

REASONABLE ROYALTY FOR PATENT INFRINGEMENT OF NON-DIRECT REVENUE PRODUCING PRODUCTS

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ABSTRACT

In today's information age, data is immensely valuable. Data is so valuable that many companies are willing to give away products and services in order to generate it. Once these companies have this data, they are able to monetize it typically via advertising or licensing access to their vast database. But, what if the products or services these companies give away infringe upon a valid patent? What is the correct remedy to an injured patentee against a defendant whose accused product or service generates no direct revenue? A royalty that reaches through to the final product enabled by the patented technology, analogous to the reach-through royalty used in the biotechnology and pharmaceutical industries seems applicable in these cases and can be supported by a correct application of the Georgia-Pacific reasonable royalty factors. Valuing this enabling technology as a building block and analogous to the basic research tools of the biotechnology industry in constructing

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damages remedies will achieve an equitable result while still maintaining the incentives of the patent system.

CONTENTS

I.	Introduction.....	212
II.	Patent Litigation and Data Generation Business Models.....	216
A.	Data Generation Business Models	217
III.	Patent Damages.....	222
A.	Remedies	222
B.	Remedies as a Deterrence	226
IV.	Development of the Reasonable Royalty.....	230
V.	<i>Georgia-Pacific</i> Factors and Alternatives	240
A.	The <i>Georgia-Pacific</i> Factors Applied to Non-Direct Revenue Producing Infringing Products	240
B.	Comparable Licenses	250
VI.	Reasonable Royalty Based on a Reach-Through Royalty.....	254
A.	Background	255
B.	Application to Non-Direct Revenue Producing Products.....	257
VII.	Conclusion	262

I. INTRODUCTION

How much would you be willing to pay to make a Google search? A penny per search? A penny per one hundred searches? Google processes one hundred billion

searches a month, all at no cost to the user.¹ Why? Because the service of answering your search query and generating the data is more valuable to Google than the service it is providing you. Google and other information-age businesses such as Facebook, Twitter, and Instagram are at their hearts, advertising companies. Their customers are not the public, but the companies that want to advertise and sell products and services to the public. The product that these information companies sell is the aggregation of millions of users' data, their preferences, their search history, and their proclivity to purchase online products and services. A single person's data is worthless to Google; however, aggregation of millions of users' data is invaluable. Google's ability to direct advertisements at users based on their individualized preferences is what makes Google's advertising model special and quite valuable. Google reported quarterly revenue of almost sixteen billion dollars in the quarter ending June 30, 2014, providing evidence of the value of Google's business model.²

In generating this data, Google utilizes an impressive array of search technology. What if the search technology infringes on a patent owned by a third party? Software Rights Archive, LLC certainly believed Google was infringing on its valid patents pertinent to search technology when it filed suit against Google in November of 2007 in the

¹ See Dan Farber, *Google Search Scratches Its Brain 500 Million Times a Day*, C|NET.COM (May 13, 2013, 6:16 PM), <http://www.cnet.com/news/google-search-scratches-its-brain-500-million-times-a-day> [<http://perma.cc/XL75-8TXH>].

² Press Release, Google Inc., *Google Inc. Announces Second Quarter 2014 Results and Management Change* (July 17, 2014) http://investor.google.com/earnings/2014/Q2_google_earnings.html [<http://perma.cc/4NQ6-TJDY>].

United States District Court for the Eastern District of Texas.³

Remedies in patent infringement cases typically take the form of money damages and possibly an injunction against the infringer.⁴ Money damages are usually in the form of lost profits resulting from lost sales due to the infringing product.⁵ A typical damages remedy in a patent infringement case where the plaintiff cannot demonstrate lost profits would take into account the price of the infringing product when determining a reasonable royalty damages award should the fact-finder find the alleged infringer liable.⁶ But wait, Google does not charge anything to do a search. And therein lies the conundrum.

