Patent Claim Apportionment, Patentee Injury and Sequential Invention

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Reasonable royalty compensation for patent infringement is the most popular form of recovery and becomes more so every year. This may be based on the unfortunate but accurate perception that patentees can win big using the overly malleable legal standards that now govern such awards. One of the most glaring shortcomings of the standard is that it permits an award of a reasonable royalty based on doctrine that has lost touch with its statutory purpose.

This article sets forth a theory of patentee injury to establish a causative link between the inventive contribution and the reasonable royalty award. After doing so, this article concludes that apportionment is the correct starting point for compensating the patentee for the injury suffered from infringement. This work undertakes a detailed historical analysis of the current damages statute’s history to demonstrate that the intent of the current patent damages statute compels claim apportionment.

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In addition, implementing apportionment is necessary to effectuate the fundamental purpose of the patent system, which is to increase invention in the aggregate. Science is built on antecedents. Under current standards, incumbent patent holders who seek reasonable royalty awards for more than their contribution present a financial risk for subsequent creators who seek to push the boundaries of knowledge forward. Claim apportionment solves this problem awarding monetary relief solely on that portion of the infringed claim that represents the patentee’s contribution to the art at the time of invention. This result minimizes the burden on future inventors, is consistent with the purpose of the statute, and fully compensates those who have created patentable inventions in the past.

I) INTRODUCTION

A well-functioning patent system that fosters, and 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

¹ See generally, S. REP. No. 111-18, at 9 (2009) (noting that “commentators have correctly questioned whether juries are being properly advised on the evidence and factors to consider when determining damages.”); S. REP. 110-259, at 12 (2008) (noting that jurors “lack adequate legal guidance to assess the harm to the patent holder caused by patent infringement are the focus”); 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, Daralyn J. Durie and Mark 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, over-lapping, or even contradictory” that 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 “slough of despond”).

of the legal standards to derive the reasonable royalty have recently multiplied.\(^3\) Congress began to formulate solutions, but those efforts have largely collapsed due to an inability of various interested parties 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 innocent infringement. For example, in some instances, royalty rates exceed the infringing product’s selling price.\(^5\) Although a common justification for high damage awards is protection of the original inventor’s creation against copying, recent research demonstrates that copying may be quite rare, particularly outside the

3 See “The Patent Reform Act of 2009”, Hearing on H.R. 1260 Before the H. Comm. on the Judiciary, 111th Cong. 6 (2009) (statement of John R. Thomas, Professor of Law, Georgetown University) (noting that “[e]xcessive 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. . .”).


5 See i4i Ltd. v. Microsoft, 598 F.3d 831, 840 (Fed. Cir. 2010) (affirming a $98 award for an infringing product that sold for $97). Other Federal Circuit cases have affirmed that reasonable royalty awards may exceed the defendant’s expected or actual profit. 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, 1384 (Fed. Cir. 2004) (similar); Golight, Inc. v. Wal-Mart Stores, Inc., 355 F.3d 1327, 1338 (Fed. Cir. 2004)(upholding a reasonable royalty award that exceeded the infringer's profits).
pharmaceutical field. Furthermore, unlike an unimaginative copyist, the infringing entity may improve the initial invention and undertake the commercial risks to bring the invention to the market. Rather than creating a carefully balanced system between the rights of patent holders and subsequent improvers, the patent system has granted the biggest wins to non-practicing entities, who inexplicably obtain jury awards that average three times those of patentees who practice their inventions. Some method of tailoring is needed to better align the system toward its goals.

Apportionment is the correct starting point because it establishes the causal relationship between reasonable royalties and the patentee’s invention. Currently, this crucial step is missing. Reasonable royalty law never asks the gating question that requires the identification of the technology that is the subject of an award. Apportionment does so by requiring the definitional isolation of the patentee’s contribution to an art before the infringed claim is valued. By closing this gap, apportionment helps to reduce the random, and therefore troubling, disconnect between damage awards and the infringer’s use of the invention. Notably, the U.S. Court of Appeals for the Federal Circuit has explicitly rejected apportionment decades ago. The currently prevailing method used to calculate a reasonable royalty, called the Georgia Pacific test, includes consideration of the patentee’s contribution as one of a fifteen factor test, which are folded together in a manner that loses this crucial causative link in a malleable, and virtually unreviewable, verdict amount. Jury instructions do not ask the fact finder to identify the invention to be valued. Federal Circuit decisions frame the inquiry

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6 See Christopher A. Cotropia and Mark A. Lemley, Copying In Patent Law, 87 N.C. L. REV. 1421 (2009)(concluding that copying is established in less than 2% of all cases, and alleged in only 10%; more than half of these were outside the pharmaceutical sector). These authors suggest deterrence or unjust enrichment principles into 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 (2001).

7 PWC STUDY, supra note 2, at 7.

8 Fromson v. Western Litho Plate and Supply Co., 853 F.2d 1568, 1578 (Fed. Cir. 1988).

9 See Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (Factor 9, 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.”).

10 See, e.g., THE FEDERAL CIRCUIT BAR ASS’N MODEL PATENT JURY INSTR., NOS. 6.6 & 6.7 (2010 ed.); MODEL PATENT JURY INSTRUCTIONS FOR THE NORTHERN DISTRICT OF CALIFORNIA, NO. 5.7 (2007 ed.); THE NATIONAL JURY INSTRUCTION PROJECT, MODEL PATENT JURY
as providing the patentee with economic compensation for infringement of the “claimed invention”\textsuperscript{11} or “patented feature.”\textsuperscript{12} This suggests that compensation may erroneously be 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 are part of the public domain.

This paper proposes that apportionment be implemented by isolating the patentee’s contribution according to a method analogous to the 1966 \textit{Graham v. John Deere}.\textsuperscript{13} Specifically, the first \textit{Graham} step requires isolation of the inventive aspects of the infringed claim that examines “the scope and content of the prior art,” and identifies the “differences between the prior art and the claims at issue.” This step should ensure that the intellectual property of third parties, the public domain and the inventor’s prior art are excluded to avoid stacking values attributable to multiple inventive inputs.\textsuperscript{14}

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.\textsuperscript{15} A claim may be valid even if made entirely of elements that independently exist in the art.\textsuperscript{16} Under current peripheral claiming practice,

\begin{itemize}
  \item \textsuperscript{11} See ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010); Lucent Technologies, 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 \textit{infringed claim}”) (emphasis added).
  \item \textsuperscript{12} Lucent Technologies, Inc. v. Gateway, Inc., 580 F.3d 1301, 1331 (Fed. Cir. 2009).
  \item \textsuperscript{14} Stacking can occur where multiple inventive inputs are added together. See Mark A. Lemley & Carl Shapiro, \textit{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).
  \item \textsuperscript{15} See 35 U.S.C. § 101 (2001) defining patentable subject matter as including “any new and useful improvement” of a “process, machine, manufacture, or composition of matter”).
  \item \textsuperscript{16} See U.S. v. Adams, 383 U.S. 39, 51-52 (1966) (combination of elements that are well-known in the prior art are patentable).
\end{itemize}
claims are complete descriptions of an invention and commonly sweep in aspects of the prior art and knowledge that is existent at the time of invention. For example, a claim to an element of a computer system includes terms—such as “computer,” or “screen”—present in the art at the time of invention.\footnote{See, e.g., U.S. Patent No. 6,295,075 (filed Jul 10, 1997); ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860 (Fed. Cir. 2010).}

