PATENT CLAIM APPORTIONMENT, PATENTEE INJURY, AND SEQUENTIAL INVENTION

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INTRODUCTION

A well-functioning patent system that fosters, or at least does not impede, the creation of new scientific inquiry is essential. Presently, patent damages have become the fulcrum of a debate about incentives, job growth, necessary solutions to pressing technological problems, and the costs of scientific advance.[1] At the heart of this inquiry is the question of how much patents are worth.

Reasonable royalty relief is currently the most prevalent type of recovery for patent infringement, and its use grows every year.[2] Doubts about the efficacy of the legal standards to derive the reasonable royalty have recently multiplied.[3] Congress began to formulate solutions, but those efforts have

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1 *See* S. REP. NO. 111-18, at 9 (2009) ("[C]ommentators have correctly questioned whether juries are being properly advised on the evidence and factors to consider when determining damages."); S. REP. NO. 110-259, at 12 (2008) (noting that jurors "lack adequate legal guidance to assess the harm to the patent holder caused by patent infringement"); H.R. REP. NO. 110-314, at 25 (2007) (the application of the reasonable royalty test "often results in the misapplication of these factors and damage awards that are neither just nor related to the statutory standard"); *see also, e.g.*, Daralyn J. Durie & Mark A. Lemley, *A Structured Approach to Calculating Reasonable Royalties*, 14 LEWIS & CLARK L. REV. 627, 628 (2010) (stating that the prevailing legal test for the reasonable royalty calculation "overloads the jury with factors to consider that may be irrelevant, overlapping, or even contradictory" and is rarely corrected through judicial review); John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 525 (2010) (asserting that patent valuation has entered a "[s]lough of [d]espond").

2 PRICEWATERHOUSECOOPERS, THE CONTINUED EVOLUTION OF PATENT DAMAGES LAW: PATENT LITIGATION TRENDS 1995-2009 AND THE IMPACT OF RECENT COURT DECISIONS ON DAMAGES 12 (2010), http://www.pwc.com/us/en/forensic-services/publications/2010-patent-litigation-study.jhtml.

3 *See, e.g.*, *Patent Reform Act of 2009: Hearing Before the H. Comm. on the Judiciary on H.R. 1260*, 111th Cong. 77 (2009) [hereinafter *Hearing*] (statement of John R. Thomas, Professor, Georgetown University) ("Excessive damages awards effectively allow inventors to obtain proprietary interests in products they have not invented, promote patent speculation and litigation, and place unreasonable royalty burdens upon producers of high technology products. Such consequences may ultimately slow the process of technological innovation . . . .").

collapsed due to an inability to reach a consensus.[4] Today, there are few reasons to believe that jury awards represent an accurate reflection of the value of the technology used by the infringer. Instead, reasonable royalty awards have delivered inexplicably harsh results in a system in which the infringer may be liable for an amount disproportionate to the harm caused. For example, in some instances, royalty rates exceed the infringing product's selling price.[5] Rather than creating a system that carefully balances the rights of patent holders against those of subsequent improvers, the patent system has granted the biggest wins to nonpracticing entities, who inexplicably obtain jury awards that average three times those of patentees who practice their inventions.[6]

This Article starts with the fundamental premise that a patentee's harm cannot be greater than the patentee's contribution. Building on this principle, a framework is provided to align reasonable royalty damages with the compensatory purpose of the governing statute. Apportionment is the correct starting point. It establishes the necessary relationship between the reasonable royalty and the patentee's contribution.

Currently, this crucial step is missing. Reasonable royalty law never asks the gating question that requires identification of the technology that is the subject of an award.[7] Apportionment does so by requiring definitional isolation of the patentee's contribution to an art before valuation of the infringed claim.[8] By requiring scrutiny of the inventive aspect of the infringed claim, apportionment helps to reduce the random, and therefore troubling, disconnect between damage awards and the patentee's injury.[9]

As originally conceived by the courts, the reasonable royalty incorporated apportionment. Notably, this principle was important background to

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4 *See, e.g.*, Patent Reform Act of 2009, H.R. 1260, 111th Cong. § 5 (2009) (referring to the "claimed invention's specific contribution over the prior art"); Patent Reform Act of 2009, S. 515, 111th Cong. § 4 (2009) (same); Patent Reform Act of 2007, H.R. 1908, 110th Cong. § 5 (2007) (referring to "the patent's specific contribution over the prior art"); Patent Reform Act of 2007, S. 1145, 110th Cong. § 5 (2007) (same); *Patent Reform in the 111th Congress: Legislation and Recent Court Decisions: Hearing Before the H. Comm. on the Judiciary*, 111th Cong. 166 (2009) (statement of Philip S. Johnson, Chief Intellectual Property Counsel, Johnson & Johnson) (observing that, "after years of trying, no substantive language has been proposed that has gained widespread support").

5 *See* i4i Ltd. P'ship v. Microsoft Corp., 598 F.3d 831, 853-54 (Fed. Cir. 2010) (affirming a per-unit $98 award for an infringing product that sold for $97), *aff'd*, 131 S. Ct. 2238 (2011). Other Federal Circuit cases have affirmed that reasonable royalty awards may exceed the defendant's expected or actual profit. *See* Monsanto Co. v. McFarling, 488 F.3d 973, 978-81 (Fed. Cir. 2007) (affirming reasonable royalty damages of more than six times Monsanto's lost profits); Monsanto Co. v. Ralph, 382 F.3d 1374, 1383-84 (Fed. Cir. 2004) (approving a similar award); Golight, Inc. v. Wal-Mart Stores, Inc., 355 F.3d 1327, 1338-39 (Fed. Cir. 2004) (upholding a reasonable royalty award that exceeded the infringer's profits).

6 PRICEWATERHOUSECOOPERS, *supra* note 2, at 7-8.

7 *See infra* Part III.B.3.

8 *See infra* Part I.

9 *See infra* notes 34-36 and accompanying text.

the statutory adoption of the reasonable royalty during the early part of the twentieth century.[10] Yet the U.S. Court of Appeals for the Federal Circuit has explicitly rejected apportionment in more recent decades.[11] Today, the prevailing method courts use to calculate a reasonable royalty, the *Georgia-Pacific Corp. v. U.S. Plywood Corp.*[12] test, includes consideration of the patentee's contribution as one factor of fifteen.[13] These considerations are folded together in a manner that loses this crucial causative link in a malleable, and virtually unreviewable, verdict amount.[14] Jury instructions do not ask the fact finder to identify the invention to be valued.[15] Federal Circuit decisions frame the inquiry as providing the patentee with economic compensation for infringement of the "claimed invention"[16] or "patented feature."[17] This suggests that compensation is being erroneously awarded for use of a full claim scope, even where significant portions of the claim are in the prior art, owned by third parties, or part of the public domain.

This Article proposes carrying out the original purpose of the damages statute by implementing apportionment. To do so, the patentee's contribution would be isolated according to the general method used in the 1966 *Graham v. John Deere Co.*[18] inquiry.[19] Specifically, the first *Graham* step requires isolation of the inventive aspects of the infringed claim by examining "the scope and content of the prior art" and identifying the "differences between the prior art and the claims at issue."[20] This step ensures that the intellectual property of third parties, the public domain, and the inventor's

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10 Erick S. Lee, *Historical Perspectives on Reasonable Royalty Patent Damages and Current Congressional Efforts for Reform*, UCLA J.L. & TECH., Fall 2009, at 1, 9-11.

11 *See, e.g.*, Fromson v. W. Litho Plate & Supply Co., 853 F.2d 1568, 1578 (Fed. Cir. 1988).

12 318 F. Supp. 1116 (S.D.N.Y. 1970).

13 *See id.* (listing factor nine as "[t]he utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results").

14 Durie & Lemley, *supra* note 1, at 628 ("[B]ecause the jury's finding is the result of such a complex, multi-factor test, it is as a practical matter almost entirely immune from scrutiny by either district or appellate judges facing a deferential standard of review.").

15 *See, e.g.*, MODEL PATENT JURY INSTRUCTIONS §§ 6.6-6.7 (Fed. Circuit Bar Ass'n 2010); MODEL PATENT JURY INSTRUCTIONS § 6.6 (Nat'l Jury Instruction Project 2008); AIPLA'S MODEL PATENT JURY INSTRUCTIONS §§ 12.15-12.17 (Am. Intellectual Prop. Law Ass'n 2008); MODEL PATENT JURY INSTRUCTIONS FOR THE N. DIST. OF CALIFORNIA § 5.7 (Working Comm. 2007).

16 *See* ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010) (per curiam); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1334 (Fed. Cir. 2009) (assessing a reasonable royalty, noting that the law has "the requisite focus on the *infringed claim*" (emphasis added)).

17 *Lucent Techs.*, 580 F.3d at 1332.

18 383 U.S. 1 (1966).

19 *Id.* at 17-18; *see also* KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 406-07 (2007); Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248, 265-67 (1851) (finding that switching known materials is an improvement "destitute of ingenuity" that cannot be the subject of a patent).

20 *Graham*, 383 U.S. at 17.

prior art are excluded to avoid stacking values attributable to multiple inventive inputs.[21]

Some illustrations demonstrate the importance of the interests at stake. As background, there is a delicate, yet critically important, interaction between the scope of a patentable invention and the existing state of information at the time of invention. Patents are granted for inventions that are improvements on existing devices.[22] A claim may be valid even if made entirely of elements that independently exist in the art.[23] Under current peripheral claiming practice, claims are complete descriptions of an invention and commonly sweep in aspects of the prior art and knowledge that exists at the time of invention. For example, a claim to an element of a computer system includes terms—such as "computer" or "screen"—that are already present in the art at the time of invention.[24]

Other claims have more subtle, nontextual connections to the prior art. For example, a 1932 Kodak patent described and claimed color photography using sensitized film.[25] This invention conceptually builds on George Eastman's 1844 invention of a light-sensitive, black-and-white gelatinous film[26] and, even further back, Nicéphore Niépce's 1824 early monochromatic creation now considered to be the first photograph.[27] Similarly, the invention of the spiral-shaped compact fluorescent light bulb in the 1970s, designed as an energy-efficient alternative to incandescent bulbs, is a physical reconfiguration of long, florescent tubes developed by a first-generation inventor in the 1930s.[28] In each, the invention represents a contribution to

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21 Stacking can occur where multiple inventive inputs are added together. *See* Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1993 (2007) (defining stacking as the term relates to royalties for a product that incorporates inventions from multiple patents).

22 *See* 35 U.S.C. § 101 (2006) (defining patentable subject matter as including "any new and useful improvement" of a "process, machine, manufacture, or composition of matter").

23 *See* United States v. Adams, 383 U.S. 39, 51-52 (1966) (stating that the combination of elements that are well-known in the prior art is patentable).

24 *E.g.*, ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 867-68 (Fed. Cir. 2010) (per curiam); U.S. Patent No. 6,295,075 (filed July 10, 1997).

25 U.S. Patent No. 2,059,884 col. 14 ll. 12-31 (filed Sept. 21, 1932) (referring to "sensitized layers" and "sensitive film").

26 U.S. Patent No. 306,470 (filed May 10, 1884).

27 BEAUMONT NEWHALL, THE HISTORY OF PHOTOGRAPHY 15-17 (5th ed. 1982) (describing Niépce's invention).

28 This invention has been credited to an engineer named Edward Hammer. *Compact Fluorescent: The Challenge of Manufacturing*, NAT'L MUSEUM AM. HIST., http://americanhistory.si.edu/lighting/20thcent/invent20.htm#in4 (last visited Nov. 4, 2011). Hammer's employer, General Electric, decided not to patent Hammer's bulb, but a similar patent was granted to Thomas Giudice. *See* U.S. Patent No. 3,953,761 (filed Apr. 3, 1974). Claim 1 of that patent reads:

> A fluorescent light bulb adapted for use in an incandescent lamp fixture comprising, a central ballast, a socket plug electrically connected to said ballast and adapted to be received in the socket of an incandescent lamp fixture, and a fluorescent tube containing a gas discharge vapor and having an interior surface coated with a fluorescent material, said tube comprising means defining a relatively flat toroid which is generally complementary to the periphery of

existing knowledge. This reflects the circumstance that science is built on antecedents; every invention incorporates something that came before.[29]

In each of these examples, the pre-existing knowledge was almost certainly in the public domain. To take the second example one step further to clearly illustrate apportionment, assume a third-generation inventor, unaware that a patent is in force for a spiral-shaped fluorescent light bulb, makes a compact fluorescent light and adds an improved unbreakable glass. It is disconcerting to suppose that this third-generation inventor must pay the patentee for both the patented advance as well as the original invention of the fluorescent light created decades earlier by another. Yet under present standards, the innocent infringer might well pay for both. However, if apportionment is applied, the innocent infringer pays damages based only on the value of the spiral shape developed by the patentee as an improvement but not for the work of the first generation discoverer.

As the Supreme Court recognized, invention arises from pre-existing informational inputs.[30] Scientific advance vitally depends on the examination of prior work, which reveals foundations, gaps, anomalies, and areas for future growth. The myth that "useful, creative products spring fully formed into an inventor's head" disregards the reality that all creative products build on a foundation of existing information.[31] Typically, claims include a mix of the inventor's contribution with the invention's operative context, as derived from third parties. Apportionment balances the rights of patentees with the responsibilities of later users of the patented technology by ensuring proper compensation and avoiding penalization via a royalty based on third-party technology.[32] Properly implemented, it moves toward

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> said ballast and surrounding said central ballast and being electrically connected to said ballast thereby to form a compact fluorescent light bulb assembly.

Id. at col. 7 ll. 27-38.

29 *See* DEAN KEITH SIMONTON, CREATIVITY IN SCIENCE: CHANCE, LOGIC, GENIUS, AND ZEITGEIST 171 (2004); Amy L. Landers, *Ordinary Creativity: The Artist Within the Scientist*, 75 MO. L. REV. 1, 37-42 (2010) (surveying literature from the field of scientific creativity and finding that advances derive from building blocks of information and ideas that came before); Todd I. Lubart, *Models of the Creative Process: Past, Present and Future*, 13 CREATIVITY RES. J. 295, 301 (2000-2001) ("What is important for creative work is the quality of the material (e.g., knowledge) . . . ."); Thomas B. Ward et al., *Creative Cognition*, *in* HANDBOOK OF CREATIVITY 189, 195 (Robert J. Sternberg ed., 1999).

30 *See* KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 417 (2007) ("[A] court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.").

31 David Cropley & Arthur Cropley, *Functional Creativity: "Products" and the Generation of Effective Novelty*, *in* THE CAMBRIDGE HANDBOOK OF CREATIVITY 301, 305-06 (James C. Kaufman & Robert J. Sternberg eds., 2010); *see also* Mark A. Lemley, *The Economics of Improvement in Intellectual Property Law*, 75 TEX. L. REV. 989, 997-98 (1997). *See generally* JAMES BOYLE, SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY 51-60 (1996) (describing the myth of the romantic author).

32 *See infra* notes 34-36 and accompanying text.

minimizing royalty stacking for overlapping intellectual property rights owned by more than one party.

Critically, apportionment is not intended to lower the value of reasonable royalty awards overall. This point requires an appreciation of the distinction between the identification of the invention to be valued and the valuation method. Apportionment addresses the former—that is, the isolation of the inventive contribution.[33] The latter step that considers the appropriate value attributable to an invention is a separate inquiry. An invention that represents a significant advance in an art is expected to retain a high value. However, a claim that represents a more modest achievement is expected to be valued closer to its actual worth.