First, this Comment will explore the business models that exploit technologies to generate data for revenue producing products and posit what is the correct way to calculate a reasonable royalty on patent infringement for data generating products or services, where the plaintiff cannot demonstrate lost profits. In Part III, this Comment

³ Complaint at 2-4, 6, Software Rights Archive, LLC v. Google Inc., 2009 U.S. Dist. LEXIS 26640 (E.D. Tex. 2009) (No. 2:07-CV-511). Complaint filed against Google, asserting United States Patent No. 5,544,352, “Method and Apparatus for Indexing, Searching, and Displaying Data”, and United States Patent No. 5,832,494 “Method and Apparatus for Indexing, Searching, and Displaying Data” and United States Patent No. 6,233,571 “Method and Apparatus for Index, Searching, and Displaying Data” against Google and in its prayer for relief asking for *inter alia* an injunction, a finding of willful infringement, damages in no event less than a reasonable royalty, and enhanced damages due to willful infringement, *id.* See *infra* note 115. The case eventually settled with no public announcement of the settlement terms, *id.*

⁴ 35 U.S.C. §§ 283–84 (2015).

⁵ *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1156 (6th Cir. 1978).

⁶ 35 U.S.C. § 284.

will take a deeper look into patent remedies and explore the issues of deterrence and efficient infringement. Part IV further explores the development of patent infringement remedies with a focus on the *Georgia-Pacific* reasonable royalty factors including the hypothetical negotiations.⁷ Courts and damages experts look upon the fifteen *Georgia-Pacific* reasonable royalty factors when determining the damages award due to the plaintiff, in the event the plaintiff prevails and cannot demonstrate lost profits.⁸

Next, this Comment will look at *Georgia-Pacific* factors in the context of awarding damages in cases where the plaintiff cannot show lost profits, the infringing product produces no direct revenue, and the court awards a reasonable royalty in the alternative. Part V will argue that awarding no damages is inequitable and logically incongruent with the purpose of patent law.⁹ This Comment will also argue that using comparable licenses is unworkable due to lack of transparency of existing licensing deals and the myriad of complex technologies involved, which makes comparisons difficult if not impossible.¹⁰ Finally, in Part VI, this Comment will argue that a correct model for damages in this context is analogous to the reach-through royalty used in the biotechnology and pharmaceutical industries for a patent remedy damages calculation.¹¹

⁷ *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D. N.Y. 1970).

⁸ See *infra* note 80 and accompanying text.

⁹ See *infra* Part V.A.

¹⁰ See *infra* Part V.B.

¹¹ See *infra* Part VI.

II. PATENT LITIGATION AND DATA GENERATION BUSINESS MODELS

Intellectual property suits are all the rage these days, with patent infringement suits becoming news fodder.¹² For example, *Vanity Fair*'s June 2014 issue included a business feature on patent litigation titled “The Great Smartphone War,” chronicling the well-known patent litigation between technology powerhouses Apple and Samsung.¹³ Although this suit happened to be between two technology stalwarts, a significant number of suits tend to pit non-practicing entities (“NPEs”), pejoratively known as patent trolls, against established technology companies, seeking compensation for alleged infringement of their patents.¹⁴ Damages in patent infringement cases have exploded in recent years,¹⁵ with trial courts returning damages awards in the seven, eight, and nine figures.¹⁶ For example, in *Lucent*

¹² See generally Edgar Walters, *Tech Companies Fight Back Against Patent Lawsuits*, N.Y. TIMES, Jan. 23, 2014, at A23A, http://www.nytimes.com/2014/01/24/us/tech-companies-fight-back-against-patent-lawsuits.html?_r=0 [<http://perma.cc/M4LG-9RRS>] (*New York Times* article discussing patent litigation suits brought by patent assertion entities).

¹³ Kurt Eichenwald, *The Great Smartphone War*, VANITY FAIR, June 2014, at 98, available at <http://www.vanityfair.com/business/2014/06/apple-samsung-smartphone-patent-war> [<http://perma.cc/E2ZG-JHL3>].

¹⁴ Christopher S. Marchese et al., *Retooling Patent Damages Law for NPE Cases*, 14 SEDONA CONF. J. 47, 47 (2013).

