.”)

As discussed above, the hypothetical negotiation construct is a framework used to synthesize all relevant case information to enable the fact-finder to determine the reasonable royalty damages that would adequately compensate the patent holder for the unauthorized use of the patented technology at issue.²⁴⁴ From the perspective of apportionment, the hypothetical negotiation contributes to the proper assessment of patent value in three ways.

First, the hypothetical negotiation contributes to the apportionment process by carefully considering the contributions of both the patent holder and the infringer to the generation of infringing incremental and determines the share of overall value that should be allocated to each party. Such an allocation is particularly important where the use of the patented technology results in a substantial amount of Indirect/Synergistic value that should be shared between the parties such that there may be no definitive, objective means to allocate credit between the parties for the incremental value generate by infringement.

Some commentators have argued that apportionment of synergy-related value is likely to be arbitrary because there is no unique way or mechanical rule that guides such an allocation.²⁴⁵ Although there is an element of truth to this observation, the Federal Circuit has recognized that reasonable royalty damages “analysis necessarily involves an element of approximation and uncertainty” and simply requires that “a trier of fact must have *some factual basis* for a determination of a reasonable royalty.”²⁴⁶ Consideration of the *Georgia-Pacific* factors by experts and the courts in the context of a hypothetical negotiation analysis is a common means of establishing that factual basis.

(citations omitted); *see also* *Sprint Commc'ns Co., L.P. v. Time Warner Cable, Inc.*, 760 F. App'x 977, 983 (Fed. Cir. 2019) (“[T] the objective of apportionment can be achieved in different ways, one of which is through the determination of an appropriate royalty by application of the so-called *Georgia-Pacific* factors.”); *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1348–49 (Fed. Cir. 2018) (citations omitted).

²⁴⁴ *Jarosz & Chapman*, *supra* note 28, at 782–85. The Federal Circuit in *Exmark* wrote:

We hold that such apportionment can be done in this case through a thorough and reliable held in 2018 analysis to apportion the royalty rate. We have recognized that one possible way to do this is through a proper analysis of the *Georgia-Pacific* factors. As we have explained, “the standard *Georgia-Pacific* reasonable royalty analysis takes account of the importance of the inventive contribution in determining the royalty rate that would have emerged from the hypothetical negotiation.”

879 F.3d at 1348–49 (internal citations omitted); *see also* *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1228 (Fed. Cir. 2014) (noting that the *Georgia-Pacific* factors “do take the concepts of apportionment into account to some extent”).

²⁴⁵ *See* *Bailey et al.*, *supra* note 1, at 262.

²⁴⁶ *Unisplay, S.A. v. Am. Elec. Sign Co.*, 69 F.3d 512, 517 (Fed. Cir. 1995) (emphasis added).

Second the hypothetical negotiation contributes to the apportionment process by ensuring that the proposed combination royalty base and royalty rate generates an economically sensible damages estimate, essentially providing a reality check that should ensure proposed damages amounts are reasonable. As an economic matter, the assumption that reasonable royalty damages should result from a negotiation between a *willing licensee* and *willing licensor* should constrain the terms the reasonable royalty to a range of values that allows *both parties* to be better off (or, at least, no worse off) as a result of the license than they would be if no agreement had been reached.²⁴⁷ In this regard, for a licensor to be a *willing licensor*, the licensor must not be made worse off as a result of the license than it would have been without a license.²⁴⁸ Accordingly, if the royalty rate that could be received by the patent holder is less than the opportunity cost of granting the license, it would not be economically sensible for a willing licensor to grant a license. Similarly, for a party to be a *willing licensee*, the licensee must be better off as a result of taking a license than it would have been without a license, because it would not be economically sensible to pay more for the use of a technology than the value obtained from using that technology. Simply put, “[t]he maximum royalty that the licensee would be willing to pay equals the added increment of profit that the licensee could expect to earn by licensing the patent in suit rather than using the next-best non-infringing substitute available at the time of the hypothetical negotiation.”²⁴⁹

Given these constraints, a “royalty base-royalty rate” combination that yields a damages estimate that is not within the range of plausible agreement between a reasonable patent holder and a reasonable infringer is a strong indication that there is a problem with one or both of the components of the calculation that should be addressed.