Part I of this Article defines apportionment and demonstrates how the standard must be applied to effectuate the aims of patent law. In Part II, the Article sets forth a theory for patentee injury and concludes that apportionment is the correct approach to providing patentees with full compensation for the injury caused by patent infringement. Part III construes the patent damages statute in light of the historical and statutory underpinnings of patent remedies. In addition, this third Part shows that the proper construction of the current statute requires claim apportionment. Part IV establishes that apportionment is necessary to foster sequential invention. Part V proposes that apportionment be considered an issue properly submitted to the court, rather than to a jury.

I. DEFINING APPORTIONMENT

As previously indicated, apportionment requires an examination of the differences between the infringed claim and the prior art in a manner analogous to the identification of the differences between the claimed invention and the prior art in the nonobviousness analysis.[34] This approach requires an evaluation of the infringed claim's advance over existing knowledge, separated from the value of the claim as a whole. Once the claim's contribution is isolated, it can be valued.[35] This mechanism provides a solution to the compensation problem created for "clever claims"—that is, claims in which a patentee has added exogenous elements to the claim to expand the royalty base.[36] If apportionment is properly applied, a software claim that adds a

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33 *See infra* notes 34-35 and accompanying text.

34 *See, e.g.*, *KSR Int'l*, 550 U.S. at 417; Graham v. John Deere Co., 383 U.S. 1, 17 (1966).

35 Although this Article does not address valuation, it should be observed that determining the level of harm "requires sound economic proof." *See, e.g.*, ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010) (per curiam) (quoting Grain Processing Corp. v. Am. Maize-Prods. Co., 185 F.3d 1341, 1350 (Fed. Cir. 1999)).

36 *See* Amy L. Landers, *Let the Games Begin: Incentives to Innovation in the New Economy of Intellectual Property Law*, 46 SANTA CLARA L. REV. 307, 360 (2006) (noting that "patentees drafting

general purpose computer as a limitation at a time general purpose computers are in the prior art would not entitle the patentee to include the computer in the royalty base. More broadly, apportionment eliminates overcompensation for nearly all claims that are extensions of pre-existing knowledge.

Compensating for the inventive contribution depends on the dissection of the inventor's contribution from the peripherally formatted claim. This can be performed using conceptual separation, wherein the court's claim construction identifies only the inventive aspects of the claim over the prior art. After doing so, if contributions remain from the prior art or prior knowledge, those aspects must be valued and subtracted from the prior figure to derive the total.

Apportionment is consonant with other areas of patent doctrine that rest on a claim's point of novelty.[37] For example, rules governing joint inventorship allow an individual to establish inventorship based on a contribution of a single point of novelty of an entire claim.[38] Other examples of this principle include contributory infringement[39] and exhaustion.[40] As an emerging body of scholarly literature recognizes, patent law's insistence on current peripheral claiming practices across all doctrines can interfere with results that are consistent with patent policy.[41] This is demonstrably true for reasonable royalty awards.

This point is illustrated by using the facts of *Spine Solutions, Inc. v. Medtronic Sofamor Danek USA, Inc.*,[42] in which the Federal Circuit considered claims to a spinal implant that relied on a single anchor point that allowed easier insertion and flexibility.[43] All of the elements of the claim were disclosed in the prior art, although none disclosed the combination in a single implementation.[44] The inventor was not the first creator of the con-

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improvement claims may be encouraged to include additional components in combination claims to sweep additional products within their scope" to increase their total recovery).

37 *See* Mark A. Lemley, *Point of Novelty*, 105 NW. U. L. REV. (forthcoming) (manuscript at 9-16), *available at* http://www.law.northwestern.edu/lawreview/issues/105.html.

38 *See* Pannu v. Iolab Corp., 155 F.3d 1344, 1350-51 (Fed. Cir. 1998) (finding that a party established an issue of fact for an intellectual contribution to a portion of a claim).

39 35 U.S.C. § 271(c) (2006) (stating that infringement can be based on sales or offers to sell "a material part of the invention"); Oxford Gene Tech. Ltd. v. Mergen Ltd., 345 F. Supp. 2d 444, 464-66 (D. Del. 2004).

40 Quanta Computer, Inc. v. LG Elecs., Inc., 553 U.S. 617, 635 (2008) (noting that exhaustion can be based on the sale of a product with all of the "essential features" of the patent).

41 Dan L. Burk & Mark A. Lemley, *Fence Posts or Sign Posts? Rethinking Patent Claim Construction*, 157 U. PA. L. REV. 1743, 1748-65 (2009); Bernard Chao, *Breaking* Aro*'s Commandment: Recognizing that Inventions Have Heart*, 20 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1183, 1197-99 (2010); Jeanne C. Fromer, *Claiming Intellectual Property*, 76 U. CHI. L. REV. 719, 775 (2009); Oskar Liivak, Rescuing the Invention from the Cult of the Claim 6 (Feb. 24, 2011) (unpublished manuscript), *available at* http://ssrn.com/abstract=1769270.

42 620 F.3d 1305 (Fed. Cir. 2010).

43 *Id.* at 1308-09.

44 *Id.* at 1311.

cept of spinal implants, nor was he the first to use a single anchor in a spinal device.[45] Applying apportionment, the invention to be valued is the combination. Any value attributable to the invention of the spinal implant or the single anchor—both of which predate the patent—should be subtracted from the value of the full claim scope.

As another example, the claim at issue in *i4i Ltd. Partnership v. Microsoft Corp.*[46] was an improved method for editing documents that contain text and markup languages.[47] The background of this art included markup language characters inserted around text as tags to tell a computer how the text should be displayed, such as in bold or italics.[48] The *i4i* patentee invented neither markup languages nor markup language editors; rather, the patentee improved prior art editors by implementing a solution to store the document's content and tags separately.[49] Notably, the preamble of an independent claim included the background art, including "[a] computer system for the manipulation of the architecture and content of a document having a plurality of metacodes and content," together with a series of steps that described the use of tags coupled with a menu and map.[50] In this instance, the *i4i* reasonable royalty must not be based on the value of the entire computer system that is included in the preamble. The value of the prior art, such as the pre-existing practice of using of software tags and mapping, should be excluded. In the final analysis, compensation should be granted for the use of the separate storage of the text and tag—that is, the point of novelty added to the art by the inventor of the patent in suit.

In some cases, the scope of the infringed claim and its advance may be impossible to apportion. Simply because claims are based on pre-existing information does not mean that even the finest logic can credibly unravel their separate inputs. Such claims may be common in the current pharmaceutical industry, for example those inventions that represent a nuanced but essential difference in molecular structure.[51] If a patentee demonstrates that circumstance, the claim must be valued as a whole.

This does not suggest that any art can be fully excluded from meaningful evaluation of the patentee's contribution. For example, some pharmaceutical claims may be based on a modest change to an existing formula-

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45 *Id.*

46 598 F.3d 831 (Fed. Cir. 2010), *aff'd*, 131 S. Ct. 2238 (2011).

47 *Id.* at 839-40 (describing the invention); U.S. Patent No. 5,787,449, col. 1 ll. 9-13, 49-55 (filed June 2, 1994).

48 *i4i*, 598 F.3d at 839-40.

49 *Id.* at 840.

50 U.S. Patent No. 5,787,449, col. 15 ll. 35-39 (filed June 2, 1994).

51 *See, e.g.*, David W. Opderdeck, *Patent Damages Reform and the Shape of Patent Law*, 89 B.U. L. REV. 127, 167 (2009) (describing how a particular compound that "represented a very modest difference from the prior art" was patentable because it had the potential to "lead to a commercial cancer treatment . . . . [or] the development of other medically useful and commercially successful chemical variants").

tion.[52] Such claims may be the valid subject of an apportionment analysis. Similarly, to the extent the direction of the pharmaceutical industry is toward multicomponent end products, apportionment may play an important role in ensuring appropriate compensation that does not obstruct the creation of future advances.

II. THEORIZING PATENTEE INJURY

A. *Claim Scope and Patentee Injury for Use of the Invention*

Today, the term "invention" is strongly associated with the entire claim scope.[53] As the widely invoked maxim states, "It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude."[54] Under the prevailing practice of peripheral claiming, the words of the claim define the outer boundary of the patentee's right.[55] That is, the use of claim terms set the "metes and bounds" of the patentee's right to exclude.[56] Implementations that fall within the claim's scope are deemed infringing.[57]

As a practical matter, claims frequently (and perhaps always) include information derived from pre-existing knowledge perhaps to meet one of

52 For an explanation of this practice, sometimes referred to as "evergreening," see EUROPEAN COMM'N, PHARMACEUTICAL SECTOR INQUIRY: FINAL REPORT 351 (2009), *available at* http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/staff_working_paper_part1.pdf ("[T]he launch of a second generation product can be a scenario in which an originator company might want to make use of instruments that delay the market entry of generic products corresponding to the first generation product. The companies have an incentive to do so in order to avoid, for the second generation product, exposure to competition stemming from generic versions of the first generation product.").

53 *See* Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 730-31 (2002) (stressing that the boundaries of the monopoly should be clear, and "[f]or this reason, the patent laws require inventors to describe their work in 'full, clear, concise, and exact terms'" (quoting 35 U.S.C. § 112 (2000))); Haemonetics Corp. v. Baxter Healthcare Corp., 607 F.3d 776, 783 (Fed. Cir. 2010) ("[T]he claims perform the fundamental function of delineating the scope of the invention . . . ."); Jeffrey A. Lefstin, *The Formal Structure of Patent Law and the Limits of Enablement*, 23 BERKELEY TECH. L.J. 1141, 1145 (2008) ("In modern parlance, the claim, 'the invention,' and 'the patent' are essentially synonymous.").

54 Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1115 (Fed. Cir. 2004)) (internal quotation marks omitted).

55 *See, e.g.*, Intervet Inc. v. Merial Ltd., 617 F.3d 1282, 1287 (Fed. Cir. 2010) (explaining that claim limitations "define the outer boundaries of claim scope"); Ariad Pharm., Inc. v. Eli Lilly & Co., 598 F.3d 1336, 1347 (Fed. Cir. 2010) (noting that a claim's "principle function . . . is to provide notice of the boundaries of the right to exclude and to define limits"); *Phillips*, 415 F.3d at 1323 (referring to the relationship between the specification and the outer boundary of the claims).

56 Kara Tech. Inc. v. Stamps.com Inc., 582 F.3d 1341, 1347-48 (Fed. Cir. 2009).

57 *In re* Vogel, 422 F.2d 438, 441-42 (C.C.P.A. 1970).

the requirements of patentability. As one example, a patentee's claim may include both the inventive contribution and its operational context in order to meet the utility requirement.[58] A frame of reference may be important to ensure that the contribution is sufficiently defined to meet the patentable subject matter requirement.[59] It is difficult to identify any claim that does not build on information that previously existed.

Current reasonable royalty calculation standards overlook any separation of the patentee's contributions from the technological context from which they arose. This may have led to the misperception that a reasonable royalty must match the claim scope. The patent system has never compelled this result.[60] Even during the system's earliest years, patentees were awarded monetary relief long before the law required that a patent include a claim.[61]

Several patent doctrines, such as the written description requirement, the definiteness requirement, and the doctrine of equivalents, treat invention as a separate concept from claim scope.[62] The written description require-

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58 *E.g.*, Research Corp. Techs., Inc. v. Microsoft Corp., 627 F.3d 859, 869 (Fed. Cir. 2010) (noting that a significant part of the advance was algorithms and formulas, as well as a "high contrast film," "a film printer," "a memory," and "printer and display devices" such that the claim was sufficiently concrete (internal quotation marks omitted)).

59 35 U.S.C. § 101 (2006); *see also* Bilski v. Kappos, 130 S. Ct. 3218, 3229-30 (2010) (holding that a certain concept for hedging financial risk "falls outside of § 101 because it claims an abstract idea" and is, therefore, not patentable).

60 *See infra* Part III.B.1.

61 *See* Karl B. Lutz, *Evolution of the Claims of U.S. Patents*, 20 J. PAT. OFF. SOC'Y 134, 135-37 (1938) (noting that the first patent using the word "claim" was in 1807 and that early claiming practices were "voluntary efforts" (first internal quotation marks omitted)); Joshua D. Sarnoff, *The Historic and Modern Doctrines of Equivalents and Claiming the Future, Part I (1790-1870)*, 87 J. PAT. & TRADEMARK OFF. SOC'Y 371, 382-84 (2005) ("Patent claims developed at a time when patent scope and patent protection were not determined by reference to or limited by claims."). At that time, the Patent Act required that the application disclose a description of the invention so as "to distinguish the invention or discovery *from other things before known and used*." Patent Act of 1790, ch. 7, § 2, 1 Stat. 109, 110 (1790) (emphasis added). These same principles were carried forward in subsequent versions of the statute until 1870. *See* Patent Act of 1793, ch. 11, § 3, 1 Stat. 318, 321 (1793) (requiring the submission of a written specification that described the invention "in such full, clear and exact terms, as to distinguish the same *from all other things before known*" (emphasis added)); Patent Act of 1836, ch. 357, § 6, 5 Stat. 117, 119 (1836) (requiring that the inventor disclose in the written description the "principle or character by which it may be *distinguished from other inventions*; and shall particularly specify and point out the part, improvement, or combination, which he claims as *his own invention or discovery*" (emphases added)).

62 *See, e.g.*, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 734 (2002) ("The doctrine of equivalents is premised on language's inability to capture the essence of innovation . . . ."); *In re* Katz Interactive Call Processing Patent Litig., 639 F.3d 1303, 1319 (Fed. Cir. 2011) (observing that the "scope of the right to exclude, as set forth in the claims," may be distinct from "the scope of the inventor's contribution to the field of art as described in the patent specification" in assessing compliance with 35 U.S.C. § 112's written description requirement); SmithKline Beecham Corp. v. Apotex Corp., 403 F.3d 1331, 1340-41 (Fed. Cir. 2005) ("The test for indefiniteness does not depend on a potential infringer's ability to ascertain the nature of its own accused product to determine infringe-

ment requires courts to examine the relationship between the invention and the claim.[63] By searching for a correspondence between them, this test implies that the inventor's solution and the claim scope are separate concepts.[64] As Professor Oskar Liivak points out, the opposite conclusion would render the written description and claim requirements redundant.[65]

The definiteness requirement examines whether the claim adequately conveys "the subject matter which the applicant regards as his invention."[66] The doctrine, which considers whether the inventor has adequately articulated the invention, signifies that claiming is a matter of form to create boundaries that include the inventor's work.[67] Alternatively, a claim that fails to provide sufficiently definite text for purposes of providing notice will not be recognized as an "invention" under the law.[68] As with the written description requirement, definiteness highlights that a real-world invention is separate from the language of the corresponding claim.

The doctrine of equivalents finds infringement where the implementation incorporates "the benefit of an invention,"[69] suggesting that the invention is something that exists beyond the literal words of the claim. As the Supreme Court has recognized, the invention and the words describing it are not coterminous, and "the nature of language makes it impossible to capture the essence of a thing in a patent application."[70] The Court has further emphasized that "[a]n invention exists most importantly as a tangible structure or a series of drawings"—that is, the inventor's solution is later ensconced in a claim that is "usually an afterthought written to satisfy the requirements of patent law."[71] Such language implicitly acknowledges that

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ment, but instead on whether the claim delineates to a skilled artisan the bounds of the invention."); Reiffin v. Microsoft Corp., 214 F.3d 1342, 1345-46 (Fed. Cir. 2000) ("[T]he written description requirement encompasses an 'omitted element test' which 'prevents a patent owner from asserting claims that omit elements that were essential to the invention as originally disclosed.'" (emphasis omitted) (quoting Reiffin v. Microsoft Corp., 48 U.S.P.Q.2d 1274, 1278 (N.D. Cal. 1998), *rev'd*, 214 F.3d 1342 (Fed. Cir. 2000))).