¹⁵ Thomas F. Cotter, *Four Principles for Calculating Reasonable Royalties in Patent Infringement Litigation*, 27 SANTA CLARA COMPUTER & HIGH TECH. L. J. 725, 725 (2011); Christopher B. Seaman, *Reconsidering the Georgia-Pacific Standard for Reasonable Royalty Patent Damages*, 2010 BYU L. REV. 1661, 1663–65 (2010).

¹⁶ *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1308 (Fed. Cir. 2009) (vacating 358 million dollar damages verdict).

Technologies v. Gateway, a patent litigation suit involving audio compression technology, the jury awarded 1.53 billion dollars in damages to Lucent against defendant Microsoft.¹⁷

A prevailing plaintiff may be entitled to an injunction enjoining the defendant from further infringing activities as well as a monetary damages award, typically plaintiff's lost profits, "but in no event less than a reasonable royalty for the use made of the invention by the infringer."¹⁸ NPEs, by the very nature of their business model, cannot show lost profits, as they have no revenue generating product lines. Instead, they focus on obtaining a reasonable royalty for the infringement. In some cases however, the defendant can also demonstrate that the accused infringing product or service generates no direct revenue for the company. On its face, the original *Georgia-Pacific* reasonable royalty analysis that introduced the *Georgia-Pacific* factors failed to consider a non-direct revenue scenario.

A. Data Generation Business Models

New business models in the information age focus on selling data gathered by technology companies. Companies use technology to entice customers into revealing their personal data. Then companies use that data to monetize their technology. By increasing the number of customers willing to reveal this coveted information by giving away their products and services, the companies hope to increase their database of information, which they then leverage and sell.

Many very famous technology companies are successfully employing this business model. Google's free internet search, which collects data on individual searches

¹⁷ *Lucent Techs., Inc. v. Gateway, Inc.*, 509 F.Supp. 2d 912, 937–38 (S.D. Cal. 2007) (vacating the jury verdict award of 1.53 billion dollars and finding for the defendant Microsoft as a matter of law), *aff'd on other grounds*, 543 F.3d 710 (Fed. Cir. 2008).

¹⁸ 35 U.S.C. §§ 283–84 (2015).

that customers perform, is but one prime example. Google places targeted, directed advertisements on the user’s search results and aggregates the data and user patterns for future use.¹⁹ Google accomplishes this via directed key word advertising that it sells to companies. Facebook allows any user to complete a free public profile and create a network of friends, all at the same time indicating the user’s likes and preferences, so that Facebook can place directed advertisements on the user’s Facebook home page.²⁰ Internet technology companies are not the only companies utilizing this business model of monetizing customer provided data. DNA sequencing company 23andMe considered giving away its DNA sequencing test and building a database of human DNA sequences that it could then package and sell to pharmaceutical companies.²¹ While

¹⁹ Nathan Newman, *Search, Antitrust, and the Economics of the Control of User Data*, 31 YALE J. ON REG. 401, 425 (2014) (noting in general that Google’s market dominance in internet search has raised antitrust and competitiveness concerns, and explaining that, “[i]n a nutshell, Google’s whole business model is based on getting users to give up their private information, allowing Google to trade its knowledge about them to advertisers to better tailor ads and enhance the payoff of advertising for firms). *See generally*, Omer Tene, *What Google Knows: Privacy and Internet Search Engines*, 2008 UTAH L. REV. 1433 (2008) (pointing out that Google stores each user’s search history, which raises some serious privacy concerns).

²⁰ Chris J. Hoofnagle & Jan Whittington, *Free: Accounting for the Costs of the Internet’s Most Popular Price*, 61 UCLA L. REV. 606, 630 (2014) (providing that “[i]ndeed, Facebook’s business model is focused on attracting third parties into monetized agreements for personal information.”).

²¹ Valerie Gutmann Koch, *PGTandMe: Social Networking-based Genetic Testing and the Evolving Research Model*, 22 HEALTH MATRIX 33, 50 (2012) (stating, “[u]ltimately, many of the PGT [personal genetic testing] companies’ business models do not focus on profits from the sale of genetic tests, but from gathering the genetic and personal data that can be licensed and sold to institutions, academic researchers, or drug companies”). *See generally*, Herman T.