Other claims have more subtle, non-textual connections to the prior art. For example, a 1932 Kodak patent described and claimed color photography using sensitized film.\footnote{U.S. Patent No. 2,059,884 cl. 1 (filed Sep 21, 1932) (referring to “sensitized layers” and “sensitized film”).} This invention conceptually builds on George Eastman’s 1844 invention of a light sensitive black and white gelatinous film and, even further back, Niépce’s 1824 early monochromatic creation now considered to be the first photograph.\footnote{U.S. Patent No. 306,470 (filed May 10, 1884) (George Eastman’s patent for sensitive photographic film); see also BEAUMONT NEWHALL, THE HISTORY OF PHOTOGRAPHY, 15-17 (5th ed. 1982) (describing Niépce’s invention).} Similarly, the invention of the spiral-shaped compact fluorescent light bulb in the 1970’s, 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 1930’s.\footnote{This invention has been credited to an engineer named Edward Hammer. For some background, see \url{http://americanhistory.si.edu/lighting/20thcent/invent20.htm#in4} (last visited 3/13/11). Hammer’s employer, General Electric, decided not to patent Hammer’s bulb. A similar patent was granted to Thomas Guidice. \textit{See} U.S. Patent No. 3,953,761 (filed Apr. 3, 1974). Claim 1 of that patent reads:}

\begin{quote}
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 said ballast and surrounding said central ballast and being electrically connected to said ballast thereby to form a compact fluorescent light bulb assembly.
\end{quote}
that science is built on antecedents; every invention incorporates something that came before.\textsuperscript{21}

In each of these examples, the pre-existing knowledge was almost certainly in the public domain. To take the example one step further, assume a third generation inventor, unaware of 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.\textsuperscript{22} 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” bypasses the reality that all creative products build on a foundation of existing information.\textsuperscript{23} Typically, claims include a mix of the inventor’s contribution with the invention’s operative context that derives from third parties. Apportionment ensures that the patentee obtains compensation for harm from the use of the inventive contribution. Yet it also ensures that later users of the patented technology are not penalized by paying a royalty to the patentee that is based on technology developed by third parties. Properly

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implemented, it moves toward 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. The later, the step which considers the appropriate value attributable to an invention, is a separate inquiry. An invention which represents a significant advance in an art are expected to retain a high value. However, a claim that represents a more modest achievement should be expected to garner a close valuation to its worth.

II) DEFINING APPORTIONMENT

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 prior art and the claimed invention in the nonobviousness analysis. This approach requires an evaluation of the infringed claim’s advance over existing knowledge, separated from the claim as a whole. Once the claim’s contribution is isolated, it can be valued. This mechanism provides a solution to the compensation problem created for “clever claims”—that is, those claims in which a patentee has added exogenous elements to the claim to expand the royalty base. As an example, a software claim that adds a general purpose computer as a limitation at a time that general purpose computers are in the prior art would not entitle the patentee to include the computer in the royalty base. More broadly,


25 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) (quoting Grain Processing Corp. v. American Maize-Prosds. Co., 185 F.3d 1341, 1350 (Fed.Cir.1999)).

26 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 improvement claims may be encouraged to include additional components in combination claims to sweep additional products within their scope” to increase their total recovery).
apportionment eliminates overcompensation for nearly all claims that are extensions of preexisting 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. Alternatively, the claim elements that are novel can be isolated and valued. After doing so, the contributions by others that appear within these inventive elements would be valued and subtracted from the prior figured to derive the total value of the inventive contribution.

Apportionment is consonant with other areas of patent doctrine that rest on a claim’s point of novelty.27 Some examples of these include joint inventorship, which allows an individual to establish inventorship based on a contribution on one portion of an entire claim.28 Others are contributory infringement29 and exhaustion.30 As an emerging body of scholarly literature recognizes, patent law’s insistence on current peripheral claiming practices across the board can interfere with results that are consistent with patent policy.31 This is demonstrably true for reasonable royalty awards.


28 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).

29 35 U.S.C. § 271(c) (quote) (infringement can be based on sales or offers to sell “a material part of the invention”); Oxford Gene Technology Ltd. v. Mergen Ltd., 345 F. Supp. 2d 444, 466 (D. Del. 2004).

30 Quanta v. LG Electronics, 553 U.S. 617, 634 (2008) (exhaustion can be based on the sale of a product with all of the “essential features” of the patent).

This point is illustrated by using the facts of *Spine Solutions v. Medtronic Sofamor Danek*, in which the Federal Circuit considered claims to a spinal implant that relied on a single anchor point that allowed easier insertion and flexibility.\(^{32}\) All of the elements of the claim were disclosed in a prior art patent, except for a single element that described the single anchor limitation.\(^{33}\) A separate reference disclosed a single anchor used for an artificial vertebra.\(^{34}\) The inventor was not the first creator of the concept of spinal implants, or the first to use a single anchor in a spinal device. Rather, the inventor’s contribution was the combination of these individual elements in a particular implementation described in the patent. Compensation would not extend to the principle of the spinal implant, as that principle existed in the prior art. To do so goes beyond that needed for the injury suffered by the *Spine Solutions* patentee. The inventor, who combined a pre-existing single anchor and a pre-existing spinal implant, should instead be compensated for the inventive portion of the claim—that is, the advance that represents the combination of the two as described in the patent at issue. A patentee who obtains a royalty for more is overcompensated.

As another example, the claim at issue in *i4i v. Microsoft* was directed to an improved method for editing documents that contain text and markup languages.\(^{35}\) Generally, markup language characters are inserted around text as tags to tell a computer how the text should be processed, such as in bold or italics.\(^{36}\) The *i4i* patentee did not invent markup languages, or invent markup language editors; rather, the *i4i* patent claimed an improvement to an editor that stored the document’s content and tags separately.\(^{37}\) Notably, the preamble of an independent claim included the phrase 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.\(^{38}\) In this instance, the *i4i* reasonable royalty must be based

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\(^{33}\) *Id.* at 1311.

\(^{34}\) *Id.*


\(^{36}\) See generally, *i4i Ltd.*, 598 F.3d at 839-40.

\(^{37}\) *Id.*

\(^{38}\) U.S. Patent No. 5,787, 449, *supra* note 35, at cl.1
on the value of the improvement that relates to separate storage of the text and
tag, rather than an entire computer system, and to exclude aspects of the invention
that are in the prior art, such as the prior art use of software tags and mapping.

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. As one example, this may occur for inventions that represent a nuanced
but essential difference in molecular structure.39 If a patentee demonstrates that
circumstance, the claim must be valued as a whole.

This does not suggest that any art is excluded entirely from meaningful
evaluation of the patentee’s contribution. For example, some pharmaceutical
claims may be based on a modest change to an existing formulation.40 In such
cases, such claims may be the valid subject of an apportionment analysis.
Similarly, to the extent that the direction of the pharmaceutical industry is toward
multi-component end products, apportionment may play an important role in
ensuring appropriate compensation that does not obstruct the creation of advances
moving forward.


40 For an explanation of this practice, sometimes referred to as “evergreening,” see
COMM’N OF THE EUROPEAN COMMUNITIES, PHARMACEUTICAL SECTOR INQUIRY FINAL REPORT 15
(2009) (“The 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 generic exposure for the second generation product.”).
III) THEORIZING PATENTEE INJURY

a) Claim Scope and Monetary Recovery

Today, the term “invention” is strongly associated with the entire claim scope. As the widely invoked maxim states, “[i]t 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.” Under the prevailing practice of peripheral claiming, the words of the claim define the boundary of the patentee’s right. That is, the words of the claim describe the boundaries of the invention through the use of claim terms that set the “metes and bounds” of the patentee’s right to exclude. Implementations that fall within the claim’s scope are deemed infringing.

As a practical matter, claims frequently (and perhaps always) include information derived from pre-existing knowledge. As one example, a patentee’s claim may include both the inventive contribution and its operational context in order to meet the utility requirement. A frame of reference may be important to ensure that the contribution is sufficiently defined to meet the patentable subject


42 Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (citing cases and internal quotations omitted).

43 See e.g., id. at 1323 (referring to the relationship between the specification and the outer boundary of the claims); Intervet Inc. v. Merial Ltd., 617 F.3d 1282, 1287 (Fed. Cir. 2010) (claim limitations “define the outer boundaries of claim scope”); Ariad Pharmaceuticals, Inc. v. Eli Lilly and 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”).

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

matter requirement.\textsuperscript{46} It is difficult to isolate any example that does not build on that which came before.