63 *See* Ariad Pharm., Inc. v. Eli Lilly & Co., 598 F.3d 1336, 1347 (Fed. Cir. 2010) (en banc) (recognizing that claims define the "boundaries of the right to exclude" and do not "describe the invention"); *In re* Gosteli, 872 F.2d 1008, 1012 (Fed. Cir. 1989) (considering the distinction between that which was invented and that which was claimed).

64 *See* Agilent Techs., Inc. v. Affymetrix, Inc., 567 F.3d 1366, 1379 (Fed. Cir. 2009); Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991).

65 *See* Liivak, *supra* note 41 (manuscript at 7-8).

66 35 U.S.C. § 112 (2006).

67 *Cf.* Star Scientific, Inc. v. R.J. Reynolds Tobacco Co., 537 F.3d 1357, 1371 (Fed. Cir. 2008) (describing the standard).

68 *See* Research Corp. Techs., Inc. v. Microsoft Corp., 627 F.3d 859, 869 (Fed. Cir. 2010).

69 Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 608 (1950) (quoting Royal Typewriter Co. v. Remington Rand, Inc., 168 F.2d 691, 692 (2d Cir. 1948)) (internal quotation marks omitted).

70 Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 731 (2002).

71 *Id.* (quoting Autogiro Co. v. United States, 384 F.2d 391, 397 (Ct. Cl. 1967)).

peripheral claiming is a matter of form meant to capture an inventive result that sits apart from the words of a claim.

Peripheral claiming does not necessarily target, but must include, the inventive contribution.[72] It has been reported that the practice developed in response to interpretative practices that determined infringement based on the claim.[73] This development sought to increase certainty by providing a definitional focal point, rather than acting as a fundamental shift in the nature, scope, or strength of the patent right.[74] Monetizing the entire claim scope is not based on any reasoned decision or policy; rather, it is attributable to a lack of guiding principles under *Georgia-Pacific*.

Claims are not drafted to separately recognize exogenous contributions, but nearly all claims contain them. A further combinatorial event occurs when the claim is integrated into an infringing device or method. The infringer may have added improvements, together with undertaking commercialization expenses and risk in the product market. Conceptual boundaries between these separate inputs are rarely (if ever) acknowledged in the reasonable royalty analysis. Under these circumstances, a reasonable royalty cannot be expected to fully serve a compensatory function. Using the *Georgia-Pacific* factors, money will be awarded. However, there can be no assurance that the recovery corresponds to the nature of the violated right.

B. *Injury for Use of the Invention*

Patent infringement is considered a tort.[75] For the vast majority of civil remedies, cause is an element of a claim for damages to ensure that the compensation awarded is roughly commensurate to the harm suffered from the wrongful conduct.[76] Although patent cases occasionally refer to the doctrine of proximate cause,[77] a theoretical foundation of a causal connection

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[72] *See* Lefstin, *supra* note 53, at 1167 (arguing that the United States has "consolidated three formerly separate concepts in patent law—the *invention*, the claim, and the scope of the inventor's exclusive rights—into a unitary conception founded upon the peripheral claim" (emphasis added)); *see also* 35 U.S.C. § 112 (2006) ("The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.").

[73] *See* Burk & Lemley, *supra* note 41, at 1746; Lefstin, *supra* note 53, at 1145; Lutz, *supra* note 61, at 154.

[74] *See* Lefstin, *supra* note 53, at 1143 ("Precise claiming provided clear notice of the patent's boundaries to the public, competitors, and other inventors.").

[75] Wordtech Sys., Inc. v. Integrated Networks Solutions, Inc., 609 F.3d 1308, 1313 (Fed. Cir. 2010).

[76] *See* H.L.A. HART & TONY HONORÉ, CAUSATION IN THE LAW 84 (2d ed. 1985) (describing that, as a general rule, causation establishes the existence and extent of liability).

[77] *See, e.g.*, Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538, 1546 (Fed. Cir. 1995) ("Judicial limitations on damages, either for certain classes of plaintiffs or for certain types of injuries have been imposed in terms of 'proximate cause' or 'foreseeability.'"); Kowalski v. Mommy Gina Tuna Res., 574 F.

between compensation and the patentee's injury appears to have been lost. Indeed, a theory of patentee injury does not appear to exist in the current case law at all.

Some foundational principles establish a starting point for patent infringement analysis. A reasonable royalty is a compensatory remedy.[78] There are two ways a patentee may be harmed by infringement. First, a patentee may suffer harm to a market that relates to the patented invention.[79] Although lost profits are thought to compensate for such harm, a reasonable royalty can substitute for, or augment, that form of relief.[80] In that instance, the patentee's market harm is compensable subject to the limits of proximate cause.[81] Proof of the loss supports recovery for harm to the patentee's market for sales of a patented product—for example, a patentee obtains a royalty based on competing sales even if the patentee cannot demonstrate lost profits.[82]

Second, a patentee can obtain a reasonable royalty for use of the invention in the absence of any pecuniary loss. A patent plaintiff need not show any market impairment or lost investment revenue.[83] Patent law presumes that infringement leads to, at a minimum, an injury from the invention's use as the violation of the patent right.[84] This is true for both patentees who have built a business around patented technology and those who have no intent to exploit the patent or operate in any market.[85] One might

Supp. 2d 1160, 1163 (D. Haw. 2008) ("[T]he key question is whether the profits from the subsidiary flowed 'inexorably' to the parent.").

78 35 U.S.C. § 284 (2006); *see* Aro Mfg. Co. v. Convertible Top Replacement Co., 377 U.S. 476, 507 (1964) (the statutory measure of damages is "the difference between [the patent owner's] pecuniary condition after the infringement, and what his condition would have been if the infringement had not occurred" (quoting Yale Lock Mfg. Co. v. Sargent, 117 U.S. 536, 552 (1886)) (internal quotation marks omitted)).

79 *See* Del Mar Avionics, Inc. v. Quinton Instrument Co., 836 F.2d 1320, 1326 (Fed. Cir. 1987) ("The general rule for determining the actual damages to a patentee that is itself producing the patented item, is to determine the sales and profits lost to the patentee because of the infringement.").

80 *See* Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655, 655-56 (2009) (describing reasonable royalties as a "floor or backstop for those who cannot prove that they have lost profits as a result of infringement").

81 *See id.* at 670 & n.70.

82 *Rite-Hite Corp.*, 56 F.3d at 1554.

83 John E. Dubiansky, *An Analysis for the Valuation of Venture Capital-Funded Startup Firm Patents*, 12 B.U. J. SCI. & TECH. L. 170, 177 (2006).

84 *See* Stephen Perry, *Harm, History, and Counterfactuals*, 40 SAN DIEGO L. REV. 1283, 1292 (2003) (distinguishing the common concept of "harm" from a legal injury, which is the violation of a right).

85 *See* Del Mar Avionics, Inc. v. Quinton Instrument Co., 836 F.2d 1320, 1328 (Fed. Cir. 1987) ("The principle underlying damage measurement is unchanged even when there is an established royalty, for it is reasonable to assume that this royalty is a fair measure of the actual damage to a patentee who has authorized others to practice the patented invention."); *see also* Dubiansky, *supra* note 83, at 177 (describing reasonable royalties in the licensing context, where "the patent owner is not engaged in an enterprise which utilizes the patent").

assume that a patentee who commercializes a product suffers both types of harm and is more likely to obtain higher awards from the cumulative impact of both. Yet one recent study found that juries tend to award higher amounts to nonpracticing entities.[86] Although the reason for this circumstance has not been determined, it may be an additional indicator that the compensatory purpose of the patent damages has been lost.

Apportionment does not affect these basic compensatory principles of patent law, and it takes as a given the patent system's present standing requirements.[87] Instead, apportionment sets the starting point for determining the patentee's injury by imposing a gating inquiry prior to valuation. As a general rule, damages should equal the harm caused by the injurer.[88] Apportionment is based on the premise that the patentee cannot be injured for use of implementations that the patentee did not invent.[89] Based on this theory, apportionment aligns the patentee's contribution with the measure of the reasonable royalty.

Outside patent law, many causes of action have an identifiable, and sometimes visible, injury. Different components of harm—lost wages, cover for a breached contract, pain and suffering—require causative proof to the event giving rise to the claim.[90] By comparison, to date, the application of the *Georgia-Pacific* factors has not required that the patentee demonstrate cause in fact to an injury.[91] Beyond that point, patentee injury has remained virtually unexamined.

Defining any type of injury has presented challenges for theorists considering the nature of private relief. Some have drawn a distinction between suffering harms and being wronged, the latter leading to a legally recogniz-

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[86] PRICEWATERHOUSECOOPERS, *supra* note 2, at 7 (finding that damage awards for nonpracticing entities are triple the amount for practicing entities).

[87] *Cf.* Christina Bohannan & Herbert Hovenkamp, *IP and Antitrust: Reformation and Harm*, 51 B.C. L. REV. 905, 915, 989 (2010) (noting the absence of an "IP injury" doctrine to effectuate invention and innovation in the manner similar to the doctrine of the injury requirement of antitrust law). Unlike apportionment, Professors Bohannan and Hovenkamp propose that patentee injury "requires compensation only where the defendant's use harms the IP holder's ex ante incentives to innovate." *Id.* at 987; *see also* Roger D. Blair & Thomas F. Cotter, *Rethinking Patent Damages*, 10 TEX. INTELL. PROP. L.J. 1, 74 (2001) (discussing a patent injury requirement for lost profits claims).

[88] A. Mitchell Polinsky & Steven Shavell, *Punitive Damages: An Economic Analysis*, 111 HARV. L. REV. 869, 878 (1998) ("[T]he proper magnitude of damages is equal to the harm . . . caused.").

[89] *Cf.* Seymour v. McCormick, 57 U.S. (16 How.) 480, 482 (1854) ("[W]e deny that the patent laws confer a monopoly of profits on any thing not actually patented.").

[90] *See, e.g.*, Sindell v. Abbott Labs., 607 P.2d 924, 928 (Cal. 1980) ("[A]s a general rule, the imposition of liability depends upon a showing by the plaintiff that his or her injuries were caused by the act of the defendant . . . .").

[91] *See, e.g.*, Gargoyles, Inc. v. United States, 113 F.3d 1572, 1580, 1582 (Fed. Cir. 1997) (affirming an award of a reasonable royalty where the patentee failed to prove lost profits); Rosco, Inc. v. Mirror Lite Co., 626 F. Supp. 2d 319, 328 (E.D.N.Y. 2009) (holding that the patentee was entitled to a reasonable royalty where patentee could not prove causation between the infringement and his lost profits).

able injury.[92] The difference between the two rests on the application of law.[93] The former is a real-world impact, encompassing effects of conduct that is not wrongful.[94] The latter is compensable due to the operation of law.[95] In the patent context, one who designs around a claim harms the inventor who pioneers a new market based on a novel invention.[96] Yet such harm is not considered an injury because the law provides that compensation is not due in the absence of infringement.[97] As an additional distinction, injuries must fall within the scope of the interest protected by law.[98]

Certainly, intellectual property has attributes that complicate direct analogies to other areas of law.[99] Yet Professor Arthur Ripstein, who discusses theories of injury for tort law, provides a helpful insight that can serve as a source of analogy to formulate a theory of patentee injury.[100] He argues that compensable injuries are entitlements that provide one with the means to accomplish one's intention.[101] Under his analysis, private law protects against interferences with a plaintiff's right to decide how one's person or property should be used when harm is rendered to "a field that you wish to leave fallow, or a piece of jewelry that you leave in a locked cabinet in your basement."[102] Viewing private law through this lens, Ripstein takes a broad view of injury, arguing that a court should award compensation for the unauthorized use of anything that belongs to the plaintiff and that might

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92 John C.P. Goldberg, *Rethinking Injury and Proximate Cause*, 40 SAN DIEGO L. REV. 1315, 1323 (2003); Arthur Ripstein, *As If It Had Never Happened*, 48 WM. & MARY L. REV. 1957, 1960 (2007).

93 *See generally* Louis Kaplow & Steven Shavell, *Fairness Versus Welfare*, 114 HARV. L. REV. 961, 1084-87 (2001) (discussing the normative aspects of labeling a harm as an injury).

94 Perry, *supra* note 84, at 1292.

95 *Id.*

96 *See* Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 535 U.S. 722, 731-32 (2002) ("If patents were always interpreted by their literal terms, their value would be greatly diminished. Unimportant and insubstantial substitutes for certain elements could defeat the patent, and its value to inventors could be destroyed by simple acts of copying.").

97 *See* Minn. Mining & Mfg. Co. v. Chemque, Inc., 303 F.3d 1294, 1304-05 (Fed. Cir. 2002) (holding that a patentee claiming damages for inducement to infringe a patent must first show that that there has been a direct infringement).

98 *See* 35 U.S.C. § 284 (2006); John C.P. Goldberg & Benjamin C. Zipursky, *Unrealized Torts*, 88 VA. L. REV. 1625, 1693 (2002) (noting that a tort "involves interference with a particular kind of liberty interest"); John C. Jeffries, Jr., *Damages for Constitutional Violations: The Relation of Risk to Injury in Constitutional Torts*, 75 VA. L. REV. 1461, 1469-70 (1989) (observing that not all injuries are compensable, but only those linked to the system that justifies compensation).

99 *See generally* Peter S. Menell, Governance of Intellectual Resources and Disintegration of Intellectual Property in the Digital Age 7-12 (UC Berkeley Public Law Research Paper No. 1615193), *available at* http://ssrn.com/abstract=1615193 (providing a comprehensive account of the differences between interference with tangible and intellectual property).

100 Ripstein, *supra* note 92, at 1958-61.

101 *Id.* at 1966-67.

102 *Id.* at 1967.

be used to accomplish the patentee's aims.[103] At first blush, this theory might counsel in favor of awarding damages on the entire claim scope, as the patentee's right to exclude extends to that degree. A closer examination of Ripstein's analysis demonstrates that this conclusion is indefensible.

Specifically, he acknowledges that "[n]ot everything that a person benefits from, or uses to his advantage, counts as his means in the relevant sense."[104] He observes that, where a plaintiff's customers use a bridge owned by a third party and that bridge is destroyed, the plaintiff is denied recovery for losses traceable to the destruction of the bridge.[105] Recognizing that compensation is not warranted for harm to property over which the plaintiff does not exercise legal control, he explains that "[s]uch examples illustrate the sense in which someone can use something without it being at that person's disposal."[106]

This perception illuminates a principle useful for patent law—that is, nearly all claims incorporate noninventive material from the prior art or third parties. Whether expressly or implicitly, this does not create inventorship, ownership, or legal control of these exogenous contributions. This can be seen very clearly if we assume that a claim includes the inventor's contribution *A* together with a third party's patented invention *B*. Although the inventor can name *B* in claim *A*, the inventor does not own *B*. Under patent standing rules, he cannot assert *B* against others; only the third party can. Furthermore, the inventor cannot practice the claim without a license to *B*. In short, the inventor is able to include *B* in the text of the peripherally stated claim to the combination of *A* and *B* but cannot assert to have invented *B*. Just as the general rules of tort recovery prevent a plaintiff from recovering for harm to another's person or property, a patentee cannot claim an injury to something he did not invent. A contrary holding creates a causal disconnect. As one torts scholar explains, a defendant "must pay to the plaintiff not just any amount, but precisely the amount of the plaintiff's injury."[107]

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103 *See id.* at 1961-62.