23andMe has yet to give away its DNA sequencing test, nevertheless it has entered into agreements with other companies providing access to the data it has collected.²²

Common to all of these business models is a product that produces no direct revenue from the sale or use of the product, but which produces valuable ancillary data that the companies can then use to create a revenue stream. In the case of Google, the actual product that produces a revenue stream is the data and analysis of the data Google performs. If Google's internet search engine infringes patented technology in the methods or algorithms that the software uses to index and retrieve websites, but does not infringe any patented technology in the production of the saleable data, then what is the appropriate royalty on such an infringing use?

In a typical patent infringement suit, a reasonable royalty based on the revenue stream attributed to the infringing product seems appropriate. The royalty rate multiplied by the royalty base computes the damages award

Tavani & Maria Bottis, *DNA Databanks and Informed Consent*, in *BIOINFORMATICS LAW: LEGAL ISSUES FOR COMPUTATIONAL BIOLOGY IN THE POST-GENOME ERA* 181 (Jorge L. Contreras & A. James Cuticchia eds., 2013) (noting serious ethical considerations and privacy concerns over DNA databanks in which users may or may not have properly consented to their DNA profiles being sold and used by third-party companies or researchers).

²² Press Release, 23andMe, Inc., 23andMe Announces Collaboration with Pfizer Inc. to Conduct Genetic Research Through 23andMe's Research Platform (Jan. 12, 2015) <http://mediacenter.23andme.com/blog/2015/01/12/23andme-pfizer-research-platform/> [<http://perma.cc/SC4U-AB4N>]; Press Release, 23andMe, Inc., 23andMe and Genentech to Analyze Genomic Data for Parkinson's Disease (Jan. 6, 2015) <http://mediacenter.23andme.com/blog/2015/01/06/23andme-genentech-pdf/> [<http://perma.cc/LX37-PBPZ>].

due to the plaintiff.²³ In cases where the revenue royalty base is zero, any royalty percentage based solely on the revenue stream of the actual infringing product would in effect award no damages to the plaintiff. While this Author knows of no cases where a trial court accepted such a rationale, intuitively it makes paradoxical sense. However, in a real world context, this makes no sense as the infringing technology enabled the production of the actual saleable product, even if that product itself did not infringe the patents in-suit.

Alternatively, some argue that the best way to determine the appropriate valuation and hence damages award is to look at comparable licenses that other companies have negotiated and paid.²⁴ In a typical infringement suit, where the infringing product is sold or used and is subject to licensing agreements from a standards setting organization, calculating damages based on comparable licenses and authorized royalty rates from the standards setting organizations makes sense. Unfortunately, most comparable licenses are in effect not comparable when dealing with non-standard technologies or patents considered non-essential by standards settings organizations.²⁵ For example, international standards setting organizations publish communication rules between computers in the form of

²³ See *infra* Part IV for a more detailed discussion of the royalty base and the royalty rate.

²⁴ See John C. Jarosz & Michael J. Chapman, *The Hypothetical Negotiation and Reasonable Royalty Damages: The Tail Wagging the Dog*, 16 STAN. TECH. L. REV. 769, 785–89 (2013) (discussing the usage of real-world licenses).

²⁵ See Cotter, *supra* note 15, at 747 (“For purposes of crafting reasonable royalties ex post, however, courts should be careful that the supposedly comparable licenses, or the selected royalty rates and bases, are the types of licenses, rates, and bases that the parties themselves realistically would have considered ex ante. The use of comparable licenses in particular can be tricky.”).

internet protocols, but internet search algorithms are free from such restrictions. From shrouded secrecy and reluctance to disclose these licenses, other obstacles including inherent complex technology differences and unequal bargaining power between the licensor and the licensee make these comparisons weak and illusory at best.