Current reasonable royalty calculation standards overlook any separation between the patentee’s contributions from the technological context from which it arose. This may have led to the misperception that a reasonable royalty must match the claim scope. This result has never been compelled by the patent system. Even during the system’s earliest years, patentees were awarded monetary relief long before the existence of the claim requirement.\textsuperscript{47}

Several patent doctrines reveal that the term “invention” is distinct from claim scope.\textsuperscript{48} As one example, cases considering the written description requirement examine the relationship between the invention and the claim.\textsuperscript{49} By searching for a correspondence between them, this test implies that the inventor’s

\textsuperscript{46} 35 U.S.C. § 101; \textit{see generally}, Bilski v. Kappos, 130 S.Ct. 3218 (2010); \textit{cf.} Research Corp. Technologies, 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).

\textsuperscript{47} \textit{See} Joshua D. Sarnoff, \textit{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); Karl B. Lutz, \textit{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 efforts to include claims were “voluntary efforts”). 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, 1 Stat. 109-112 § 2 (April 10, 1790) (emphasis added). These same principles were carried forward in subsequent versions of the statute up until 1870. Patent Act of 1793, Ch. 11, 1 Stat. 318-323 § 3 (February 21, 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.”); and Patent Act of 1836, Ch. 357, 5 Stat. 117 § 6 (July 4, 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.”) (emphasis added).

\textsuperscript{48} \textit{See} In re Katz Interactive Call Processing Patent Litigation, 639 F.3d 1303, 1319 (Fed. Cir. 2011) (in assessing compliance with 35 U.S.C. § 112’s written description requirement, 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.”); Reiffin v. Microsoft Corp., 214 F.3d 1342, 1345-46 (Fed.Cir.2000) (same).

\textsuperscript{49} \textit{See} Ariad Pharmaceuticals, Inc., 598 F.3d 1336, 1247 (Fed. Cir. 2010) (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).
solution and the claim scope are separate concepts. As Oskar Liivak points out, the opposite conclusion signifies that the written description and claim requirements are redundant.

As another, the definiteness requirement examines whether the claim adequately conveys “the subject matter which the applicant regards as his invention.” 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. 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. As with the written description requirement, definiteness highlights that a real world invention is separate from the language of the corresponding claim.

Another is the doctrine of equivalents, which finds infringement where the implementation incorporates the “the benefit of the invention,” signifying that the invention is something that exists beyond the literal words of the claim. As the Supreme Court stated, the invention and the words describing it are not coterminous, stating “the nature of language makes it impossible to capture the essence of a thing in a patent application.” In doing so, the Court adopted the statement that “[a]n invention exists most importantly as a tangible structure or a series of drawings,”—that is, the inventor’s solution is later enshrined in a claim that is “usually an afterthought written to satisfy the requirements of patent

50 See also, Agilent Technologies, 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). Oskar Liivak reaches a similar conclusion with respect to the written description requirement in his analysis of the Ariad decision.

51 See Liivak, supra note 31, at 7-8.


54 See Research Corp. Technologies, Inc. v. Microsoft Corp., 627 F.3d 859, 869 (Fed. Cir. 2010).


law." Such language implicitly acknowledges that peripheral claiming 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. It has been reported that the practice developed in response to interpretative practices that determined infringement based on the claim. This development sought to increase certainty by providing a definitional focal point, rather than as a fundamental shift in the nature, scope or strength of the patent right. 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. 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. 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 that suffered from the wrongful conduct. Although patent cases occasionally refer to the doctrine of

57 Id. (citing Autogiro Co. v. U.S., 384 F.2d 391, 397 (1967)).


59 See id. at 1143.

60 Wordtech Systems, Inc v. Integrated Networks Solutions, Inc., 609 F.3d 1308, 1313 (Fed. Cir. 2010).
proximate cause, a theoretical foundation of the patentee’s injury appears to have either gotten lost or has never existed.

Some foundational principles are a useful starting point to analyzing patentee injury. First, a reasonable royalty is a compensatory remedy.61 There are two ways that a patentee may be harmed by infringement. First, a patentee may suffer harm to a market that relates to the patented invention. Although lost profits are thought to compensate for harm to a market, a reasonable royalty can be used to substitute for, or to augment, that form of relief.62 In that instance, the patentee’s market harm is compensable subject to the limits of proximate cause. Recovery for harm to the patentee’s market for sales of a patented product is supported by proof of the loss—for example, a patentee obtains a royalty based on competing sales even if the patentee cannot demonstrate lost profits.

Second, a patentee can obtain a reasonable royalty for use of the invention in the absence of any pecuniary loss. Thus, a patent plaintiff need not show any pecuniary loss, market impairment or lost investment revenue. Patent law presumes that infringement leads to, at a minimum, an injury from the invention’s use as the violation of the patent right.63 This is true for both patentees who have built a business around patented technology, as well as for those who have no intent to exploit the patent or operate in the any market. One might 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 non-practicing entities.64 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.

61 35 U.S.C. § 284; 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.”) (citing cases).

62 For a discussion of lost profits and reasonable royalty, see Mark A. Lemley, Distinguishing Lost Profits From Reasonable Royalties, 51 WM. & MARY L.R. 655 (2009).

63 See generally, Stephen Perry, Harm, History and Counterfactuals, 40 SAN. DIEGO. L. REV. 1283, 1292 (2003) (defining legal injury as the violation of a right).

64 PWC STUDY, supra note 2, at 7 (damage awards for non-practicing entities are triple the amount for practicing entities) (last visited 3/1/11).
Apportionment does not affect any of these principles, and takes as a given the patent system’s present standing requirements. Rather, apportionment sets the starting point for determining the patentee’s injury by defining that which is to be valued. The answer to this question is difficult for intangibles. Outside patent law, many causes of action have an identifiable, and sometimes physical, 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. By comparison, Georgia Pacific does not require that the patentee demonstrate cause in fact. The line drawing that seems intuitive for other private remedies are lost behind patent law’s assumption that use of the invention is a compensable injury. Beyond that point, patentee injury is 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 later leading to a legally recognizable injury. The difference between them rests on the application of law. The former is a real world impact, including from conduct that is not wrongful. The latter is compensable due to the operation of law. In the patent context, another who designs around a claim harms the inventor who pioneers a new market based on a novel invention. Yet such harm is not considered an injury because the law provides that compensation is not due in the absence of infringement. As an additional distinction, injuries must fall within the scope of the interest protected by law. Furthermore, foreseeability alone cannot transform harm into injury. Therefore, although it is foreseeable that a product that is made by designing

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65 See Christina Bohannan and Herbert Hovenkamp, *IP and Antitrust: Reformation And Harm*, 51 B.C. L. REV. 905, 915 (2010) (proposing “IP injury” to effectuate invention and innovation, in the manner similar to the doctrine of the injury requirement of antitrust law) Unlike apportionment, these authors propose that “requires compensation only where the defendant's use harms the IP holder's ex ante incentives to innovate.” *Id.* at 988; see also Roger D. Blair and Thomas F. Cotter, *Rethinking Patent Damages*, 10 TEX. INTELL. PROP. L.J. 1, 74 (2001) (discussing a patent injury requirement for lost profits claims).


around a claim may harm the patentee who pioneered a market, no injury has occurred because no claim has been infringed. To take the analysis one step further, it is foreseeable that a patentee may suffer harm from infringement of an entire claim. The extent to which a patentee is injured is a separate question.

Certainly, intellectual property has attributes that complicate direct analogies to other areas of law.\(^6^9\) Yet Arthur Ripstein, who discusses theories of injury for tort law, provides an insight that is helpful to understand the nature of patentee injury.\(^7^0\) He argues that compensable injuries are entitlements that provide one the means to accomplish one’s intention.\(^7^1\) 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” a compensable injury.\(^7^2\) Viewing private law through this lens, Ripstein takes a broad view by arguing that compensation should be awarded for the unauthorized use of anything that belongs to the plaintiff that might be used to accomplish the patentee’s aims. 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.”\(^7^3\) He observes that a plaintiff is denied recovery for losses traceable to the destruction of a bridge used by customers to reach the plaintiff’s business, where another owns the damaged bridge.\(^7^4\) Recognizing that compensation is not warranted for harm to that which the plaintiff does not exercise legal control, he explains that


\(^7^0\) Ripstein, *supra* note 65.