104 *Id.* at 1977.

105 *Id.*

106 Ripstein, *supra* note 92, at 1977. Ripstein cites other examples where no entitlement or control exists, such as an employer that is harmed when an employee is injured by a third party and adjacent landowners who are harmed by a lack of the ability to control activities of the other. *Id.* at 1977-80. Other parallels include secondary exposure cases and limitations on recovery for injuries to a third party, absent a legally recognized connection or the creation of a derivative cause of action. *See, e.g.*, Anderson v. Eli Lilly & Co., 588 N.E.2d 66, 67-68 (N.Y. 1991) (holding that a husband cannot recover for loss of wife's consortium where injury caused by defendant predated husband and wife's marriage); Fiorenzano v. Lima, 982 A.2d 585, 591 (R.I. 2009) (holding that plaintiff cannot maintain an action for the loss of his wife's consortium since plaintiff's claim is a derivative cause of action and plaintiff's wife was not a party to the action).

107 Benjamin C. Zipursky, *Civil Recourse, Not Corrective Justice*, 91 GEO. L.J. 695, 701 (2003).

An alternative framework opens another line of inquiry—whether increasing the compensatory figure justifies an award more than a compensatory amount. Drawing on the work of theorist Stephen Perry, one might view harms as falling into either a first or second order.[108] His account identifies first-order harms as core, such as the protection against bodily harm.[109] Second-order interests are legally cognizable only where another interest is being served.[110] Applying this outline to the problem at hand, one might consider infringement of the inventor's contribution a first-order harm. Compensation for the invention developed by another is, if anything, a secondary harm that cannot support compensation unless a valid justification exists.

One potential rationale draws from a developing literature that considers monetary evaluation in light of patent law's incentive scheme.[111] Yet this literature does not appear to advocate a theory of patentee compensation for more than the inventor actually created.[112] Further, creating a damages scheme based on the entire claim scope may provide incentives for broad claiming rather than invention. There may be reasons to adjust the valuation inquiry based on the incentive theory, but distorting the identification of the inventive aspect of the claim seems an unwieldy and disconnected way to reach that end.

Another justification for awarding more than a patentee's injury may be to meet other goals, such as deterrence. As Professor Richard Epstein describes, an ideal property-based patent system incorporates remedies that include "an additional deterrent against future infringement."[113] Then, a correct measure of damages may be viewed as a matter of optimal deterrence—that is, damages that are intended to create appropriate incentives for actors to undertake socially beneficial conduct.[114] As a general rule, the optimal level of deterrence for civil remedies is payment equal to the harm caused by the defendant's tortious activity.[115] As Professors A. Mitchell

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108 Perry, *supra* note 84, at 1306-07.

109 *Id.* at 1307.

110 *Id.* at 1308; *see also* Goldberg, *supra* note 92, at 1325-26 (describing interference with second order interests as compensable when doing so serves pragmatic or utilitarian ends).

111 *E.g.*, Einer Elhauge, *Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?*, 4 J. COMPETITION L. & ECON. 535 (2008); Golden, *supra* note 1, at 530-31 (considering the impact of patent value on research incentives, among other incentives).

112 *Cf.* Elhauge, *supra* note 111, at 541-42 (discussing incentives to invent); Golden, *supra* note 1, at 530-31 (same).

113 Richard A. Epstein, *The Disintegration of Intellectual Property? A Classical Liberal Response to a Premature Obituary*, 62 STAN. L. REV. 455, 484 (2010).

114 *See generally* Polinsky & Shavell, *supra* note 88, at 879-91 (discussing optimal deterrence for liability in tort law). As applied to law, optimal deterrence theory holds that a rational actor will weigh the magnitude of the penalty and the probability of being detected against the gain from the violation. *See, e.g.*, Maurice E. Stucke, *Morality and Antitrust*, 2006 COLUM. BUS. L. REV. 443, 448 (2006) (discussing optimal deterrence theory).

115 Polinsky & Shavell, *supra* note 88, at 878.

Polinsky and Steven Shavell point out, "If damages are either lower or higher than the harm, various socially undesirable consequences will result."[116] In the torts context, requiring a defendant to pay for precisely the harm caused ensures that the precautions taken are neither excessive nor inadequate.[117] As an example from negligence law, the correct measure of damages ensures that a defendant undertakes conduct that generates the optimal level of risk.[118]

The primary vehicle for implementing optimal deterrence in tort is punitive damages.[119] Among other reasons, imposing a punitive judgment is appropriate to deter conduct to prevent underenforcement, such as where the fact of the wrongdoing, or the wrongdoer, is difficult to detect.[120] In addition to examining the defendant's state of mind, punitive damages are viewed as a mechanism to remove the defendant's incentive to continue the tortious conduct by forcing the wrongdoer to internalize the cost of the wrongful behavior.[121] Extra-compensatory damages may be appropriate when the defendant's conduct is subject to underenforcement.

Viewed in this framework, awarding extra compensatory damages is not an appropriate default rule in patent cases in the absence of willful infringement.[122] As a general rule, patent infringement is akin to a strict liability offense.[123] Liability may be imposed for innocent conduct where the invention has been independently developed by another. Copying may be rare, particularly outside the pharmaceutical field.[124] Building deterrence goals into every liability finding is theoretically inconsistent with the in-

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116 *Id.*

117 *See id.* at 881-83.

118 *Id.* at 882-83.

119 Cass R. Sunstein et al., *Assessing Punitive Damages (with Notes on Cognition and Valuation in Law)*, 107 YALE L.J. 2071, 2075 (1998) (discussing the purpose of punitive damages as "penalizing defendants enough ex post that they will undertake optimal precautions ex ante").

120 *Id. But see* Alex Stein, *The Flawed Probabilistic Foundation of Law and Economics*, 105 NW. U. L. REV. 199, 226-30 (2011) (criticizing the law and economics theory that favors increased penalties as a necessary remedy for underenforcement).

121 *See* Dan Markel, *Retributive Damages: A Theory of Punitive Damages as Intermediate Sanction*, 94 CORNELL L. REV. 239, 242 (2009).

122 *See generally* Brian J. Love, *The Misuse of Reasonable Royalty Damages as a Patent Infringement Deterrent*, 74 MO. L. REV. 909, 923-34 (2009) (providing a comprehensive analysis of this issue); Polinsky & Shavell, *supra* note 88, at 878-87 (discussing how compensatory damages in tort law should equal the plaintiff's harm and deterrence should be accomplished using punitive damages).

123 *In re* Seagate Tech., LLC, 497 F.3d 1360, 1368 (Fed. Cir. 2007).

124 Christopher A. Cotropia & Mark A. Lemley, *Copying in Patent Law*, 87 N.C. L. REV. 1421, 1424 (2009) (concluding that copying is established in less than 2 percent of all cases and alleged in only 10.9 percent; and noting that more than half of these were outside the pharmaceutical sector). Professors Cotropia and Lemley suggest that deterrence or unjust enrichment principles in the patent damages calculus may be misguided. *Id.* at 1462. The patent system authorizes treble damages against copyists to deter such activity. 35 U.S.C. § 284 (2006).

fringement standard that imposes liability on innocent conduct.[125] A remedy has been created to compensate for ideas appropriated by another. That is, copyists are subject to the threat of treble damages through the doctrine of willfulness.[126]

Beyond this, there is little reason to suppose that awarding a reasonable royalty based on the full claim scope approximates the appropriate level of optimal deterrence. Claim scope and deterrence are not logically connected. Patent prosecutors draft claims of varying scope to maximize the patentee's interest in achieving broad protection while preserving the patentee's right if the broadest claims are found invalid.[127] Litigation attorneys have an incentive to assert the narrowest valid claim against infringers to minimize the number of elements that must be proven to demonstrate infringement.[128] Neither of these concerns even remotely meshes with optimal deterrence theory, which emphasizes the need for the infringer to internalize costs on an individualized basis.[129] Deterrence does not warrant categorically awarding a reasonable royalty for the full claim scope to all patentees. The peripheral boundaries of the claim are an illogical place to fix any perceived inadequacies of the patent damage calculation. Rather, such concerns can be addressed in the valuation stage.

III. THE CURRENT PATENT ACT REQUIRES APPORTIONMENT

According to one critic of apportionment, isolating the inventive contribution is a change that will interfere with patent valuation under the *Georgia-Pacific* factors, which is said to provide "well-established (and arguably incontrovertible) legal and economic principles" that adequately

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125 Joseph H. King, Jr., *A Goals-Oriented Approach to Strict Tort Liability for Abnormally Dangerous Activities*, 48 BAYLOR L. REV. 341, 353-54 (1996) ("On one hand, strict liability may be imposed on a defendant even if that defendant is innocent. Yet, the very existence of loss avoidance goals by definition assumes that some aspect of the defendant's activity could have been changed for the better." (footnote omitted)).

126 35 U.S.C. § 284; SRI Int'l, Inc. v. Advanced Tech. Labs., Inc., 127 F.3d 1462, 1464 (Fed. Cir. 1997) (recognizing that "enhanced damages are not compensatory but punitive").

127 *See* Pavan K. Agarwal, *Patenting in Line with the Federal Circuit*, 12 FED. CIR. B.J. 395, 419-20 (2002-2003) (noting that patent drafters must consider how broadly to draft the scope of the patent); Matthew Eggerding, Comment, *Dependent Patent Claims and Prosecution History Estoppel: Weakening the Doctrine of Equivalents*, 50 ST. LOUIS U. L.J. 257, 275 (2005) ("To avoid the use of the doctrine of equivalents and decrease the possibility of estoppel, applicants should draft claims with an eye toward literal infringement.").

128 *Cf.* Patricia E. Campbell, *Representative Patent Claims: Their Use in Appeals to the Board and in Infringement Litigation*, 23 SANTA CLARA COMPUTER & HIGH TECH. L.J. 55, 84-85 (2006) (arguing that, if a plaintiff patentee is limited to a few claims, he should assert the narrowest claims possible where infringement can likely be proven without raising doubt about the validity of the patents).

129 *See* Polinsky & Shavell, *supra* note 88, at 887-90 (discussing the need for punitive damages to ensure optimal deterrence when there is a low rate of detection).

determine the market value of the patented invention and, in turn, appropriate compensation.[130] This assertion is both historically and factually inaccurate. A close examination of the history of the current patent damages statute, Section 284 of the Patent Act, demonstrates that the meaning of the phrase "a reasonable royalty for the use made of the invention" means an award for the inventor's contribution over the prior art.[131] This is evident from a review of the statute's history and within the context of the cases decided during the time of its enactment.[132]

At the U.S. patent system's inception, no reasonable royalty existed. Rather, this form of relief arose primarily in the courts of equity to provide for compensation as an adjunct to injunctive relief.[133] Monetary relief in equitable actions was originally founded on the theory that the infringer's profits were held in a constructive trust on behalf of the patentee.[134] Over the years, the concept of a trust was replaced with the view that monetary awards in equity were compensatory in nature and efficient methods to grant patentees awards without resorting to a separate action in the courts of law.[135] As this compensatory purpose became established, a reasonable royalty emerged as a method of compensating patentees who could not satisfy the requirements of the entire market value rule to establish an entitlement to all of the defendant's profits.[136] Essentially, the reasonable royalty was created as a form of general damages for the violation of the patentee's exclusive right to use the invention, akin to an award for a trespass to property or pain and suffering in a tort action.[137] Permitting patentees to rely on general evidence of damages allowed patentee's recovery for use of what had been taken after the patentee's contribution was indentified.[138]

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130 *Hearing*, *supra* note 3, at 110-11 (statement of Bernard J. Cassidy, Senior Vice President & Gen. Counsel, Tessera, Inc.).

131 35 U.S.C. § 284; Amy L. Landers, Theorizing "Patentee Injury": Apportioning Claims for Reasonable Royalty Compensation 29 (Feb. 1, 2011) (unpublished manuscript), *available at* http://www.law.stanford.edu/display/images/dynamic/events_media/Amy%20L.%20Landers%20-%20Theorizing%20Patentee%20Injury.pdf; *see also* Vincent P. Tassinari, 31 UWLA L. REV. 45, 64 (2000) (providing the legislative history of Section 284 of the Patent Act).

132 *See generally* Eric E. Bensen, *Apportionment of Lost Profits in Contemporary Damages Cases*, 10 VA. J.L. & TECH. 8, ¶¶ 46-68 (2005), *available at* http://www.vjolt.net/vol10/issue3/v10i3_a8-Bensen.pdf.

133 *Id.* ¶¶ 48-49 (discussing the development of damages awards in conjunction with injunctive relief in courts of equity).

134 Packet Co. v. Sickles, 86 U.S. (19 Wall.) 611, 617 (1874) ("The rule in suits in equity . . . . is that of converting the infringer into a trustee for the patentee as regards the profits thus made . . . .").

135 Bensen, *supra* note 132, ¶ 49.

136 *Id.* ¶ 51.

137 *See* U.S. Frumentum Co. v. Lauhoff, 216 F. 610, 615-17 (6th Cir. 1914) (comparing infringement to torts and property to determine general damages from the violation).

138 *See* Dowagiac Mfg. Co. v. Minn. Moline Plow Co., 235 U.S. 641, 648 (1915).

This recognition vaguely persists in today's reasonable royalty, though it appears to have been lost within the multi-factor *Georgia-Pacific* test, which "overloads the jury with factors to consider that may be irrelevant, overlapping, or even contradictory."[139] *Georgia-Pacific*'s failure to properly isolate the patentee's contribution is inconsistent with the statutory authority for that form of relief, "a reasonable royalty for the use made of the invention by the infringer."[140]

There are two statutory terms that warrant particular examination. First, the word "invention" was added to the patent damages statute at a time the term referred to the ability to separate a claim from the prior art to examine whether a claim is obvious.[141] Second, the term "reasonable royalty" was added to the statute at a time the courts examined the patentee's contribution to the prior art.[142] Together, the phrase "reasonable royalty for the use made of the invention" in the current version of the Patent Act integrates apportionment concepts.

These terms derive from case law that existed at the time of their addition to the statute. As Professor Peter Menell writes, "[i]n applying intellectual property law, courts should trace the origin of statutory text or doctrine in order to determine the proper judicial lens—whether to use a common law approach or to focus narrowly on statutory text."[143] The reasonable royalty was developed by the courts at a time when the judiciary was "filling in statutory gaps, integrating constitutional, antitrust, and pragmatic limitations, and drawing upon tort and equity principles to effectuate the enforcement of rights."[144] By creating this new form of compensatory relief, courts evidenced cognizance that the patentee's contribution was not controlled by the claims but rather by the contribution over the prior art.[145] As

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139 Durie & Lemley, *supra* note 1, at 628.

140 35 U.S.C. § 284 (2006).

141 Giles S. Rich, *The Vague Concept of "Invention" as Replaced by § 103 of the 1952 Patent Act*, 14 FED. CIR. B.J. 147, 157 (2004-2005); *see supra* notes 131-32 and accompanying text.

142 Eric E. Bensen & Danielle M. White, *Using Apportionment to Rein in the* Georgia-Pacific *Factors*, 9 COLUM. SCI. & TECH. L. REV. 1, 26-27 (2008).