However, looking at the biotechnology world may illuminate a possibility—a reach-through royalty. A reach-through royalty is a royalty based on a final product that uses a patented process or building block in developing or manufacturing the final product.²⁶ Many biotechnology companies utilize basic research, processes, tools, or starter materials that enable rapid development or prototyping of products.²⁷ As conduits in the research and development process, the patent owners of these *building blocks* assert that their royalty should reach-through to the final product. Similarly, patent owners that file suit against internet advertising companies could assert that their patent(s) enabled the collection of the data that the companies are selling, and therefore the royalty award should be able to reach-through to the final actual revenue-producing product.

²⁶ See Patrick Hagan, *Reach Through Royalties as Workaround for Patent Exhaustion*, 2 HASTINGS SCI. AND TECH. L.J. 243 (2010) (citing Thomas J. Kowalski, *Reach-through licensing: A US Perspective*, 6 J. OF COMMERCIAL BIOTECH. 349 (2000)). A classic counter argument against a reach-through royalty is extending the argument to authorize royalties to anything made from a patented hammer. See Christina Bohannon, *IP Misuse as Foreclosure*, 96 IOWA L. REV. 475, 518–20 (2011). However, this argument is not as strong as it appears. Hammers are typically sold, not licensed. DONALD S. CHISUM, 5-16 CHISUM ON PATENTS § 16.03 (2015). A lawfully purchased patented item is subject to the exhaustion doctrine that allows the purchaser to use, resell, or repair the purchased patented item. *Id.*

²⁷ See Michael J. Stimson, *Damages for Infringement of Research Tool Patents: The Reasonableness of Reach Through Royalties*, 2003 STAN. TECH. L. REV. 3 (2003).

III. PATENT DAMAGES

The application of a property or liability rule to patent infringement stems from patent theory and the principles behind patent law itself. The United States Constitution empowers Congress to “promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”²⁸ The exclusive right mentioned in the Constitution suggests that a property rule is justified; however, the goal of promoting progress and innovation suggests perhaps that a liability rule is preferred. Steve Jobs, the deceased CEO of Apple, was famously quoted for having said, “I’m willing to go to thermonuclear war on this” when discussing the patent litigation between Apple and Google.²⁹ Jobs, likely would have supported a property rule in patent damages remedies.

A. Remedies

Once the patentee has established infringement by the defendant, the court is free to shape the remedy due to the patentee based on 35 U.S.C. §§ 283–284. The application of a property rule versus a liability rule has a significant influence in the shaping of an appropriate remedy. As a property right, injunctive relief seems a natural

²⁸ U.S. CONST. art. I, § 8, cl. 8.

²⁹ WALTER ISAACSON, *STEVE JOBS* 512 (2011). Steve Jobs passed away on October 5, 2011 at the age of fifty-six from complications arising from pancreatic cancer. Steve Jobs was an American entrepreneur, technologist, visionary, and innovative genius. Jobs revolutionized the computer, mobile phone, music, and movie industries; Steve Jobs gave the commencement speech at Stanford University on June 12, 2005. He finished his speech with this advice: “Stay Hungry. Stay Foolish.” Steve Jobs, CEO, Apple Inc., Commencement Address at Stanford University (June 12, 2005) (transcript *available at* <http://news.stanford.edu/news/2005/june15/jobs-061505.html> [<http://perma.cc/9HB-3KD7>]).

extension of the grant of exclusivity the government has granted the patent-holder.³⁰ This exclusivity defines the patent holder's right to exclude others from making, using, selling, or importing the invention.³¹ However, the U.S. Supreme Court in *eBay Inc. v. MercEXCHANGE, LLC* held that the court must evaluate the remedy of injunctive relief through the traditional equitable balancing factors.³² Prior to this opinion, the courts usually granted a permanent injunction in recognition of the property rule as enforcement of the right of exclusivity.³³ Justice Kennedy in his concurring opinion overtly suggested that application of a property rule and a property-based justification on damages is not appropriate in certain patent infringement suits, particularly if the plaintiff is a non-practicing entity.³⁴

³⁰ See *Smith Int'l, Inc. v. Hughes Tool Co.*, 718 F.2d 1573, 1581 (Fed. Cir. 1983) (“The very nature of a patent right is the right to exclude others.”).