\(^7^1\) *Id.* at 1966-67 (2006).

\(^7^2\) *Id.* at 1967.

\(^7^3\) *Id.* at 1977.

\(^7^4\) *Id.*
such examples “illustrate the sense in which someone can use something without it being at that person's disposal.”

This perception illuminates a principle useful for patent law—that is, nearly all claims incorporate non-inventive material from the prior art. Whether expressly or implicitly, this does not create inventorship, ownership or legal control of the third party’s contribution. 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 $B$, 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 tort concepts of injury prevent a plaintiff from recovery for harm to another’s property, a patentee cannot claim an injury to something he did not invent. 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.”

An alternative framework opens another line of inquiry—specifically, 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. His account identifies first order harms as core, such as the protection against bodily harm. Second order interests are legally cognizable only where another interest is being served. Applying this outline to the problem at hand, one might consider infringement of the inventor’s contribution a first order harm. Compensation for

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75 Id. 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 the ability to control activities of the other. Id. at 1977-98. 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.


77 Perry, supra note 62, at 1304.

78 Id.

79 Id. at 1308; see also, John C.P. Goldberg, Rethinking Injury and Proximate Cause, 40 SAN DIEGO L. REV. 1315, 1325-26 (2003) (describing interference with second order interests as compensable when doing so serves pragmatic or utilitarian ends).
the invention developed by another is, if anything, a secondary harm that cannot support compensation unless a valid justification exists.

One potential justification draws from a developing literature that considers monetary evaluation in light of patent law’s incentive scheme.\textsuperscript{80} Yet incentives, by themselves, do not require compensation for more than has been invented. Further, creating a damages scheme based on the entire claim scope may provide incentives for broad claiming, rather than invention. Moreover, this literature does not appear to advocate a theory of patentee compensation for more than the inventor actually created.\textsuperscript{81} There may be reasons to adjust the valuation inquiry based on an incentive rationale, but distorting the identification of the inventive aspect of the claim seems an unwieldy and disconnected way to reach those ends.

Another justification for awarding more than a patentee’s injury may be that other goals, such as deterrence, must be met. As Richard Epstein describes, an ideal property-based patent system incorporates remedies that include “an additional deterrent against future infringement.”\textsuperscript{82} Then, a correct measure of damages may viewed as a matter of optimal deterrence—that is, damages that are intended to create appropriate incentives for actors to undertake socially beneficial conduct.\textsuperscript{83} As an initial matter, there are several important reasons to question whether deterrence is an appropriate goal for the reasonable royalty analysis.\textsuperscript{84} Specifically, direct infringement does not require foreseeability or

\footnotesize{\textsuperscript{80} Einer Elhauge, \textit{Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties}, 4 J. COMPELITION L. & ECON. 535 (2008); Golden, \textit{supra} note 1, at 531 (considering the impact of patent value on research incentives, among other incentives).}

\footnotesize{\textsuperscript{81} Cf. Elhauge, \textit{supra} note 80 at 541-42 (discussing incentives to invent); Golden, \textit{supra} note 1 at 531 (same).}


\footnotesize{\textsuperscript{83} See generally, A. Mitchell Polinsky and Steven Shavell, \textit{Punitive Damages: An Economic Analysis}, 111 HARV. L. REV. 869 (1998) (discussing optimal deterrence for liability in tort law). As applied to law, optimal deterrence theory holds that a rational actor will the magnitude of the penalty and the probability of being detected against the gain from the violation. \textit{See generally}, Marice E. Stucke, \textit{Morality and Antitrust}, 2006 COLUM. B. L. REV. 443, 448 (discussing optimal deterrence theory).}

\footnotesize{\textsuperscript{84} A comprehensive analysis of this issue is in Brian J. Love, \textit{The Misuse Of Reasonable Royalty Damages as a Patent Infringement Deterrent}, 74 Mo. L. REV. 909 (2009). See also,
knowledge; rather, it is akin to strict liability. Building deterrence goals into every liability finding is theoretically inconsistent with the infringement standard, which assumes that the defendant is liable regardless of whether there is any reason to know of the possibility of wrongdoing or any reason to act differently.\footnote{As described during a discussion of the deterrence function of strict liability law, Joseph H. King, Jr., \textit{A Goals–Oriented Approach to Strict Tort Liability for Abnormally Dangerous Activities}, 48 \textit{Baylor L. Rev.} 341, 353-54 (1996), explains, “[o]n 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.”}

Further, research suggests that most infringement scenarios are not based on copying, particularly outside the pharmaceutical field where they appear to be quite rare.\footnote{See Cotropia and Lemley, \textit{supra} note 6.}

Beyond this, there is little reason to suppose that awarding a reasonable royalty based on the full claim scope is equal to the level of optimal deterrence. This is because 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. Litigation attorneys have some incentive to assert the narrowest valid claim against infringers, to minimize the number of elements that must be proven to demonstrate infringement. Neither of these concerns even remotely meshes with optimal deterrence theory, which emphasizes the infringer’s motivation. If deterrence is to be incorporated into the reasonable royalty inquiry, that concept is better considered in a more nuanced way rather than awarding all patentees damages for the full claim scope in every case.

An alternative justification may be that compensation should be awarded in any case where there is a likelihood of under-enforcement or under-compensation.\footnote{\textit{Id.}, at 887-890 (discussing these issues with respect to tort law).} Theoretically, these circumstances may occur where infringement is difficult to detect, or a reason to believe that the patentee’s harm includes elements that is either not be susceptible to proof or recompense. Many of the same arguments that consider deterrence are applicable here. Perhaps most significantly, apportionment represents the identification of the contribution to be

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Polinsky & Shavell, \textit{supra} note 82 (tort law, discussing that compensatory damages should equal the plaintiff’s harm and that deterrence should be accomplished using punitive damages).
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valued, rather than an assessment of the advance’s worth. The peripheral boundaries of the claim are an illogical place to fix any perceived inadequacies of the patent damage calculation.

IV) THE CURRENT PATENT ACT REQUIRES APPORTIONMENT

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. 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.  

At the start of the U.S. patent system, 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. 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. Over the years, the concept of a trust was replaced with the view that monetary awards in equity were compensatory in nature, and an efficient method to grant the patentee an award without resorting to a separate action in the courts of law. As this compensatory purpose became established, a reasonable royalty emerged as a method to provide compensation to patentees who would otherwise be denied all damages for the failure to establish an entitlement to all of the defendant’s profits under the entire market value rule. 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. 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.

88 For an overview, see Eric E. Bensen, Apportionment of Lost Profits in Contemporary Damages Cases, 10 VA. J. L. & TECH. 8 (2005).

89 Washington, Alexandria & Georgetown Steam Packet Co. v. Sickles, 86 U.S. 611, 618 (1873)(stating, “[t]he rule in suits in equity. . . is that of converting the infringer into a trustee for the patentee as regards the profits thus made”).

90 See generally U.S. Frumentum Co. v. Lauhoff, 216 F. 610 (6th Cir. 1914).

This recognition vaguely persists in today's reasonable royalty, though it appears to have been lost among the multi-factor Georgia Pacific test, which “overloads the jury with factors to consider that may be irrelevant, overlapping, or even contradictory.” 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.” There are two integrated terms that warrant examination. First, the word “invention” was added to the patent damages at a time when that term referred to whether a claim was sufficiently separable from the prior art to render the claim nonobvious. Second, the term “reasonable royalty” was added to the statute at a time when the courts examined the patentee's contribution to the prior art. Together, the phrase “reasonable royalty for the use made of the invention” in the current version of the Patent Act integrates both of the concepts, and therefore requires the identification of the inventive contribution before valuation for a reasonable royalty is performed.

According to one critic of apportionment, isolating the inventive contribution 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 determine the market value of the patented invention and, in turn, appropriate compensation. This assertion is both historically and factually inaccurate. As originally envisioned, the reasonable royalty inquiry was preceded by an identification of the patentee’s actual contribution to the subject art. 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. As currently configured, 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

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92 Durie and Lemley, supra note 1 at 628.