143 Peter S. Menell, The Mixed Heritage of Federal Intellectual Property Law and Ramifications for Statutory Interpretation, *in* INTELLECTUAL PROPERTY AND THE COMMON LAW (Shyam Balganesh ed., forthcoming 2012) (manuscript at 28), *available at* http://ssrn.com/abstract=1895784; *see also* Craig Allen Nard, *Legal Forms and the Common Law of Patents*, 90 B.U. L. REV. 51, 72-73 (2010) (explaining how many of the statutes simply codified common law principles that had been in practice for years). One prominent example is the judicially created nonobviousness requirement. *See, e.g.*, Hotchkiss v. Greenwood, 52 U.S. (11 How.) 248, 266-67 (1851). This doctrine was ultimately incorporated into the 1952 Patent Act at 35 U.S.C. § 103. Graham v. John Deere Co., 383 U.S. 1, 3-4 (1966) ("[T]he 1952 Act was intended to codify judicial precedents embracing the principle long ago announced by this Court in *Hotchkiss v. Greenwood* . . . ."). Other examples include patent claiming and reissue. Nard, *supra*, at 66-68.

144 Menell, *supra* note 143 (manuscript at 12).

145 *See, e.g.*, Horvath v. McCord Radiator & Mfg. Co, 100 F.2d 326, 331 (6th Cir. 1938); Egry Register Co. v. Standard Register Co., 23 F.2d 438, 440 (6th Cir. 1928).

originally envisioned, the reasonable royalty inquiry was preceded by an identification of the patentee's actual contribution to the subject art.[146] Identifying the patentee's contribution as the critical gating question to the admission and consideration of valuation evidence is consistent with sound policy—that is, one must first identify what a patentee has contributed before determining its value. The *Georgia-Pacific* test fails to provide this framework. Rather, the test resembles a parts list—a starting point of considerations that provide the types of questions that may illuminate the value of an invention but fails to instruct how those factors must be applied to accomplish the statute's purpose.[147] As currently implemented, *Georgia-Pacific* does not provide any incontrovertible valuation principles.

A. *"Use of the Invention"*

An examination of the historical background to Section 284 illuminates the meaning of the text. At the time "invention" was added to the patent damages statute in 1946, the term referred to that which was not obvious to a person of ordinary skill in the art.[148] This requirement took hold after the landmark 1850 *Hotchkiss v. Greenwood*[149] decision, the first Supreme Court opinion to find a patent "destitute of ingenuity or invention" and barred claims that required only the ingenuity or skill "possessed by an ordinary mechanic acquainted with the business."[150] This "invention requirement" was renamed in 1952 after a long period of inconsistent application that led to uncertainty and an overall weakening of the patent right.[151] As one jurist described, during this era the term "invention" had become "the plaything of the judiciary and many judges delighted in devising and expounding their own ideas of what it meant," suffering from "periods of too much leniency and too much strictness, depending primarily . . . on what judges thought and the mood of country."[152] The term became particularly unworkable after the Supreme Court's 1946 *Cuno Engineering Corp.*

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146 *See* Bensen & White, *supra* note 142, at 24; *see infra* Part III.B.3.

147 *See* Ga.-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) ("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."), *judgment modified by* 446 F.2d 295 (2d Cir. 1971).

148 *See, e.g.*, Great Atl. & Pac. Tea Co. v. Supermarket Equip. Corp., 340 U.S. 147, 150-51 (1950) ("It is agreed that the key to patentability of a mechanical device that brings old factors into cooperation is presence or lack of invention."); Dow Chem. Co. v. Halliburton Oil Well Cementing Co., 324 U.S. 320, 327-28 (1945) (holding that the claimed process was a mere extension of existing knowledge and therefore "lack[ed] the very essence of an invention").

149 52 U.S. (11 How.) 248 (1851).

150 *Id.* at 266-67.

151 *See* Rich, *supra* note 141, at 157.

152 Giles S. Rich, *Laying the Ghost of the "Invention" Requirement*, 14 FED. CIR. B.J. 163, 167-68 (2004-2005).

v. Automatic Devices Corp.[153] decision, which required that a "new device, however useful it may be, must reveal the flash of creative genius not merely the skill of the calling."[154] In 1952, this trend was legislatively reversed by adding Section 103 to the Act, in which word "invention" was "in fact, carefully avoided with a view to making a fresh start, free of all the divergent court opinions about 'invention.'"[155] Eight years before the 1952 addition of the term "nonobviousness" to the Patent Act, the term "invention" was added to the remedies portion statute while "invention" was still widely understood to refer to that which was not obvious.[156] As detailed below, the historical background to the phrase "reasonable royalty" dovetails with this principle to encompass the apportionment requirement.

B. *The Historical Development of the Reasonable Royalty*

One commentator has suggested that apportionment would "transform patent rights into something far different, and far less valuable, than the nation's founders intended."[157] Another has expressed concern that narrowing the focus of the reasonable royalty is "designed to deprive patent owners of the true full economic value of their patents."[158] These statements misconstrue the nature of apportionment and suggest that tailoring reasonable royalty remedies to the patent's contribution is somehow inconsistent with historic patent jurisprudence. Yet a review of the patent system's history demonstrates that the opposite is true.

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[153] 314 U.S. 84 (1941).

[154] *Id.* at 91.

[155] Rich, *supra* note 141, at 157.

[156] 35 U.S.C. § 70 (1946) ("[T]he complainant shall be entitled to recover general damages which shall be due compensation for making, using or selling *the invention* . . . ." (emphasis added)). The term "obvious" was adopted in the 1952 amendment to Title 35 of the U.S. Code as a signal to the judiciary to avoid the subjectivity and vagueness that had plagued the invention requirement. Rich, *supra* note 141, at 157. As one of the authors of the 1952 amendments to the Patent Act described:

> The first policy decision underlying Section 103 was to cut loose altogether from the century-old term "invention." It really *was* a term impossible to define, so we knew that any effort to define it would come to naught. Moreover, it was felt that so long as the term continued in use, the courts would annex to it the accretion of past interpretations, a feeling history has shown to be well founded.

Rich, *supra* note 152, at 170. Other than eliminating *Cuno*'s controversial "flash of creative genius" standard, the 1952 amendment was not a substantive change in the law. *See* Graham v. John Deere Co., 383 U.S. 1, 15 (1966). The sole subsequent amendment to Section 284 was in 1952, which was "merely 'reorganization in language'" without an intent to change the 1946 statute's meaning. General Motors Corp. v. Devex Corp., 461 U.S. 648, 652 n.6 (1983) (quoting H.R. REP. NO. 82-1923, at 10, 29 (1952)).

[157] *See Hearing*, *supra* note 3, at 111 (statement of Bernard J. Cassidy, Senior Vice President & Gen. Counsel, Tessera, Inc.).

[158] *See Hearing*, *supra* note 3, at 80 (statement of Jack W. Lasersohn, Partner, Vertical Group).

The Patent Act has always permitted patentees to recover monetary relief for infringement.[159] The initial statutes provided for recovery at law.[160] In 1870, the Patent Act was amended to adopt the then-existing court practice of awarding monetary relief in equity.[161] Prior to the merger of law and equity in 1938, patentees elected between them.[162] During these years, the courts developed the reasonable royalty form of monetary recovery. In doing so, the courts implemented a form of apportionment that constrained the patentee's recovery to the inventive contribution over the prior art. These cases provide the relevant meaning of the phrase "reasonable royalty" used in the current version of the monetary relief provision of the Patent Act.

Another significant thread running throughout both law and equity cases relates to calculating damages for inventions that contributed to a portion of the value of the infringing device.[163] These cases were early iterations of the entire market value rule. Essentially, the opinions examined whether the patentee could recover the defendant's entire profits or, alternatively, only that portion which represented the patent's contribution to the infringing implementation. For example, in the 1853 case *Seymour v.*

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159 *See* Patent Act of 1922, ch. 58, § 8, 42 Stat. 389, 392 (1922) (providing for "profits to be accounted for by the defendant, the damages the complainant has sustained thereby," and where neither is calculable, the court may award "a reasonable sum as profits or general damages for the infringement"); Patent Act of 1897, ch. 391, § 6, 29 Stat. 692, 694 (1897) (amending Revised Statute 4921); Patent Act of 1870, ch. 230, § 55, 16 Stat. 198, 206 (1870) (specifying that a patentee is entitled to recover in actions at law and equity "in addition to the profits to be accounted for by the defendant, the damages the complainant has sustained thereby," which the court may increase in its discretion); Patent Act of 1836, ch. 357, § 14, 5 Stat. 117, 123 (1836) (providing that in a patent action, a court shall "render judgment for any sum above the amount found by such verdict as the actual damages sustained by the plaintiff, not exceeding three times the amount thereof, according to the circumstances of the case, with costs"); Patent Act of 1793, ch. 11, § 5, 1 Stat. 318, 322 (1793) (providing that an infringer must pay "a sum, that shall be at least equal to three times the price, for which the patentee has usually sold or licensed to other persons, the use of the said invention"); Patent Act of 1790, ch. 7, § 4, 1 Stat. 109, 111 (1790) (specifying that an infringer "shall forfeit and pay to the said patentee . . . such damages as shall be assessed by a jury").

160 *See* Patent Act of 1836 § 14; Patent Act of 1793 § 5; Patent Act of 1790 § 4.

161 Patent Act of 1870 § 55. During the first twenty years of the patent system, infringement actions were determined at law. Lutz, *supra* note 61, at 143. Over time, courts sitting in equity began deciding infringement actions. *Id.* Notably, courts sitting in equity awarded the patentee the infringer's profits well before the Act incorporated statutory authorization to do so. *See, e.g.*, Dean v. Mason, 61 U.S. (20 How.) 198, 204 (1858).

162 *See* Birdsall v. Coolidge, 93 U.S. 64, 68-69 (1876) (describing the former state of the law). A plaintiff might pursue both proceedings and elect to receive the larger of the two awards. *See* Gordon Form Lathe Co. v. Ford Motor Co., 133 F.2d 487, 490 (6th Cir.) (noting that a patentee was entitled to an election between the defendant's profits or damages), *aff'd*, 320 U.S. 714 (1943). According to the rules of equity, disgorgement was available only where infringement was ongoing. *See* Brown v. Lanyon, 148 F. 838, 842 (8th Cir. 1906).

163 Garretson v. Clark, 111 U.S. 120, 121 (1884) (action in equity); Seymour v. McCormick, 57 U.S. (16 How.) 480, 480 (1854) (action for damages at law).

McCormick,[164] the Court refused to allow damages on an entire infringing reaping machine where the invention at issue covered only an improvement to the seat.[165] Other cases reached the opposite conclusion,[166] applying a doctrine that has since developed into the today's entire market value rule.[167] Under this rule, an 1877 opinion held that damages should be based on the entire value of an improved sidewalk because the "entire profit" could be attributed to the use of the claim.[168]

Together, such cases illustrate early efforts to grant compensation to the patentee while refraining from charging an infringer for more than the patent's contribution to the final product.

1. Monetary Recovery in Equitable Actions

Prior to the merger of the two systems in 1938, a patentee seeking injunctive relief brought an action in equity rather than at law.[169] In equitable actions, monetary damages were considered merely incidental relief.[170] Particularly in the very early years of the United States, a patentee's monetary recovery in equity was limited to the infringer's profits.[171] Typically, determining the precise monetary award was accomplished by a court-ordered reference to a master, who directed the production and inspection of the infringer's financial records prior to the final calculation of the award.[172] When the system was first established, monetary relief in equitable actions

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164 57 U.S. (16 How.) 480 (1854).

165 *Id.* at 489 (finding that a claim to portion of a reaper could not support damages based on sales of the entire machine, and explaining that "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").

166 *See, e.g.*, Elizabeth v. Pavement Co., 97 U.S. 126, 141-42 (1878).

167 *See* Brian J. Love, Note, *Patentee Overcompensation and the Entire Market Value Rule*, 60 STAN. L. REV. 263, 269-71 (2007) (describing the modern entire market value rule).

168 *Elizabeth*, 97 U.S. at 141-42.

169 *Cf.* Bensen, *supra* note 132, ¶ 48 (noting that courts in equity proceedings could not award damages and courts in proceedings at law could not issue injunctions).

170 *See* Clark v. Wooster, 119 U.S. 322, 326 (1886) ("It is a general rule in patent causes, that established license fees are the best measure of damages that can be used. There may be damages beyond this . . . but these are more properly the subjects of allowance by the court, under the authority given to it to increase damages."); Agawam Co. v. Jordan, 74 U.S. (7 Wall.) 583, 593 (1869) (noting that a party could recover damages by an action on the case or instead bring the suit in equity and pray for an injunction to prevent the same violation from occurring).

171 *See, e.g.*, Root v. Ry. Co., 105 U.S. 189, 214 (1882) (reviewing cases and concluding "[i]t is true that it is declared in those cases that, in suits in equity . . . the patentee . . . is entitled to account of the profits realized by the infringer").

172 *See, e.g.*, Milwaukie & Minn. R.R. Co. v. Soutter, 69 U.S. (2 Wall.) 510, 521 (1865); Jones v. Morehead, 68 U.S. (1 Wall.) 155, 160 (1864); Corning v. Troy Iron & Nail Factory, 56 U.S. (15 How.) 451, 456 (1854).

was sharply limited in scope.[173] Doctrinally, these awards were viewed as disgorgement of the infringer's profits.[174] Thus, damage to the plaintiff was considered beyond the jurisdictional reach of the courts.[175] As one court explained, "We are aware of no rule which converts a court of equity into an instrument for the punishment of simple torts."[176] The underlying theory of these practices viewed a court awarding the patentee the defendant's profits as exercising its equity jurisdiction to convert the infringer into an involuntary trustee for the patentee who, upon a showing of infringement, obtained the right to an accounting of the infringer's profits that had been earned through the wrongdoing.[177] In the earliest years, such awards did not examine harm to the patentee; rather, a patentee who suffered no loss obtained the same measure of relief as those who did.[178]

This perspective began to shift near the time of the 1870 amendment to the Patent Act, which expressly added "damages the complainant has sustained" as a form of recovery in equitable actions.[179] At first, this addition was construed as a modest expansion of monetary recovery that authorized equity courts to augment an award where, for example, "the business of the infringer was so improvidently conducted that it did not yield any substantial profits" or the infringer had engaged in predatory pricing.[180] During this time, disgorgement of the defendant's profits remained the preferred measure.[181] Those unable to demonstrate the infringer's profits (or a cost savings that resulted in profits) could not recover a reasonable royal-

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173 Livingston v. Woodworth, 56 U.S. (15 How.) 546, 559 (1854) (explaining that only the infringer's actual gains could be calculated and awarded and that equity did not provide any authority to impose a monetary penalty).

174 *See* Gen. Motors Corp. v. Devex Corp., 461 U.S. 648, 654 (1983) ("A patent owner's ability to recover the infringer's profits reflected the notion that he should be able to force the infringer to disgorge the fruits of the infringement even if it caused him no injury.").

175 *Root*, 105 U.S. at 194-95.

176 *Livingston*, 56 U.S. at 559.

177 *Root*, 105 U.S. at 194; *see also* Rubber Co. v. Goodyear, 76 U.S. (9 Wall.) 788, 804 (1870) ("The controlling consideration is, that he shall not profit by his wrong. A more favorable rule would offer a premium to dishonesty, and invite to aggression.").