³¹ 35 U.S.C. § 271 (2015).

³² *eBay, Inc. v. MercEXCHANGE, LLC*, 547 U.S. 388 (2006) (holding that permanent injunctive relief in patent infringement cases should apply the traditional four-factor balancing test (1) irreparable injury, (2) monetary damages are inadequate to compensate for the injury, (3) balance of hardships warrant an injunction, and (4) public interest would not be disserved by the injunction).

³³ *MercEXCHANGE, LLC v. eBay, Inc.*, 401 F.3d 1323, 1339 (Fed. Cir. 2005) (“We therefore see no reason to depart from the general rule that courts will issue permanent injunctions against patent infringement absent exceptional circumstances.”).

³⁴ *eBay*, 547 U.S. at 396 (Kennedy, J., concurring) (“In cases now arising trial courts should bear in mind that in many instances the nature of the patent being enforced and the economic function of the patent holder present considerations quite unlike earlier cases. An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees.”). The industry that Justice Kennedy refers to consists primarily of non-practicing entities that acquire patents through various means and attempt to monetize these patents by enforcing the

Additionally, whether or not the court issues an injunction, damages for past infringement must also be determined.

A liability rule seeks to compensate the injured party in a manner to restore that party to the state before the injury, akin to tort or breach of contract liability.³⁵ Application of a liability rule to patent infringement allows courts to determine damages based on lost profits or, in the event that the plaintiff cannot demonstrate economic harms, the statute authorizes an award not “less than a reasonable royalty.”³⁶ However, the statute also suggests that the damages award should not be punitive, but solely an amount “adequate to compensate for the infringement (emphasis added).”³⁷ Adequacy can be interpreted to mean these damages awards may be viewed either from a perspective of deterrence or compensation.³⁸ Additionally, courts have the authority to award enhanced damages based on a finding of willful infringement and the awarding of reasonable attorney’s fees in exceptional cases.³⁹ From a policy perspective, if courts

patent rights against practicing entities in the electronics industry. *See generally* Marchese et al., *supra* note 14.

³⁵ *Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1538, 1578 (Fed. Cir. 1995) (Newman, Cir. J., dissenting in part and concurring in part) (“Patent infringement is a commercial tort.”).

³⁶ 35 U.S.C. § 284 (2015).

³⁷ *Id.*

³⁸ *Rite-Hite Corp.*, 56 F.3d at 1538; *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152 (6th Cir. 1978). Deterrence is not necessarily the same as a punitive award. A punitive damages award is intended as a punishment, while a damages award intended to deter is not. A punitive damages award however, may also be a deterrence. *See generally* Brian J. Love, *The Misuse of Reasonable Royalty Damages as a Patent Infringement Deterrent*, 74 MO. L. REV. 909 (2009) (noting the usage of reasonable royalty damages awards as punitive in nature).

³⁹ 35 U.S.C. §§ 284–285.

desire that patent infringement remedies deter would-be infringers optimally, an economic framework and understanding of damages and its effects on infringement must be explored, which is addressed in Section III.B.

A weak argument exists for a damages remedy theory consisting of lost profits or a reasonable royalty arising from convoyed-sales.⁴⁰ The convoyed-sales rule as articulated by the Federal Circuit allows damages to be computed on non-patented articles when sold with infringing articles if the two “function together . . . in some manner so as to produce a desired end product or result. All the components together must be analogous to components of a single assembly or be parts of a complete machine, or they must constitute a functional unit.”⁴¹ However, it is not clear if such a rule is actually applicable to a defendant in a patent infringement lawsuit with the accused product having no direct revenue. First, the accused product and the resulting advertising sales do not appear to qualify since they do not work together to produce a “desired end product or result.” The advertisement sold to a third party is a result of the accused product not a component of a single assembly nor part of a functional unit. Second, even if we were to assume that the accused product actually produced a revenue, here sales of the accused product and the resulting data are non-contemporaneous and to different customers. Thus, the two products are “sold” distinctly apart from each other, and not together for “marketing reasons.”⁴² Given this, the Federal Circuit’s rationale providing “there is no basis for extending that recovery to include damages for items that are neither competitive with nor function with the patented invention”

⁴⁰ Rite-Hite Corp., 56 F.3d at 1550.