95 See Section V(b)(3)(iii) infra.
factors must be applied to accomplish the statute’s purpose. 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. This requirement took hold after the landmark 1850 *Hotchkiss v. Greenwood*, the first Supreme Court opinion to find a patent “destitute of ingenuity or invention,” and lacking more ingenuity or skill “possessed by an ordinary mechanic acquainted with the business.”

This “invention requirement” was renamed in 1952 after a long period of the doctrine’s inconsistent application, which led to uncertainty and an overall weakening of the patent right. 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.”

The term became particularly unworkable after the Supreme Court’s 1946 *Cuno Engineering v. Automatic Devices*, 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.” In 1952, this trend was

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96 See *Georgia-Pacific 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.”).

97 See, e.g., *Great Atlantic & 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 Chemical Co. v. Halliburton Oil Well Cementing Co.*, 324 U.S. 320, 327 (1945) (holding that the claimed process was a mere extension of existing knowledge and therefore “lacks the very essence of an invention”).


99 See Giles S. Rich, *The Vague Concept of “Invention” as Replaced by §103 of the 1952 Patent Act*, 14 FED. CIRCUIT B.J. 147, 157 (2004) (noting that the word “invention” was “in fact, carefully avoided with a view to making a fresh start, free of all the divergent court opinions about “invention.”).


101 *Cuno Engineering Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 91 (1941).
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.’”

Before that addition, the term “invention” was added to the remedies
portion of the Patent Act when the term was still widely understood to refer to
that which was not obvious. 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. Dovetailing with this principle, the
historical background to the addition of the phrase “reasonable royalty” as
enacted demonstrates that the current patent damages statute compels
apportionment of the patentee’s contribution.

b) The Historical Development of the Reasonable Royalty

It has been suggested that apportionment would “transform patent rights
into something far different, and far less valuable, than the nation’s founders
intended.” Another has expressed concern that narrowing the focus of the


103 35 U.S.C. § 70 (1946 ed.) (“a 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 during the 1952 amendment of 35 U.S.C., as a signal to
the judiciary to avoid the subjectivity and vagueness that had plagued the invention requirement.
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 101, 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.

2394, 2403).

the Judiciary, 111th Cong. 9 (2009) (statement of Bernard J. Cassidy, Senior Vice President and
General Counsel, Tessera).
reasonable royalty is “designed to deprive patent owners of the true economic value of their patents.” 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, in fact, the case.

As background, the Patent Act has always permitted patentees to recover monetary relief for infringement. The initial statutes provided for recovery at law. In 1870, the Patent Act was amended to adopt the then-existing court

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107 See Patent Act of 1790, Ch. 7, sec. 4, 1 Stat. 109-112 (April 10, 1790) (an infringer “shall forfeit and pay to the said patentee... such damages as shall be assessed by a jury...”); Patent Act of 1793, Ch. 11, section 5, 1 Stat. 318-323 (February 21, 1793) (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 1836, Ch. 357, section 14, 5 Stat. 117 (July 4, 1836) (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 1870, Ch. 230, section 55, 16 Stat. 198-217 (July 8, 1870) (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 1897, Ch. 391, section 6, 29 Stat. 692-694 (March 3, 1897) (same, amending Revised Statute 4921); Patent Act of 1922, Ch. 58, sec. 8, 42 Stat. 392 (Feb. 18, 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”).

practice of awarding monetary relief in equity.\footnote{109} Prior to the merger of law and equity in 1938, patentees elected between them.\footnote{110}

Another significant thread running throughout both law and equity cases relates to calculating damages for inventions that contributed only a portion of the value of an infringing device.\footnote{111} These cases examined the question of whether the patentee may recover the defendant’s entire profits, or in the alternative only a portion according to the invention’s contribution. For example, in the 1853 \textit{Seymour v. McCormick}, the Court refused to allow damages on an entire infringing reaping machine where the invention at issue covered only an improvement to the seat.\footnote{112} However, other cases reached the opposite conclusion applying a doctrine that developed into the entire market value rule.\footnote{113} For example, 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.\footnote{114} These cases illustrated a tension between awarding a patentee compensation based on the patent’s application to the infringing product.

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\footnote{109} Patent Act of 1870, Ch. 230, section 55, 16 Stat. 198-217 (July 8, 1870). During the first twenty years of the patent system, infringement actions were determined at law. Lutz, \textit{supra} note 47, at 143. Over time, courts sitting in equity began deciding infringement actions. \textit{Id}. Notably, courts sitting in equity awarded the patentee the infringer’s profits well before statutory authorization to do so was incorporated into the Act. See, \textit{e.g.}, \textit{Dean v. Mason}, 61 U.S. 198 (1857).

\footnote{110} See generally, \textit{Birdsall v. Coolidge}, 93 U.S. 64, 68 (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 \textit{Gordon Form Lathe v. Ford Motor Co.}, 133 F.2d 487, 490 (6th Cir. 1943)(patentee was entitled to an election between the defendant’s profits or damages). According to the rules of equity, disgorgement was available only where infringement was ongoing. \textit{Brown v. Lanyon}, 148 F. 838, 842 (8th Cir. 1906).

\footnote{111} \textit{Garretson v. Clark}, 111 U.S. 120 (1884) (action in equity); \textit{Seymour v. McCormick}, 57 U.S. 480 (1853) (action for damages at law).

\footnote{112} \textit{Seymour v. Morgan}, 57 U.S. 480, 489 (1853) (claim to portion of a reaper could not support damages based on sales of the entire machine, 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”).

\footnote{113} For a description of the modern entire market value rule, see \textit{Lucent Technologies, Inc. v. Gateway, Inc.}, 580 F.3d 1301, 1338-39 (Fed. Cir. 2009); \textit{Landers, supra} note 26, at 42-51; \textit{Brian J. Love, Patente Overcompensation And The Entire Market Value Rule, 60 STAN. L. REV. 263} (2007).

\footnote{114} \textit{City of Elizabeth v. American Nicholson Pavement Co.}, 97 U.S. 126, 142 (1877).
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During the years, the courts also developed the foundation for apportionment as a means to examine the aspects of the patented invention that warrant compensation.

**i) Monetary Recovery in Equitable Actions**

Prior to the merger of law and equity, a patentee seeking injunctive relief brought an action in equity. In that forum, monetary damages were considered merely incidental relief. Very early equitable cases limited a patentee’s monetary recovery to the infringer’s profits. 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 and then calculated the award. In the earliest years, this type of recovery had very little flexibility. These awards were viewed as disgorgement of the infringer’s profits. Damage to the plaintiff was considered beyond the jurisdictional reach of the courts, as one court explained, “[w]e are aware of no rule which converts a court of equity into an instrument for the punishment of simple torts.” More precisely, a court awarding the patentee the defendant’s profits exercised 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.

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116 See Root v. Railway Co., 105 U.S. 189, 214 (1881) (reviewing cases, concluding “[i]t is true it is declared in those cases that, in suits in equity . . . is entitled to account of the profits realized by the infringer. . . .”).


118 Livingston v. Woodworth, 56 U.S. 546 (1853) (only the infringer’s actual gains could be calculated and awarded, equity did not provide any authority to impose a monetary penalty).

119 See General Motors Corp. v. Devex Corp., 461 U.S. 648, 658 (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.”).

120 Id. at 559.

121 Id., see also, Providence Rubber Co. v. Goodyear, 76 U.S. 788, 804 (1869) (“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.”).
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.122

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.123 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.124 During this time, disgorgement of the defendant’s profits remained the preferred measure.125 Those unable to demonstrate the infringer’s profits (or a cost savings that resulted in profits) could not recover a reasonable royalty.126 Further, the infringer’s liability was limited by the actual, rather than anticipated, profits.127

122 Livingston, 56 U.S. at 549 (stating “[i]f the [patentees] had sustained an injury to their legal rights, the courts of law were open to them for redress.”).

123 See Patent Act of 1870, Ch. 230, section 55, 16 Stat. 198-217 (July 8, 1870) (“the 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”) (emphasis added). This language was repeated in the 1922 version of the Patent Act. See 35 U.S.C. § 70 (1922).

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

125 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 . . .”)