178 *Livingston*, 56 U.S. at 559 ("If the [patentees] had sustained an injury to their legal rights, the courts of law were open to them for redress . . . .").

179 *See* Patent Act of 1870, ch. 230, § 55, 16 Stat. 198, 206 (1870) ("[T]he *claimant* [complainant] shall be entitled to recover, in addition to the profits to be accounted for by the defendant, *the damages the complainant has sustained thereby*, and . . . the court shall have the same powers to increase the same in its discretion that are given by this act to increase the damages found by verdicts in actions upon the case . . . ." (second alteration in original) (second emphasis added)). This language was repeated in the 1922 version of the Patent Act. *See* Patent Act of 1922, ch. 58, § 8, 42 Stat. 389, 392 (1922) (codified at 35 U.S.C. § 70 (1925)).

180 Birdsall v. Coolidge, 93 U.S. 64, 69 (1876).

181 *Id.* (stating that after the passage of the 1870 Patent Act, "[g]ains and profits are still the proper measure of damages in equity suits, except in cases where the injury sustained by the infringement is plainly greater than the aggregate of what was made by the respondent").

ty.[182] Further, the infringer's liability was limited by the actual, rather than anticipated, profits.[183]

At about this same time, some court opinions considered monetary awards in equity as compensatory in nature, rather than as the imposition of a constructive trust. For example, in 1871 the Supreme Court observed in *Mowry v. Whitney*:[184]

> The profits which are recoverable against an infringer of a patent are in fact a compensation for the injury the patentee has sustained from the invasion of his right. They are the measure of his damages. Though called profits, they are really damages . . . .[185]

This shift away from the constructive trust theory of equitable monetary relief was reinforced in the 1881 *Root v. Railway Co.*[186] decision. Specifically, the *Root* Court explained that an award of the infringer's profits amounted to a "rule of computation and measurement" to allow the patentee complete relief without filing a duplicative action at law, rather than an amount held in a fictive trust.[187]

2. Actions at Law: Patentee Compensation

The primary relief for actions filed at law was the actual damage sustained by the patentee. This measure was described in different ways.[188] The first, enacted in 1790, stated that the patentee was entitled to "such damages as shall be assessed by a jury."[189] The 1793 Act specifically keyed damages to the amount that "the patentee has usually sold or licensed to other persons."[190] In 1836, the Act reverted to the more general term "damages."[191]

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182 *See* Keystone Mfg. Co. v. Adams, 151 U.S. 139, 148 (1894) (holding that there could be no recovery where patentee failed to demonstrate the infringer's profit because evidence of other manufacturer's profits was not sufficient); Black v. Thorne, 111 U.S. 122, 124 (1884) (holding that damages may only be nominal in absence of proof of a license-fee payment); Elizabeth v. Pavement Co., 97 U.S. 126, 138-39 (1878) (noting that cost savings that contributed to the infringer's general profitability are recoverable in equity).

183 *See, e.g.*, Tilghman v. Proctor, 125 U.S. 136, 146 (1888) ("The infringer is liable for actual, not for possible gains. The profits, therefore, which he must account for, are not those which he might reasonably have made, but those which he did make . . . ."); *Elizabeth*, 97 U.S. at 138 ("[I]f an infringer of a patent has realized no profit from the use of the invention, he cannot be called upon to respond for profits; the patentee, in such case, is left to his remedy for damages.").

184 81 U.S. (14 Wall.) 620 (1872).

185 *Id.* at 653.

186 105 U.S. 189 (1882).

187 *Id.* at 214.

188 *See supra* note 159.

189 Patent Act of 1790, ch. 7, § 4, 1 Stat. 109, 111 (1790).

190 Patent Act of 1793, ch. 11, § 5, 1 Stat. 318, 322 (1793).

191 Patent Act of 1836, ch. 357, § 14, 5 Stat. 117, 123 (1836).

The preferred method of calculating damages in actions at law was the patentee's established licensing rate.[192] Where a patentee did not license the patent but chose to exercise control over the invention by market exclusivity, courts used the infringer's profits as the measure of the plaintiff's recovery.[193]

3. The Development of a Reasonable Royalty

Patentees in both legal and equitable actions were sometimes unable to meet the standards for monetary relief. Over time, a disparity developed in court treatment of such cases. In one line of cases, the Court required evidence of an established licensing rate or actual harm to the market to recover anything more than nominal damages.[194] For example, in the 1895 case *Coupe v. Royer*,[195] the Supreme Court reversed a jury verdict based on an instruction that allowed consideration of the defendant's anticipated profits. The *Coupe* Court explained, "the evidence disclos[es] the existence of no license fee, no impairment of plaintiffs' market, in short, no damages of any kind, we think the court should have instructed the jury . . . to find nominal damages only."[196] Some lower courts interpreted *Coupe* to prevent damages in the form of a reasonable royalty and to bar general evidence of an invention's value in favor of an award limited to nominal damages.[197]

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192 *See* Clark v. Wooster, 119 U.S. 322, 325 (1886) ("It is a general rule in patent causes, that established license fees are the best measure of damages that can be used."); Birdsall v. Coolidge, 93 U.S. 64, 70 (1876) (acknowledging that "[e]vidence of an established royalty will undoubtedly furnish the true measure of damages in an action at law" although the amount might vary); *see also* Rude v. Wescott, 130 U.S. 152, 165 (1889) (defining an established royalty); Burdell v. Denig, 92 U.S. 716, 720 (1876) (stating the legal court's preference for awarding damages based on an established license rate); Packet Co. v. Sickles, 86 U.S. (19 Wall.) 611, 617 (1874) (finding that established license fee was the proper measure of damages). Lost profits did not become common until after the turn of the twentieth century. *See, e.g.*, Oil Well Improvements Co. v. Acme Foundry & Mach. Co., 31 F.2d 898, 901 (8th Cir. 1929) (allowing lost profits as a form of recovery).

193 Seymour v. McCormick, 57 U.S. (16 How.) 480, 489 (1854) (stating that where the patentee holds his patent as a "close monopoly," then "the profit of the infringer may be the only criterion of the actual damage of the patentee"); *see also Burdell*, 92 U.S. at 720 (stating that the infringer's profits can be considered general evidence of a patentee's harm in the absence of an established royalty).

194 *See* Coupe v. Royer, 155 U.S. 565, 583 (1895); *Rude*, 130 U.S. at 167.

195 155 U.S. 565 (1895).

196 *Id.* at 583.

197 *See, e.g.*, Brown v. Lanyon, 148 F. 838, 842 (8th Cir. 1906) (holding that there can be no recovery in an action at law where the plaintiff cannot demonstrate lost sales or an established royalty); City of Boston v. Allen, 91 F. 248, 250 (1st Cir. 1898) (rejecting proof of the value of the invention and limiting the plaintiff to nominal damages); Houston, E. & W.T. Ry. Co. v. Stern, 74 F. 636, 639-40 (5th Cir. 1896) (reversing a lower court decision limiting the plaintiff to nominal damages); *see also* Whittemore v. Cutter, 29 F. Cas. 1123, 1125 (C.C.D. Mass. 1813) (noting that in the absence of pecuniary loss, only nominal damages should be awarded).

In contrast, a separate line of cases allowed general evidence of the invention's value, a concept that developed into the modern reasonable royalty form of recovery.[198] Significantly, in the 1865 *Suffolk Co. v. Hayden*[199] decision, the Supreme Court affirmed a jury instruction that allowed examination of "the utility and advantages of the invention over the old modes or devices that had been used for working out similar results" in a case where no evidence of either an established license rate or market harm to the patentee was present.[200]

In the 1915 case *Dowagiac Manufacturing Co. v. Minnesota Moline Plow Co.*,[201] the Supreme Court decided a case in equity that resolved any discrepancy between *Coupe* and *Suffolk*.[202] To further the then-established compensatory purpose of equitable monetary relief, the *Dowagiac* Court adopted a reasonable royalty form of recovery, siding with *Suffolk* and its progeny.[203] Notably, the *Dowagiac* Court was sensitive to the problem of awarding the patentee no more than the patentee contributed to the infringer's sales. In that case, the claim was directed to a device called a grain drill, which was used to plant seed.[204] The *Dowagiac* Court noted "the patent was not for a new and operative grain drill, but only for particular improvements in a type of grain drill then in use and well known."[205] Rejecting the argument that the entire market value rule warranted awarding the patentee all of the infringer's profits, the *Dowagiac* opinion instead directed that "the result to be accomplished is a rational separation of the net profits so that neither party may have what rightly belongs to the other."[206] Placing the burden of apportionment on the patentee, the Court stated, "In the nature of things the profits pertaining to the patented improvements had to be ascertained before they could be recovered by the plaintiff, and therefore it was required to take the initiative in presenting evidence looking to an apportionment."[207] As no lost profits or established royalty had been shown, the *Dowagiac* Court remanded the case to enable the patentee to demon-

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198 *See, e.g.*, U.S. Frumentum Co. v. Lauhoff, 216 F. 610, 616-17 (6th Cir. 1914); Hunt Bros. Fruit-Packing Co. v. Cassiday, 64 F. 585, 587 (9th Cir. 1894).

199 70 U.S. (3 Wall.) 315 (1866).

200 *Id.* at 320; *see also* Brickill v. Mayor of Balt., 60 F. 98, 101, 103 (4th Cir. 1894) (affirming a similar jury instruction to *Hayden*). *See generally* Lee, *supra* note 10, at 20-23 (detailing this conflict in the case law surrounding the reasonable royalty).

201 235 U.S. 641 (1915).

202 *See id.* at 648-49.

203 *Id.* at 648 (noting that a reasonable royalty was the appropriate basis for calculating an award in the absence of an established royalty). In the opinion, the *Dowagiac* Court cited with approval *Cassidy v. Hunt*, 75 F. 1012 (C.C.N.D. Cal. 1896), an action at law which affirmed a damages award based on a reasonable royalty to calculate the value of the patentee's loss. *Dowagiac*, 235 U.S. at 649-50.

204 *Dowagiac*, 235 U.S. at 643, 645.

205 *Id.* at 644-45.

206 *Id.* at 647.

207 *Id.* at 646.

strate "the value of what had been taken," using general evidence of "what would have been a reasonable royalty, considering the nature of the invention, its utility and advantages, and the extent of the use involved."[208] In this way, the overall structure of the *Dowagiac* opinion evidences cognizance that the patentee's contribution to the art is a gating question in the reasonable royalty inquiry.

Dowagiac was not the first case to balance the contribution of both parties in determining the monetary award. Rather, this treatment echoed earlier cases that, after rejecting the applicability of the entire market value rule based on the facts presented, limited the patentee's recovery to the value provided by the invention.[209] One very early decision, *Mowry v. Whitney*, examined the amount of profits to be awarded to the patentee, Whitney, for infringement of claim for a multistep process for making a wheel.[210] The claim's inventive aspect was in the final step, which increased durability of the final product.[211] The *Mowry* Court rejected the patentee's efforts to recover the infringer's profits, framing the relevant inquiry as follows:

> The question to be determined in this case is, what advantage did the defendant derive from using the complainant's invention over what he had in using other processes then open to the public and adequate to enable him to obtain an equally beneficial result. The fruits of that advantage are his profits. They are all the benefits he derived from the existence of the Whitney invention.[212]

Another pre-*Dowagiac* case, *Dunn Manufacturing Co. v. Standard Computing Scale Co.*,[213] noted the "common rule that the entire profits cannot be awarded, as of right, without proof and finding of the fact that the sale was due to the presence of the feature which distinguished the device from the prior art," where the infringed claim included both inventive and public domain features.[214] Other cases predating *Dowagiac* reflect this same principle.[215]

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208 *Id.* at 648.

209 *See infra* note 215.

210 Mowry v. Whitney, 81 U.S. (14 Wall.) 620, 621 (1872).

211 *Id.* at 637.

212 *Id.* at 651.

213 204 F. 617 (6th Cir. 1913).

214 *Id.* at 619 ("[T]he question of profits can hardly depend on the largely fortuitous language of the claim in extending the combination, instead of on the actual advance in the art."). The *Dunn* court further noted that damages would have been calculated based on some percentage of profits, or another appropriate measure, on remand. *Id.* at 623-24.

215 Herman v. Youngstown Car Mfg. Co., 216 F. 604, 607 (6th Cir. 1914) ("In determining the liability for profits, as well as in determining validity and scope, we must give due regard to the real invention—the real contribution or step in advance which the patentee has made—and the due effect of this consideration should not be obscured by the language in which the claim is clothed."); Seeger Refrigerator Co. v. Am. Car & Foundry Co., 212 F. 742, 751 (D.N.J. 1914) ("[T]he owner of the patent in seeking only to recover profits from an infringer of the combination is limited to the excess of profits

After *Dowagiac* was decided, the lower courts continued to recognize that the patent's contribution should be isolated to determine the value of what had been taken. For example, in 1928, in *Egry Register Co. v. Standard Register Co.*,[216] the Sixth Circuit found that the district court erred in awarding the patentee an amount of the infringer's entire profit, stating:

> [T]he important matter in this connection was the actual invention compared with the prior art, rather than the terms in which the claims may be formulated. . . . [The patentee] cannot, by the language which his claim happens to take, transform his invention of an improvement in an existing structure into one of a complete structure, as if it were wholly new, so as to entitle him to profits upon these parts of it which are not in any fair sense his invention.[217]

In *Horvath v. McCord Radiator & Manufacturing Co.*,[218] the patentee brought an action in equity, seeking the infringer's profits for the sale of a spinal fin tubing to disperse heat in radiators.[219] The *Horvath* Court denied this relief, instead limiting the patentee to an amount that represented the value of the improvement compared to public domain solutions. In doing so, the opinion evaluating prior art solutions and explained:

> The merits of Horvath's invention were largely a savings in the expense of material and labor entering into the manufacture of spiral fin tubing and a superior product. He was not the discoverer of spiral fin tubing. Other inventors, long his predecessors, had invented machines on which such tubing was made.[220]

These cases implemented the reasonable royalty with the recognition that the patent's contribution should be isolated before a reasonable royalty valuation is performed.[221] The courts applied this standard with cognizance that relief should be awarded based on "what plaintiff's patent property was,"

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realized by him from the manufacture, use or sale of the mechanism, as so improved, over what he might or would have made from the manufacture, use or sale of the old mechanical combination."), *rev'd on other grounds*, 219 F. 565 (3d Cir. 1915); *see also* McCreary v. Pa. Canal Co., 141 U.S. 459, 463 (1891).

216 23 F.2d 438 (6th Cir. 1928).

217 *Id.* at 440-41.

218 100 F.2d 326 (6th Cir. 1938).

219 *Id.* at 329.

220 *Id.* at 330.

221 The damages rules described previously were retained during this era. Reasonable royalties were typically awarded where other forms of recovery failed, for example, where a patentee could not establish entitlement to an infringer's entire damages or demonstrate lost profits. *See, e.g.*, Crosby Steam Gage & Valve Co. v. Consol. Safety Valve Co., 141 U.S. 441, 448 (1891) (finding that the patented valve used by the infringer were responsible for his entire sales); Wales v. Waterbury Mfg. Co., 101 F. 126, 127 (2d Cir. 1900) (noting that the patent's contribution to the prior art was responsible for the entire value of the infringer's sales, as "other buckles, which were open to public use, could have been attached," but that "the patented buckle was peculiarly adapted for the purpose" implemented into the infringing devices).

together with other evidence akin to that used in today's *Georgia-Pacific* test.[222] In 1922, the Patent Act was amended to authorize courts to award "a reasonable sum as profits or general damages for the infringement."[223] This "reasonable sum" is the legislative parallel of the reasonable royalty established in *Dowagiac*. Notably, cases decided after this enactment continued to apportion damages according to *Dowagiac*.[224] This demonstrates the judicial understanding that apportionment was an established doctrine underlying monetary remedies for patent infringement.