The third way the hypothetical negotiation contributes to the apportionment process is that it focuses attention on the ultimate question: How much compensation is needed to *adequately compensate the patent holder for the infringement?*²⁵⁰ Given this question, the assessment of reasonable royalty

²⁴⁷ See Sidak, *supra* note 190, at 10–13.

²⁴⁸ See *id.* at 13. Sidak states:

The licensor’s minimum willingness to accept depends on its opportunity cost of licensing the patent in suit to the would-be infringer at the time of the hypothetical negotiation. This opportunity cost is determined by the profits that the licensor can earn by not issuing a license and by instead pursuing alternative licensing agreements that the licensor would forgo by licensing the patent in suit to the would-be licensee.

Id.

²⁴⁹ *Id.* at 15.

²⁵⁰ See 35 U.S.C. § 284 (2006); see also *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1349 (Fed. Cir. 1999) (“The phrase ‘damages adequate to compensate’ means

damages requires not only an evaluation of the total incremental value generated by using the patented technology, but also a determination as to how this value should be shared between the patent holder and the infringer. The hypothetical negotiation construct suggests that the determination of the allocation of incremental value between the parties should be based, at least in part, on consideration of a bargaining process between them.²⁵¹ As discussed above, the outcome of the negotiation should leave each party better off than they would be in the absence of an agreement and is likely to result in some degree of sharing of the Indirect or Synergistic incremental benefits generated by the use of the patented technology.

E. Summary

Applied correctly, the three components of the apportionment process—apportionment of the royalty base, apportionment of the royalty rate, and the use of the hypothetical negotiation construct—should work together to achieve the *Garretson* requirement “to separate or apportion the defendant’s profits and the patentee’s damages between the patented feature and the unpatented features”²⁵² with a sufficient degree of certainty and accuracy to support a reasonable royalty damages determination. In particular, the combination of these analytical components should:

1. isolate the incremental value associated with the use of the patented technology;
2. exclude incremental value generated by other contributors of value; and
3. determine a reasonable allocation of the benefits of using the patented technology between the patent holder and the infringer.

Conclusion

The rules concerning apportionment in reasonable royalty damages determinations have undergone substantial refinement and evolution in recent years. However, to date, courts have not clearly articulated the underlying principles that govern this development.

Given that “[t]he essential requirement [for reasonable royalty damages awards] is that the ultimate reasonable royalty award must be based on the

‘full compensation for “any damages” [the patent owner] suffered as a result of the infringement.’”) (quoting *Gen. Motors Corp. v. Devex Corp.*, 461 U.S. 648, 654–55 (1983)).

²⁵¹ See Sidak, *supra* note 190, at 13; see also Jarosz & Chapman, *supra* note 28, at 810–827; Michael J. Chapman and John J. Jarosz, *Application of Game Theory to Intellectual Property Royalty Negotiations*, LICENSING BEST PRACTICES: STRATEGIC, TERRITORIAL & TECH. ISSUES 241–65 (2006).

²⁵² *Garretson v. Clark*, 111 U.S. 120, 121 (1884) (citing *Garretson v. Clark*, 10 F. Cas. 40, 41 (N.D.N.Y. 1878)).

incremental value that the patented invention adds to the end product,”²⁵³ it is reasonable to assume that the underlying principle governing the use of apportionment in assessing reasonable royalty damages should be to ensure that the damages that emerge from the application of apportionment rules should approximate the incremental value attributable to the use of the patented technology. The “best” way to achieve that result will depend on the evidence and circumstances governing each case and should involve some combination of an apportioned royalty base, an apportioned royalty rate, and careful consideration of the manner in which value generated by the use of the patented technology should be shared between the patent holder and the infringer (*e.g.*, using a hypothetical negotiation). In every case, each aspect of the damages analysis should be considered in context to ensure that the resulting damages make economic sense.

²⁵³ *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014).