126 See Keystone Mfg. Co. v. Adams, 151 U.S. 139 (1894) (no recovery where patentee failed to demonstrate the infringer’s profit; evidence of profits of other manufacturers was not sufficient). Black v. Thorne 111 U.S. 122 (1884); City of Elizabeth v. American Nicholson Pavement Co., 97 U.S. 126, 138 (1877) (cost savings that contributed to the infringer’s general profitability are recoverable in equity).

127 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 . . .”); City of Elizabeth, 97 U.S. at 138 (“if 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.”).
At about this same time, courts began to view monetary awards in equity as compensatory in nature, rather than as the imposition of a constructive trust. For example, the 1871 Supreme Court *Mowry v. Whitney*, observed:

> The profits that 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...  

This shift away from the constructive trust theory of equitable monetary relief was reinforced in the 1881 *Root v. Railway Co.* 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.

### ii) 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. The first, enacted in 1790, stated that the patentee was entitled to “such damages as shall be assessed by a jury.” The 1793 Act specifically keyed damages to the amount that the patentee “has usually sold or licensed to other persons.” In 1836, the Act reverted to the more general term “damages.” The preferred method of calculating damages in actions at law was the patentee’s established licensing...

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130 *Id.* at 214.

131 *See*, authorities cited in *supra*, note 107.


133 Patent Act of 1793, Ch. 11, section 5, 1 Stat. 318-323 (February 21, 1793).

rate. Where a patentee did not license the patent, but chose to exercise control over the invention by market exclusivity, the infringer’s profits were used as the measure of the plaintiff’s recovery.

iii) 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, the Court required evidence of an established licensing rate or actual harm to the market to recover anything more than nominal damages. For example, in the 1895 Coupe v. Royer, 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 disclosing 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.” Some of the lower courts interpreted Coupe to prevent damages in the form of a reasonable royalty, and that general

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135 See id. at 69-70 (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); 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.”); see also, Rude v. Wescott, 130 U.S. 152, 165 (1889) (defining an established royalty); Packet Co. v. Sickles, 86 U.S. 611, 617 (1873) (established license fee was the proper measure of damages). Burdell v. Denig, 92 U.S. 716, 720 (1875) (stating the legal court’s preference for awarding damages based on an established license rate). Lost profits did not become common until after the turn of the twentieth century. See Oil Well Improvements Co. v. Acme Foundry & Machine Co., 31 F.2d 898 (Fed. Cir. 1929) (allowing lost profits as a form of recovery).

136 Seymour v. McCormick, 57 U.S. 480, 489 (1853) (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 v. Denig, 92 U.S. 716, 720 (1875) (stating that the infringer’s profits can be considered general evidence of a patentee’s harm in the absence of an established royalty)(dicta).

137 See Coupe v. Royer, 155 U.S. 565, 583 (1895); Rude, 130 U.S. at 166-67.

138 Coupe, 155 U.S. at 583.
evidence of an invention’s value was barred in favor of an award limited to nominal damages.\(^{139}\)

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.\(^{140}\) Significantly, in the 1865 *Suffolk v. Hayden* 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.\(^{141}\)

In the 1915 *Dowagiac Manufacturing v. Minnesota Moline Plow*, the Supreme Court decided a case in equity that resolved any discrepancy between *Coupe* and *Suffolk*.\(^{142}\) 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.\(^{143}\) 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 used to plant called a grain drill, and 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.”\(^{144}\) Rejecting that the entire

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\(^{139}\) See, e.g., Brown v. Lanyon, 148 F. 838 (8th Cir. 1906) (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 (1st Cir. 1898) (rejecting proof of the value of the invention, limiting the plaintiff to nominal damages); Houston, E. & W.T. Ry. Co. v. Stern, 74 F. 636 (5th Cir. 1896). See also, Whitttemore v. Cutter, 29 F.Cas. 1123 (1813) (in the absence of pecuniary loss, only nominal damages should be awarded).

\(^{140}\) See, e.g., U.S. Frumentum Co. v. Lauhoff, 216 Fed. 610, 616-17 (6th Cir. 1914); Hunt Bros. Fruit-Packing Co. v. Cassiday, 64 F. 585 (9th Cir. 1894).

\(^{141}\) Suffolk Co. v. Hayden, 70 U.S. 315 (1865); see also Brickill v. City of Baltimore, 60 F. 98 (4th Cir. 1894). This conflict in the case law surrounding the reasonable royalty is detailed in Erick S. Lee, *Historical Perspectives on Reasonable Royalty Patent Damages and Current Congressional Efforts for Reform*, 13 UCLA J.L. & TECH. 1 (2009).


\(^{143}\) 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 (9th Cir. 1896), an action at law which affirmed a damages award based on a reasonable royalty to calculate the value of the patentee’s loss.

\(^{144}\) Dowagiac, 235 U.S. at 644-45.
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.”\(^{145}\) Placing the burden of apportionment on the patentee, the Courts stated, “[i]n 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.”\(^{146}\) As no lost profits or established royalty had been shown, *Dowagiac* remanded the case to enable the patentee to demonstrate “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.”\(^{147}\) 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. One very early decision, *Mowrey v. Whitney*, examined the amount of profits to be awarded to the patentee Whitney for infringement of claim for a multi-step process for making a wheel.\(^{148}\) The claim’s inventive aspect was in the final step, which increased durability of the final product.\(^{149}\) 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

\(^{145}\) Id. at 647.

\(^{146}\) Id. at 646.

\(^{147}\) Id. at 648.

\(^{148}\) Mowrey v. Whitney, 81 U.S. 620 (1871).

\(^{149}\) Id. at 637.
that advantage are his profits. They are all the benefits he derived from the existence of the Whitney invention.\(^{150}\)

Another pre-Dowagiac case, Dunn Mfg. v. Standard Computing Scale, 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 was included both inventive and public domain features.\(^{151}\) Other cases pre-dating Dowagiac reflect this same principle.\(^{152}\)

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, the Sixth Circuit’s 1928 Egry Register Co. v. Standard Register Co. found the district court had erred in awarding the patentee an amount of the infringer’s entire profit, stating:

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

\(^{150}\) Id. at 651

\(^{151}\) Dunn Mfg. v. Standard Computing Scale Co., 204 F. 617, 619 (6th Cir. 1913) (observing that “the 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 Mfg. 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.

\(^{152}\) 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. American Car & F’dry Co., 212 F. 742, 751 (D.N.J. 1914) (“the owner of the patent in seeking only to recover profits from an infringer of the combination is limited to the excess of profits 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 (3rd Cir. 1915); McCreary v. Pennsylvania Canal Co., 141 U.S. 459, 462 (1891).

In *Horvath v. McCord Radiator*, 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. 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.

These cases implemented the reasonable royalty with the recognition that the patent’s contribution should be isolated before a reasonable royalty valuation is performed. This standard was applied with cognizance that relief should be awarded based on “what plaintiff’s patent property was,” together with other evidence akin to that used in today’s *Georgia Pacific* test. In 1922, the Patent Act was amended to authorize courts to award “a reasonable sum as profits or

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154 *Horvath v. McCord Radiator*, 100 F.2d 326 (6th Cir. 1938).

155 *Id.* at 330.

156 The damages rules previously described 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 generally*, Crosby Valve Co. v. Safety Valve Co., 141 U.S. 441, 448 (1891); Wales v. Waterbury Mfg. Co., 101 F. 126, 127 (2nd 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 particularly adapted for the purpose” implemented into the infringing devices).

157 U.S. Frumentum Co. v. Lauhoff, 216 F. 610, 617 (6th Cir. 1914) (these other factors include 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 it 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 Indust., 101 F.2d 257, 261 (6th Cir. 1939); Merrell Soule Co. v. Powdered Milk Co., 7 F.2d 297, 300 (2nd Cir. 1925); *Horvath v. McCord Radiator & Mfg. Co.*, 100 F.2d 326, 335 (6th Cir. 1938).
general damages for the infringement.”¹⁵⁸ 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.¹⁵⁹ This demonstrates the judicial understanding that apportionment was an established doctrine underlying monetary remedies for patent infringement.