Dowagiac's reasonable royalty represented a retreat from an earlier decision, *Westinghouse Electric & Manufacturing Co. v. Wagner Electric & Manufacturing Co.*,[225] which was perceived as delivering very harsh consequences for infringers.[226] Specifically, *Westinghouse* considered the applicable rule of determining the defendant's profits where the infringed claim represented only a portion of the infringing product.[227] *Westinghouse* held that the infringer bore the burden of apportionment, and where such allocation was impossible, the infringer owed the patentee the entire profit.[228] Under *Westinghouse*, a patentee who had demonstrated an inability to apportion might obtain more than the invention's worth, based on the principle that "[t]he loss had to fall on the innocent or the guilty. In such an alternative the law places the loss on the wrongdoer."[229] Significantly, the *Dowagiac* decision did not expressly overrule *Westinghouse*. That reversal did not occur until the damages statute was amended in 1946.[230]

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222 U.S. Frumentum Co. v. Lauhoff, 216 F. 610, 617 (6th Cir. 1914) (listing other factors, including the extent of defendant's use, the invention's advantages over other things, profits and savings from the invention's use, the realizable profit creditable to the manufacturing process and business risk (compared to the patent), and the share of the profits or of the selling price that may be customary in the business, as well as expert testimony). Early decisions also relied on estimates of a hypothetical negotiation between the parties as a proxy for the value of the invention. *See, e.g.*, Reynolds Spring Co. v. L.A. Young Indus., Inc., 101 F.2d 257, 261-62 (6th Cir. 1939); *Horvath*, 100 F.2d at 335-36; Merrell Soule Co. v. Powdered Milk Co., 7 F.2d 297, 300 (2d Cir. 1925).

223 Patent Act of 1922, ch. 58, § 8, 42 Stat. 389, 392 (1922) (providing for the award of a "reasonable sum" as profits or general damages for the infringement) (codified at 35 U.S.C. § 70 (1925)).

224 *See* Perrine v. Burdick, 138 F.2d 861, 866 (8th Cir. 1943) (apportioning profits based on the difference between the claim at issue and the prior art); Swan Carburetor Co. v. Nash Motors Co., 133 F.2d 562, 565 (4th Cir. 1943) (acknowledging the rule that "when the patent has created only a part of the profits, the plaintiff's recovery is limited thereto"); Stearns-Roger Mfg. Co. v. Ruth, 87 F.2d 35, 39 (10th Cir. 1936); Alliance Sec. Co. v. De Vilbliss Mfg. Co., 76 F.2d 503, 504 (6th Cir. 1935) ("[T]he invention is to be measured, not by the language of the claims, but by the advance over the prior art . . . .").

225 225 U.S. 604 (1912).

226 *See id.* at 614-15 (describing the rule for measuring damages).

227 *Id.*

228 *Id.* at 620.

229 *Id.* at 619.

230 *See* 35 U.S.C. §§ 67, 70 (1946) (allowing the court to enter judgment awarding "actual damages sustained, according to the circumstances of the case").

Dowagiac's response to *Westinghouse* became a focal point during the hearings that led to the 1946 amendments to the damages provision of the Patent Act. The hearings on the proposed amendment commenced with a letter read by the bill's sponsor describing that, under *Westinghouse*, a patentee seeking recovery of profits "gets in very many cases enormously more than that to which he is really entitled."[231] The hearing statements credited *Dowagiac* as having "introduced a thought that the Court might well determine what was a fair and reasonable compensation to the patentee, on general evidence," as a "matter of damages rather than of profits."[232] Not surprisingly, *Dowagiac* and the reasonable royalty were not the contentious issues in the hearing transcripts that led to the 1946 amendment.[233] That may be due to the fact that *Dowagiac* had become woven into the fabric of the Patent Act in 1922.[234]

Ultimately, the 1946 amendment to the Patent Act eliminated disgorgement of profits and rendered *Westinghouse*'s harsh damages rules moot.[235] The amended act allowed patentees "to recover general damages, which shall be due compensation for making, using, or selling the invention, not less than a reasonable royalty therefor."[236] This was carried forward into the current version of the Patent Act without substantive change.[237] This history demonstrates that *Dowagiac*'s conception of the reasonable royalty became a feature of the current Patent Act, although *Westinghouse* did not.[238] The legal context of this amendment, including the precedents that it incorporates, demonstrates that a reasonable royalty was awarded on the patentee's contribution to the art. Thus, it cannot be said that requiring a correlation between the patentee's contribution and the rea-

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231 *Recovery in Patent Infringement Suits: Hearing Before the H. Comm. on Patents on H.R. 5231*, 79th Cong. 3 (1946) (statement by Hon. Robert K. Henry (Wisc.)); *id.* at 8 (statement of Condor C. Henry, Assistant Comm'r of Patents).

232 *Id.* at 3 (statement by Hon. Robert K. Henry (Wisc.)); *see also id.* at 8 (statement of Condor C. Henry, Assistant Comm'r of Patents) (describing *Westinghouse* as problematic and *Dowagiac*'s subsequent reasonable royalty holding). This statement was endorsed by the then-Chairman of the Committee on Legislation for the American Bar Association. *Id.* at 14 (statement of Chester L. Davis, Chairman of the Committee on Legislation for the Patent Section of the American Bar Association).

233 *Id.* at 11 (statement of George E. Folk, Patent Adviser to the National Association of Manufacturers) (discussing the cost of patent litigation as the main impetus behind the reform bill).

234 *Compare* Dowagiac Mfg. Co. v. Minn. Moline Plow Co., 235 U.S. 641, 649 (1915) (noting that a "reasonable royalty" should be awarded in the absence of evidence of lost profit), *with* Patent Act of 1922, ch. 58, § 8, 42 Stat. 389, 392 (providing for the award of a "reasonable sum" as profits or general damages for the infringement) (codified at 35 U.S.C. § 70 (1925)).

235 *See* Gen. Motors Corp. v. Devex Corp., 461 U.S. 648, 654 (1983) ("In 1946 Congress excluded consideration of the infringer's gain by eliminating the recovery of his profits . . . .").

236 *See* 35 U.S.C. §§ 67, 70 (1946).

237 *See Gen. Motors*, 461 U.S. at 652 n.6.

238 *See* H.R. REP. NO. 79-1587, at 1-2 (1946) (noting that the bill was intended to eliminate proceedings before masters, which "in many cases result in complete failure of justice," in favor of court awards of general damages "not less than a reasonable royalty").

sonable royalty for its use would "transform patent rights into something far different, and far less valuable, than the nation's founders intended."[239]

Current case law frames the reasonable royalty as a way to provide the patentee with economic compensation for infringement of the "claimed invention"[240] or "patented feature"[241] without pausing to examine a patentee's specific contribution to the field. Although *Georgia-Pacific* recognizes that the invention's value is assessed in terms of the patentee's contribution over the prior art,[242] modern applications of the reasonable royalty have passed over the statute's language and purpose by failing to isolate the patentee's contribution prior to valuation.

IV. APPORTIONMENT AND THE ECONOMICS OF IMPROVEMENT

Intellectual property law is concerned with the question of knowledge creation in the aggregate.[243] Innovators commercialize, build on, or accelerate their own new developments based on the work of prior inventors.[244] As Professors Robert Merges and Richard Nelson discuss, "multiple and competitive sources of invention are socially preferable to a structure where there is only one or a few sources."[245]

Professor Mark Lemley's *The Economics of Improvement in Intellectual Property Law* builds on the work of Nelson and Merges and is founded on the premise that knowledge creation is cumulative.[246] Pointing out that the efficient creation of new works necessarily adds onto that which came before, his work points out that dynamic efficiency counsels in favor of allowing later inventors to obtain access to prior works.[247] As he explains, intellectual property rights limit this access and, coupled with notice prob-

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239 *See Hearing*, *supra* note 3, at 111 (statement of Bernard J. Cassidy, Senior Vice President & Gen. Counsel, Tessera, Inc.).

240 *See* ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010) (per curiam); Lucent Techs., Inc. v. Gateway, Inc., 580 F.3d 1301, 1334 (Fed. Cir. 2009) (assessing a reasonable royalty, noting that the law has "the requisite focus on the *infringed claim*" (emphasis added)).

241 *Lucent Techs.*, 580 F.3d at 1332.

242 *See* Ga.-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (listing factor nine, which considers "[t]he utility and advantages of the patent property over the old modes or devices, if any, that had been used for working out similar results").

243 *See, e.g.*, SUZANNE SCOTCHMER, INNOVATION AND INCENTIVES 31 (2004); Lemley, *supra* note 31, at 995; Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 843 (1990) (contrasting the use of patents in encouraging information with traditional "public goods").

244 SCOTCHMER, *supra* note 243, at 127 (describing cumulative invention scenarios); *see also* Blair & Cotter, *supra* note 87, at 46 (recognizing that one cost of an intellectual property system is that it "raise[s] the cost of creating follow-up innovations based upon a pioneering invention").

245 Merges & Nelson, *supra* note 243, at 908.

246 *See generally* Lemley, *supra* note 31.

247 *See id.* at 997.

lems and transaction costs, impose costs on later improvers that they would not incur in their absence.[248] The article recognizes the critical point that the cumulative nature of patented advances requires access to older work, otherwise "the societal costs in terms of reinvention would be enormous."[249]

Achieving a workable patent system requires a balance between preserving incentives for the initial inventor and minimizing the detrimental impact to subsequent improvers.[250] The problem of adequate incentives and the damages inquiry has not yet been fully resolved. Some suggest that damages law be implemented in light of the system's incentive structure.[251] Other writings explain that the patent system's incentive structure is not optimally implemented at present and, to the extent that it exists, is context dependent and perhaps industry specific.[252] One scholar has raised doubts about whether the question of optimal incentives can be answered at all.[253]

The question of incentives must encompass a concern for sequential invention in order to fully conform with the central purpose of the patent system.[254] Earlier patents have the potential to bar subsequent developments for those who later seek to push an art forward.[255] Subsequent innovators play a critical role in knowledge creation and have an incentive to develop

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248 *Id.* As the article acknowledges, the incentive theory is the primary justification for the imposition of these costs. *Id.* at 993. For more about transaction costs for sequential invention, see Clarisa Long, *Proprietary Rights and Why Initial Allocations Matter*, 49 EMORY L.J. 823, 826-27 (2000).

249 Lemley, *supra* note 31, at 997.

250 *See, e.g.*, J.H. Reichman, *Of Green Tulips and Legal Kudzu: Repackaging Rights in Subpatentable Innovation*, 53 VAND. L. REV. 1743, 1755-56 (2000) ("[T]here is continuing debate about the ability of even the mature patent and copyright paradigms to satisfactorily balance public and private interests in promoting follow-on innovation.").

251 *See, e.g.*, Golden, *supra* note 1, at 523. *But see* Thomas F. Cotter, *Patent Holdup, Patent Remedies, and Antitrust Responses*, 34 J. CORP. L. 1151, 1159 (2009) (arguing for a neutral approach).

252 The literature analyzing patents as an incentive system is too voluminous to list. Some recent literature exploring the question includes Stuart J.H. Graham et al., *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 BERKELEY TECH. L.J. 1255 (2009), and Robert P. Merges, *Software and Patent Scope: A Report from the Middle Innings*, 85 TEX. L. REV. 1627 (2007) (considering the impact of software patenting on the software industry). There have been several recent books that consider the patent system's values as an incentive system. *See, e.g.*, JAMES BESSEN & MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2008); DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT (2009); ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT (2004).

253 *See* Paul J. Heald, *Optimal Remedies for Patent Infringement: A Transactional Model*, 45 HOUS. L. REV. 1165, 1173 (2008) ("[N]o one has any idea how to calculate the optimal amount of R&D a firm should conduct.").

254 *See* Long, *supra* note 248, at 826-27.

255 *See* Robin C. Feldman, *The Insufficiency of Antitrust Analysis for Patent Misuse*, 55 HASTINGS L.J. 399, 435 (2003).

alternatives and variations that an initial inventor does not.[256] As has been observed, there is considerable value in fostering intellectual diversity, as "one might expect that many independent inventors will generate a much wider and diverse set of explorations than when the development is under the control of one mind or organization."[257]

To effectuate the overall purpose of the system, patent law should endeavor to accommodate the progress of science. Currently, patent law has no fair use doctrine, and the doctrine of experimental use outside the pharmaceutical field is quite narrow.[258] Permitting patentees to recover for more than is invented imposes higher costs on those engaged in independent research and innovation. If the subsequent improver's cost of engaging in parallel or subsequent activity is too high, the improver is likely to abandon that activity, foreclosing the possibility for greater consumer choice and subsequent improvements on the patentee's original design.[259] Although infringers must pay adequate compensation to patentees harmed by infringement, paying for more than the invention's value imposes burdens on subsequent improvers that are likely to affect downstream invention.

Further, apportionment reduces the possibility that the subsequent improver will pay more than once for the use of the same component in a technology area that is covered by overlapping patents. More broadly, the belief that more compensation translates to more invention loses sight of the importance of sequential invention.[260] Taken to the extreme, a singular focus on the initial inventor's incentive leads to gridlock, as inventors who seek to increase research and development budgets pay more to license in. The pace of technological development cannot flourish if it is dependent entirely on the expiration of patents, which may take up to twenty years.

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[256] *See* Robert P. Merges, *Rent Control in the Patent District: Observations on the Grady-Alexander Thesis*, 78 VA. L. REV. 359, 371-73 (1992). *See generally* Pino G. Audia & Jack A. Goncalo, *Past Success and Creativity Over Time: A Study of Inventors in the Hard Disk Drive Industry*, 53 MGMT. SCI. 1, 3 (2007) (noting that individuals who have experienced breakthrough success later shift toward making incremental improvements).

[257] Merges & Nelson, *supra* note 243, at 873.

[258] *See* Dan L. Burk & Brett H. McDonnell, *The Goldilocks Hypothesis: Balancing Intellectual Property Rights at the Boundary of the Firm*, 2007 U. ILL. L. REV. 575, 604 n.194 (2007) (noting the narrow nature, and possible elimination, of the experimental use doctrine).

[259] *See* Merges & Nelson, *supra* note 243, at 908 ("Public policy, including patent law, ought to encourage inventive rivalry, and not hinder it."); *see also* Cotter, *supra* note 251, at 1169 ("[E]nabling patentees to extract excessive rents from downstream users may inhibit investment on the part of downstream firms in developing new applications for patent- or standard-specific technologies. In a sense, producers of end products are not merely users of the patented invention, but rather might be thought of as sequential innovators." (emphasis omitted)).

[260] The U.S. Supreme Court recognized this central point in *KSR International Co v. Teleflex Inc.*, 550 U.S. 398 (2007), stating "[w]e build and create by bringing to the tangible and palpable reality around us new works based on instinct, simple logic, ordinary inferences, extraordinary ideas, and sometimes even genius. These advances, once part of our shared knowledge, define a new threshold from which innovation starts once more." *Id.* at 427.

Reducing damages to match a patentee's contribution allows the patent owner compensation for the harm suffered without imposing burdens on those who subsequently improve, modify, or extend the original invention.

Moreover, awarding compensation for technology that is not attributable to the inventive contribution misprices the claim. Mispricing sends inaccurate signals about a technology's value, which can distort incentives. Judgments based on misperceptions of a claim's worth have the potential to skew valuation assessments. Verdicts based on distorted information may encourage broad claiming and litigation rather than fostering invention.[261] Patents are not publicly traded, and information about private patent transactions typically remains so, making market correction unlikely.[262] Setting a patent's value to deviate from the market to increase patentee incentives should not be undertaken lightly without considering alternatives, such as direct research funding.

One counterposition asserts that incumbents should be favored based on the assertion that patents will be devalued with an accompanying negative impact on research and investment.[263] This view considers that if patents are not properly valued, infringers have incentives to infringe and inventors will lack incentives to create.[264] To clear some portion of this debate, it is well to recall that many patent infringement disputes arise from instances of independent invention.[265]

Concerning the impact of apportionment on research and development, one study performed by Scott Shane ("Shane Study") was conducted on behalf of an industry association.[266] The study combines patent valuation data with the median responses of a random selection of patent attorneys who were asked to estimate the potential impact of apportionment on future jury awards.[267] The study concludes that apportionment "would result in a decrease of between $225.4 billion and $431.2 billion of the value of public corporations."[268] Additionally, this study projects that apportionment may drive patent holders to reduce research and development expenditures, the

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261 *See Hearing*, *supra* note 3, at 77 (statement of John R. Thomas, Professor of Law, Georgetown University).

262 *See* Perry J. Viscounty et al., *Patent Auctions: Emerging Trend?*, NAT'L L.J., May 8, 2006, at 35, 35 (discussing the difficulties of private patent exchanges).

263 *See* Scott Shane, The Likely Adverse Effects of an Apportionment-Centric System of Patent Damages 4 (Jan. 14, 2009) (paper prepared for the Manufacturing Alliance on Patent Policy), *available at* http://www.ftc.gov/os/comments/iphearings/540872-00014.pdf.

264 Elhauge, *supra* note 111, at 559; Golden, *supra* note 1, at 531; J. Gregory Sidak, *Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro*, 92 MINN. L. REV. 714, 735 (2008).

265 *See* Cotropia & Lemley, *supra* note 124, at 1423.

266 Shane, *supra* note 263, at 1.

267 *Id.* at 9 n.2.

268 *Id.* at 4.

number of employees, and/or the level of employee compensation and benefits.[269] The Shane Study states:

> Another significant employment impact is opportunity cost—jobs which would not be created in the United States in the future. As patent holders perceive reduced value in patents and patented technology as a result of the apportionment of damages legislation, they would be less willing to add employees to produce new technology, as well as to supply new plant, equipment, components and services.[270]

The conclusion drawn by the Shane Study rests on a series of assumptions that lead to highly questionable conclusions. Under present valuation standards, it is not clear that attorney assessments of the potential impact on jury awards are a reliable starting point.[271] First, the Shane Study does not disclose the respondents' experience with jury damage awards or patent valuation. Second, projecting jury awards prospectively is fraught with uncertainty.[272] Third, using current jury valuation principles as a benchmark reflects an upward skew from a misapplication of the current statute. Finally, appellate scrutiny of damage awards has been lacking for decades[273] and, therefore, provides an uncertain foundation to understand economically sound patent valuation.

Perhaps one of the most problematic aspects of the Shane Study's conclusions is the singular focus on the existing rights of incumbent patent holders.[274] The economic and creative framework for inventive activity is far more complex, a circumstance which sheds doubt on the Shane Study's conclusions. The most glaring omission is the failure to account for the economic activity of non-patent holders and subsequent inventors and innovators. Currently, subsequent improvers are taxed with payments for portions of patents that are not the patentee's contribution.[275] Lowering the

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269 *Id.* at 4-6.

270 *Id.* at 6.

271 *See* Durie & Lemley, *supra* note 1, at 628 (highlighting that damage calculation is often contentious and borders on overcompensation).

272 Predicting jury awards for intangibles in civil cases can be a difficult endeavor, otherwise one would expect nearly all of them to settle. *See generally* Christopher Buccafusco & Christopher Sprigman, *Valuing Intellectual Property: An Experiment*, 96 CORNELL L. REV. 1, 2-4, 17-31 (2010) (describing a study that suggests that the valuation problem is particularly difficult for intellectual property cases).

273 *See* Rochelle Cooper Dreyfuss, *The Federal Circuit: A Case Study in Specialized Courts*, 64 N.Y.U. L. REV. 1, 12 (1989) ("[T]he CAFC has tended to hide behind the skirts of the district courts, refusing to overturn awards without a showing of abuse of discretion by the trial judge.").

274 *See* Shane, *supra* note 263, at 2.

275 These legal theories are consistent with research performed in other fields, including the psychology of scientific creativity and sociology. *See generally* Landers, *supra* note 29, at 37-69 (summarizing relevant literature). Such research demonstrates that solutions derive from an existing knowledge base, coupled with experimentation, chance, the application of domain-specific expertise, and the ability to take intellectual risk.

financial risk for those engaged in near-simultaneous or subsequent inventive and innovative activity frees room for research and development by third parties. Further, incumbent patentees that produce goods will obtain an offset from lower financial risk from assertions of patent infringement.

If apportionment is adopted, the indeterminate process of knowledge creation may open in ways that the current system cannot contemplate. In other words, by overvaluing current assets, opportunities for undertaking risk in new markets may currently be foreclosed. Lowering costs associated with experimentation by cabining current patents to the value of their actual contribution may, in the end, open up research and development and, assuming the presence of other conditions, job growth.

V. THE APPORTIONMENT DECISIONMAKER: JUDGE OR JURY?

One salient question is whether apportionment should be performed by a court or a jury. Previous versions of proposed Patent Reform legislation would have authorized judges to apportion as part of the court's gatekeeping role of ensuring that only relevant evidence reaches a jury.[276] This is consistent with established practice. That is, the court's identification of the portion of a claim to be valued prevents the irrelevant and prejudicial value of third-party inputs from contaminating a jury's damages ruling. Certainly judges make far more fact-intensive decisions routinely without a jury, such as those involving contract interpretations,[277] geographical facts demonstrating personal jurisdiction,[278] and whether an expert possesses sufficient qualifications to meet the *Daubert* standard.[279]

The Seventh Amendment, which governs to the right to jury trials in civil cases, may be implicated.[280] It does not establish a right to jury trial in all civil cases, but instead it preserves the right as existent at the time of the amendment's ratification in 1791.[281] At a minimum, the right to a jury trial

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276 *See, e.g.*, Patent Reform Act of 2009, H.R. 1260, 111th Cong. § 5 (2009); Patent Reform Act of 2008, S. 1145, 110th Cong. § 4 (2007).

277 *See* Ronald J. Allen & Michael S. Pardo, *The Myth of the Law-Fact Distinction*, 97 NW. U. L. REV. 1769, 1782 (2003) (discussing the ways that judges make fact-based determinations in contract cases).

278 *See, e.g.*, Vetrotex Certainteed Corp. v. Consol. Fiber Glass Prods. Co., 75 F.3d 147, 150-51 (3d Cir. 1996).

279 Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592-93 (1993); *cf.* Allen & Pardo, *supra* note 277, at 1769-70 (discussing the indeterminate line between fact and law).

280 U.S. CONST. amend. VII ("In Suits at common law . . . the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.").

281 Allen & Pardo, *supra* note 277, at 1779-80.

is compelled in "suits at common law."[282] Although this language appears to encompass entire causes of action, courts have interpreted it to require a more narrow analysis of the specific issue to be tried.[283] The Court has employed this analysis in the patent field, where it separated the issue of claim construction from infringement for its Seventh Amendment analysis in *Markman v. Westview Instruments, Inc.*[284]

Furthermore, where the Seventh Amendment counsels in favor of trial by jury, the jury decides issues of fact and the court decides issues of law.[285] Thus, even if one concludes that the Seventh Amendment weighs in favor of finding a trial by jury, the issue must be further categorized as either legal (for the court) or factual (for a jury).

Generally, the Seventh Amendment inquiry is a multipart examination. First, a historical component examines whether the issue, or one analogous to it, was tried by a jury at common law in 1791.[286] As part of the analysis, the issue is categorized according to the nature of relief requested by the plaintiff to determine whether it was heard in the courts of law or equity.[287] If the issue was tried in the courts of law, then the issue was tried by a jury; if equitable, to the court.[288] This component of the test is not literally applied; rather one accounts for the merger of law and equity.[289] Second, if the first part of the analysis does not resolve this question then a number of functional and pragmatic considerations guide the result.[290]

Typically, courts have concluded that the Seventh Amendment dictates that juries decide the level of compensatory damages in civil actions.[291] However, not all issues relating to monetary relief have been held to warrant Seventh Amendment treatment, as demonstrated by the Supreme

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282 *See* Mary Kay Kane, *Civil Jury Trial: The Case for Reasoned Iconoclasm*, 28 HASTINGS L.J. 1, 4 (1976) ("[A] jury trial cannot be denied where the action must be so classified.").

283 Ross v. Bernhard, 396 U.S. 531, 538 (1970) ("The Seventh Amendment question depends on the nature of the issue to be tried rather than the character of the overall action.").

284 517 U.S. 370, 376 (1996).

285 Allen & Pardo, *supra* note 277, at 1779-80; *cf.* William W. Schwarzer, *Summary Judgment Under the Federal Rules: Defining Genuine Issues of Material Fact*, 99 F.R.D. 465, 468-69 (1984) (discussing the distinction between factual and legal issues).

286 *See* Chauffeurs, Teamsters & Helpers Local No. 391 v. Terry, 494 U.S. 558, 565 (1990).

287 *See* Tull v. United States, 481 U.S. 412, 417-18 (1987). *See generally* Patrick Devlin, *Jury Trial of Complex Cases: English Practice at the Time of the Seventh Amendment*, 80 COLUM. L. REV. 43, 45-57 (1980) (providing an overview of the practice of English courts of that era).

288 *Tull*, 481 U.S. at 417; *see also* Martin H. Redish & Daniel J. La Fave, *Seventh Amendment Right to Jury Trial in Non-Article III Proceedings: A Study in Dysfunctional Constitutional Theory*, 4 WM. & MARY BILL RTS. J. 407, 414-15 (1995) (describing test).

289 *See* Ross v. Bernhard, 396 U.S. 531, 539-40 (1970).

290 *See* Allen & Pardo, *supra* note 277, at 1779-80 (noting that considerations include presumption in favor of jury trial, the importance of due process, ability of the jury to determine rational decisions with their understanding of the evidence).

291 *Cf.* Feltner v. Columbia Pictures Television, Inc., 523 U.S. 340, 348-51 (1998) (noting that juries have historically decided the amount of damages in copyright).

Court's *Cooper Industries, Inc. v. Leatherman Tool Group, Inc.*[292] holding that punitive damages are not an issue of fact for the jury.[293] It is not clear that apportionment, which identifies the technology to be valued, is within the jury's traditional role of setting the value for a compensatory loss. As the *Markman* decision suggests for the claim construction analysis, the court may be in a position to consider the consequences of the line drawing that will be required to implement apportionment.[294] Once that step is performed, a jury can then set the value of the identified contribution consistent with the Seventh Amendment.

Regarding the first step, the historical analysis, the reasonable royalty arose primarily from the equity courts during the mid- to late-1800s, although not exclusively so.[295] No reported patent decisions from the 1791 era appear to have considered apportionment. At that time in the United States, the patent system was only one year old and any actions brought during that time would likely have been legal.[296] In England during that era, jurors in the courts of law awarded monetary relief, and courts of equity could direct that an accounting be performed.[297] Yet the primary difficulty for relying on either of these proceedings in either country is that claiming did not become a prevalent patent practice until decades after the Seventh Amendment was ratified in the United States.[298] That is, apportionment was implemented after claiming became an established practice and monetary awards in equity became more common. Although at least one appellate decision characterizes reasonable royalty awards as equitable in nature,[299] this portion of the analysis appears to be inconclusive.

When the historic analysis provides no clear answers, functional considerations may inform whether the judge or jury is better suited to appor-

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292 532 U.S. 424 (2001).

293 *Id.* at 437.

294 *Cf.* Michael J. Meurer & Katherine J. Strandburg, *Patent Carrots and Sticks: A Model of Nonobviousness*, 12 LEWIS & CLARK L. REV. 547, 573-74 (2008) (discussing policy reasons to treat nonobviousness as an issue of law).

295 *See* John W. Schlicher, *Measuring Patent Damages by the Market Value of Inventions—The* Grain Processing*,* Rite-Hite*, and* Aro *Rules*, 82 J. PAT. & TRADEMARK OFF. SOC'Y 503, 505 (2000) (discussing the early sources of patent damages during the 1800s).

296 *See* Lutz, *supra* note 61, at 143 (suggesting that cases in equity were not brought in the United States until later than 1810).

297 *See* Devlin, *supra* note 287, at 65-72 (describing accounting procedures in the courts of equity); *see also* Corp. of Carlisle v. Wilson, (1807) 33 Eng. Rep. 297 (Ch.) 299 (explaining the reason for accounting although an action could be brought at law)

298 *See* Markman v. Westview Instruments, Inc., 517 U.S. 370, 376-78 (1996) (explaining the historical analysis of the law at the time of the Seventh Amendment and pointing out the use of jury trials in patent cases at that time).

299 Merrell Soule Co. v. Powdered Milk Co., 7 F.2d 297, 300 (2d Cir. 1925) (finding that a reasonable royalties were "damages . . . . recoverable in equity"); *see also* Ga.-Pac. Corp. v. U.S. Plywood-Champion Papers Inc., 446 F.2d 295, 302 n.10 (2d Cir. 1971) (same, citing *Merrell Soule*).

tion claims.[300] Asking the court to apportion the claim compared to the prior art is preferable because such an assessment may require the competence level of an experienced judge rather than a lay jury.[301] Allowing courts to make the apportionment decision allows precedent to be shaped where similar claims are apportioned in a similar manner.[302] Further, such determinations might integrate economic policy, including incentive theory, the needs of particular industries, and the economics of improvement.

Even if a contrary result is reached, the question remains whether apportionment is a question of law for the court or an issue of fact for the jury. From one perspective, the determination of the differences between the patented claim and the prior art represents an exercise in the legal interpretation of documents, at least one of which has the import of a government-issued right. In this sense, this determination has a number of functional similarities to contractual or statutory interpretation. Further, such a determination might be used to effectuate policies relating to technological areas or to create certainty through precedent that signals the types of claims that may be susceptible (or unsusceptible, as the case may be) to apportionment. In the final analysis, asking the court to apportion the claim is preferable for a number of functional and practical reasons.

CONCLUSION

The current patent statute governing reasonable royalty recovery, 35 U.S.C. § 284, requires apportionment. Its history and purpose support this reading. Moreover, implementing apportionment is consistent with the fundamental purpose of the patent system, as demonstrated by the economics of improvement. This construction will increase the accuracy of damage awards and the correct starting point for compensation for the patentee's injury.

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300 *See Markman*, 517 U.S. at 388 ("Where history and precedent provide no clear answers, functional considerations also play their part in the choice between judge and jury to define terms of art.").

301 *Id.* at 388-89 (identifying competence as one reason to treat an issue as legal).

302 *See* Cooper Indus., Inc. v. Leatherman Tool Grp., Inc., 532 U.S. 424, 440 (2001) (finding that the ability to compare judgments warrants treating punitive damage awards as legal).