Notably, the Dowagiac reasonable royalty represented a retreat from an earlier decision, Westinghouse v. Wagner Electric, which was perceived as delivering very harsh consequences for infringers.¹⁶⁰ Specifically, Westinghouse considered the applicable rule of determining the defendant’s profits where the infringed claim represented only a portion of the infringing product.¹⁶¹ To answer this question, Westinghouse held that the infringer bore the burden of apportionment, and where such allocation was impossible the infringer owed the patentee the entire profit.¹⁶² 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.”¹⁶³ Significantly, the Dowagiac decision did not expressly over-rule Westinghouse. That reversal did not occur until the damages statute was amended in 1946.

¹⁵⁸ Act of Feb. 21, 1922, ch. 58, 42 Stat. 392, § 8 (providing for the award of a “reasonable sum” as profits or general damages for the infringement); see also 35 U.S.C. § 284 (2001).

¹⁵⁹ 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 Securities Co. v. De Vilbiss Mfg. Co., 76 F.2d 503, 504 (6th Cir. 1935) (“the invention is to be measured, not by the language of the claims, but by the advance over the prior art”).


¹⁶¹ Id. at 615.

¹⁶² Id. at 620.

¹⁶³ Id.
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.” These 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 profits.” Perhaps not surprisingly, Dowagiac and the reasonable royalty was not the contentious issue in the hearing transcripts. This may be due to the fact that Dowagiac had become woven into the fabric of the Patent Act in 1922.

Ultimately, the 1946 amendment to the Patent Act eliminated disgorgement of profits, rendering Westinghouse’s harsh damages rules moot. 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.” This was carried forward into the current version of the Patent Act without substantive change. This history demonstrates that Dowagiac’s conception of a the reasonable royalty became a feature of the current Patent Act, although Westinghouse did not. 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


165 Id.; see also, id. at 8 (testimony of Condor C. Henry, Assistant Commissioner of Patents, describing Westinghouse as problematic and Dowagiac’s subsequent reasonable royalty holding). This statement was endorsed by the then-current Chairman of the Committee on Legislation for the American Bar Association. Id. at 14-15.

166 See General 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”).


168 See General Motors, 461 U.S. at 652 n.6.

169 See also, H. 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.”).
cannot be said that requiring a correlation between the patentee’s contribution and the reasonable royalty for its use would “transform patent rights into something far different, and far less valuable, than the nation’s founders intended.”

Current case law frames the reasonable royalty as a way to provide the patentee with economic compensation for infringement of the “claimed invention” or “patented feature” 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, 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.

V) APPORTIONMENT AND THE ECONOMICS OF IMPROVEMENT

Intellectual property law is concerned with the question of knowledge creation in the aggregate. Innovators commercialize, build on, or accelerate, their own new developments based on the work of prior inventors. As Robert Merges and Richard Nelson discuss, “multiple and competitive sources of


171 See ResQNet.com, Inc. v. Lansa, Inc., 594 F.3d 860, 869 (Fed. Cir. 2010); Lucent Technologies, 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).


173 See Georgia-Pac. Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) (Factor 9, 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.”).


175 Id. at 127 (describing cumulative invention scenarios); see also, Roger D. Blair and Thomas F. Cotter, Rethinking Patent Damages, 10 TEX. INTELL. PROP. L.J. 1, 46 (2001) (recognizing that one of the costs of an intellectual property system is that it “raise(s) the cost of creating follow-up innovations based upon a pioneering invention.”)
invention are socially preferable to a structure where there is only one or a few sources.”

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. Pointing out that the efficient creation of new works necessarily add 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. As he explains, intellectual property limits this access and, coupled with notice problems and transaction costs, imposes costs on later improvers that they would not incur in the absence of these rights. 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.”

Achieving a workable patent system requires a balance between preserving incentives for the initial inventor while minimizing the detrimental impact to subsequent improvers. For the first part, 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 system. Other writings discuss that the patent system’s incentive structure is not currently optimally implemented and, to the extent that it exists, is context dependent and

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177 Lemley, *supra* note 23.

178 *Id.* at 997.

179 *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 (2000).


perhaps industry-specific. One scholar has questioned whether the question of optimal incentives can be answered at all. Apportionment is intended to create a closer association between the claim’s actual value and the monetary award. Presenting a jury with an entire claim for a reasonable royalty valuation induces the misperception that damages must include value for contributions patented by third parties or from the public domain.

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 in a manner that 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. Patents are not publicly traded, and information about private patent transactions typically remains so, making market correction unlikely. Setting a patent’s value to deviate from the market to increase incentives should not be undertaken lightly, without considering alternatives such as direct research funding.

For the second part, the economics of improvement counsel that the total amount of invention is an integral goal of the patent system. Earlier patents have the potential to bar subsequent developments for those who later seek to push an

183 The literature analyzing patents as an incentive system is too numerous 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); 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, including JAMES BESSEN AND MICHAEL J. MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2009); DAN L. BURK AND MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT (2009); and ADAM B. JAFFE AND JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT (2004).

184 Paul J. Heald, Optimal Remedies for Patent Infringement: A Transactional Model, 45 HOUS. L. REV. 1165, 1173 (2008) (stating, “no one has any idea how to calculate the optimal amount of R&D a firm should conduct.”).

art forward. Subsequent innovators play a critical role in knowledge creation, and have an incentive to develop alternatives and variations that an initial inventor does not. 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.”

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. 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. 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 is 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

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188 Merges & Nelson, supra note 174 at 873.


190 Merges & Nelson, supra note 174 at 908 (noting the “Public policy, including patent law, ought to encourage inventive rivalry, and not hinder it.”); Cotter, supra note 94 at 1169 (“enabling 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.”).
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 the economics of improvement.\footnote{191} 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. 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.

The counterargument is that incumbents should be favored, based on the assertion that patents will be devalued, with an accompanying negative impact on research and investment.\footnote{192} This view considers that if patents are not properly valued, infringers have incentives to infringe and inventors will lack incentives to create.\footnote{193} To clear some portion of this debate, it is well to recall that many patent infringement disputes arise from instances of independent invention.\footnote{194}

Concerning the impact of apportionment on research and development, one study performed by Scott Shane (the “Shane Study”) was conducted on behalf of an industry association.\footnote{195} 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.\footnote{196} The

\footnote{191} The U.S. Supreme Court recognized this central point in KSR v. Teleflex, 550 U.S. 398, 427 (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.”


\footnote{193} Elhauge, supra note 80, at 559; Golden, supra note 1, at 531 (2010); 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).

\footnote{194} See Cotropia and Lemley, supra note 6.

\footnote{195} Shane, supra note 192 at 2-6.

\footnote{196} Id. at 9 n.2. Dr. Shane’s study does not disclose the respondent’s experiences with patent valuation or the full range of responses.
study concludes that apportionment “would result in a decrease of between $225.4 billion and $431.2 billion of the value of public corporations.” Additionally, this study projects that apportionment may drive patent holders to reduce research and development expenditures, the number of employees and/or the level of employee compensation and benefits. 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.

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 is an objectively accurate starting point. Appellate scrutiny of damage awards has been lacking for decades. Perhaps one of the most problematic aspect of the Shane Study’s conclusions is the singular focus on the existing rights of incumbent patent holders. Yet in fact the economic and creative framework for inventive activity is far more complex, a circumstance which sheds some doubts 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. Calibrating awards for incumbent patent owners to the true value of the inventive contribution would allow subsequent inventive activity to succeed. Currently, subsequent improvers are taxed with payments for portions

197 Id. at 4.
198 Id.
199 Id. at 6.
200 Durie and Lemley, supra note 1, at 628.
201 See generally, Rochelle Cooper Dreyfuss, The Federal Circuit: A Case Study in Specialized Courts, 64 N.Y.U. L. REV. 1, 12 (1989) (noting that “the 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.”).
of patents that are not the patentee’s contribution.\textsuperscript{202} Lowering the 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 now 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.

\textbf{VI) THE APPORTIONMENT DECISION MAKER: JUDGE OR JURY?}

Introducing apportionment raises the question of whether the step should be performed by the court or a jury. The former proposed Patent Reform legislation allowed judges the authority to apportion as part of the court’s gatekeeping role to ensure that only relevant evidence reach a jury.\textsuperscript{203} That position is well supported by established practice. That is, the court’s identification of the portion of a claim to be valued prevents irrelevant and prejudicial information from contaminating a jury’s damages ruling. Certainly judges make far more fact-intensive decisions routinely without a jury, such as those involving contract interpretation, geographical facts demonstrating personal jurisdiction, and whether an expert possesses sufficient qualifications to meet the \textit{Daubert} standard.\textsuperscript{204}

\textsuperscript{202} These legal theories are consistent with research performed in other fields, including the psychology of scientific creativity and sociology. \textit{See generally}, Landers, \textit{supra} note 21, 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.


On the other hand, the Federal Circuit has considered the separation of the invention from the prior art for a Graham nonobviousness analysis a factual issue for the jury, and reviewed under the substantial evidence standard.\textsuperscript{205} As an issue related to damages, an argument can be made that apportionment should be decided by a jury. To some degree, the Seventh Amendment, which governs to the right to jury trials in civil cases, may be determinative.\textsuperscript{206} As a brief overview, the Seventh Amendment does not establish a right to jury trial in all civil cases, but instead preserves rights existent at the time of the amendment’s ratification in 1791.\textsuperscript{207} At a minimum, the right to a jury trial is compelled “in suits at common law.”\textsuperscript{208} Although this language appears to encompass entire causes of action, it has been interpreted to require a more narrow analysis to the specific issue to be tried.\textsuperscript{209} As an example familiar to those in the patent field, \textit{Markman v. Westview} separated the issue of claim construction from infringement for the Court’s Seventh Amendment analysis.\textsuperscript{210} As a final step, where the Seventh Amendment counsels in favor of trial by jury, the jury decides issues of fact and the court decides issues of law.\textsuperscript{211} Thus, if one concludes that the Seventh Amendment weighs in favor of finding a trial by jury, the issue must be categorized as either legal (for the court) or factual (for a jury).

\textsuperscript{205} See, \textit{e.g.}, Rothman v. Target Corp., 556 F.3d 1310, 1317 (Fed. Cir. 2009); Muniauction, Inc. v. Thomson Corp. 532 F.3d 1318, 1324 (Fed. Cir. 2008). For an analysis that judges are better positioned to decide the factual underpinnings of nonobviousness, see Michael J. Meurer and Katherine J. Strandburg, \textit{Patent Carrots And Sticks: A Model Of Nonobviousness}, 12 LEWIS & CLARK L. REV. 547, 567-68 (2008).

\textsuperscript{206} U.S. Const. amend. VII (declaring, “[i]n 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.”).

\textsuperscript{207} See Allen & Pardo, \textit{supra} note 204 at 1779.

\textsuperscript{208} See Mary Kay Kane, \textit{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”).

\textsuperscript{209} 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”).


Although the analysis has undergone analytic variations, generally the Seventh Amendment inquiry is a multi-part examination. First, an historical component examines whether the issue was tried to a jury at common law in 1791, or one analogous to it.\textsuperscript{212} Once identified, the issue is categorized according to the nature of relief sought to determine whether it was heard in the courts of law or equity.\textsuperscript{213} If the issue was tried in the courts of law, then the issue was tried to a jury; if equitable, to the court.\textsuperscript{214} This component of the test is not literally applied; rather one accounts for current the merger of law and equity.\textsuperscript{215} Second, if the first part of the analysis does not resolve this question then a number of functional and pragmatic considerations guide the result.\textsuperscript{216}

Typically, courts have concluded that the Seventh Amendment dictates that juries decide the level of compensatory damages in civil actions.\textsuperscript{217} However, not all issues relating to monetary relief have been held to warrant Seventh Amendment treatment, as demonstrated by the Supreme Court’s \textit{Cooper Industr. v. Leatherman Tool Group} hold that punitive damages are not an issue of fact for the jury.\textsuperscript{218} 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 in a claim construction analysis, the court may be in a position to consider the consequences of the line drawing that will be required to implement

\begin{itemize}
\item\textsuperscript{212} \textit{See} Chauffeurs, Teamsters and Helpers, Local No. 391 v. Terry, 494 U.S. 558 (1990).
\item\textsuperscript{216} \textit{See} Allen & Pardo, \textit{supra} note 204 at 1779-80.
\item\textsuperscript{217} \textit{Cf.} Feltner v. Columbia Pictures Television, Inc., 523 U.S. 340 (1998) (copyright case noting that juries have historically decided the amount of damages).
\item\textsuperscript{218} \textit{Cooper Industr. v. Leatherman Tool Group}, 532 U.S. 424 (2001).
\end{itemize}
apportionment. 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 1800’s, although not exclusively so. No reported patent decisions from the 1791 era appears to have considered apportionment. At that time in the U.S., the patent system was only one year old and any actions brought during that time would likely have been legal. 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. 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 U.S. That is, apportionment was implemented after claiming became an established practice and monetary awards in equity became more common. Furthermore, at least one appellate decision characterizes reasonable royalty awards as equitable in nature. Admittedly, the historic analysis must be viewed in light of the merger of law and equity. Yet that line of inquiry appears to lead nowhere because under current law apportionment has been barred from implementation.

\[\text{\textsuperscript{219}}\] Cf. Meuer and Strandburg, \textit{supra} note 205 at 573-74 (discussing policy reasons to treat nonobviousness as an issue of law).

\[\text{\textsuperscript{220}}\] See Karl B. Lutz, \textit{Evolution of the Claims of U.S. Patents}, 20 J. PAT. OFF. SOC’Y 134, 143 (1938) (suggesting that cases in equity were not brought in the U.S. until later than 1810).

\[\text{\textsuperscript{221}}\] See Hornblower v. Boulton, 101 E.R. 1285 (1799); Devlin, \textit{supra} note 205, at 65-72 (describing accounting procedures in the courts of equity).


\[\text{\textsuperscript{223}}\] Merrell Soule Co. v. Powdered Milk Co., 7 F.2d 297, 300 (2d Cir. 1925) (a reasonable royalty was “damages recovered and recoverable in equity.”); see also Georgia-Pacific Corp. v. U.S. Plywood-Champion Papers, Inc., 446 F.2d 295, 302 n.10 (2nd Cir.1971) (same, citing Merrell Soule).


\[\text{\textsuperscript{225}}\] Fromson v. Western Litho Plate and Supply Co., 853 F.2d 1568, 1578 (Fed. Cir. 1988).
As the Markman decision suggests, when the historic analysis provides no clear answers, functional considerations may inform whether the judge or jury is better suited to apportion claims. Asking the court to apportion the claim compared to the prior art is preferable. This is because such an assessment may require the competence level of an experienced judge rather than a lay jury.\textsuperscript{226} Allowing courts to make the apportionment decision allows precedent to be shaped, where similar claims are apportioned in a similar manner.\textsuperscript{227} Further, such determinations might integrate economic policy, including incentive theory, the needs of particular industries and the economics of improvement.

However, if this conclusion is ultimately rejected and apportionment is deemed to derive from the courts of law, 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 certain policies relating to technology areas, or to create certainty through precedent that signals the types of claims that may be able (or unable, 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. If that route is not followed then any jury who takes on the task should be specifically instructed to apportion the claim prior to valuation. Those who are interested in more jury transparency would have the option of asking the jury to expressly do so via a special verdict form.

\textsuperscript{226} Markman, 517 U.S. at 388 (identifying competence as one reason to treat an issue as legal).

\textsuperscript{227} See Cooper Industr. v. Leatherman Tool Group, 532 U.S. 424, 440 (2001) (identifying that the ability to compare judgments warrants treating punitive damage awards as legal).
The current patent statute governing reasonable royalty recovery, 35 U.S.C. section 284, requires apportionment. This solution will increase the accuracy of damage awards and the correct starting point for compensation for the patentee’s injury. Apportionment is compelled by the current damages statute’s history and purpose. Moreover, implementing apportionment is consistent with the fundamental purpose of the patent system, as demonstrated by the economics of improvement.