⁴¹ *Id.*

⁴² *Id.* at 1551.

supports declining to apply a convoyed-sales rule in this context.⁴³

B. Remedies as a Deterrence

Roger Blair and Thomas Cotter present a simplified general theory of damages designed to make infringement unprofitable.⁴⁴ In this simplified model, the damages award is equal to the infringer's expected profit in the event that infringement is detected and enforced.⁴⁵ Since detection of infringement and enforcement is uncertain, by necessity the calculation is probabilistic and based on the probability of detection of infringement.⁴⁶ "In a stochastic world, we can make this risky venture unprofitable in an expectations sense."⁴⁷ Because the probability of detection of infringement is necessarily less than or equal to one, the damages award must be the infringer's expected profit divided by the probability of detection of infringement.⁴⁸ For example, if an infringer's expected profit is one million dollars and the probability of detection of infringement and enforcement is 20%, then the damages award would be one million dollars divided by 0.2, which would result in a damages award of five million dollars. While this simplified model fails to take into account a number of ancillary effects, it suffices to present a baseline theory to explore further appropriate damages theories based on effective

⁴³ *Id.*

⁴⁴ ROGER D. BLAIR & THOMAS F. COTTER, *INTELLECTUAL PROPERTY: ECONOMIC AND LEGAL DIMENSIONS OF RIGHTS AND REMEDIES* 45–46 (2005).

⁴⁵ *Id.* at 46.

⁴⁶ *Id.* at 45.

⁴⁷ *Id.*

⁴⁸ *Id.* at 46.

deterrence.⁴⁹ Based on this theory, calculation of damages “may be necessary to preserve the incentive structure, both by deterring infringement and by appropriately compensating the rights holder when infringement does occur.”⁵⁰

Blair and Cotter model various outcomes between would-be infringers and patentees utilizing their simplified economic model, under circumstances where the infringer “is (1) equally efficient, (2) less efficient, and (3) more efficient than the patentee.”⁵¹ Based on the economic analysis of the efficiency of the patentee and the infringer, Blair and Cotter summarize the optimal damages rules:

First, when the infringer’s use of the patent is no more efficient than the patentee’s, the minimum sanction should be the restitution of the profit attributable to the infringement. Second, when the infringer is the more efficient user, the minimum sanction should be the amount of the royalty the patentee and infringer would have agreed to *ex ante*.⁵²

In certain cases, would-be infringers may decide that infringement of a patent may actually be the more efficient business decision from their own perspective, even if they are the less efficient user of the patented invention with respect to the patent holder. Similar to efficient breach of contract, where it is economically advantageous to breach the contract as opposed to perform the obligations of the contract, efficient infringement by the infringer may be the

⁴⁹ *Id.*

⁵⁰ BLAIR & COTTER, *supra* note 44, at 42.

⁵¹ *Id.* at 50–57.

⁵² *Id.* at 57.

economically advantageous decision.⁵³ Here, efficient infringement is not the same concept as used by Blair and Cotter to describe economic efficiencies of the users of the technology, but rather a rational economic business decision by the would-be infringer to potentially infringe or license. Is the patent valid and enforceable? Are the infringers aware of the patent? Does the accused product actually infringe? How high are the transaction costs in negotiating a license versus potential litigation costs and potential future damages awards? In some circumstances, a potential infringer may prefer to infringe and pay the appropriate damages *ex post*, as opposed to actually negotiating a license *ex ante*.⁵⁴ Additionally, current remedies in patent law suggest that the law favors efficient infringement.⁵⁵

⁵³ See William S. Dodge, *The Case for Punitive Damages in Contracts*, 48 DUKE L.J. 629, 631 (1999) (“Efficient breach has now become the standard explanation of why punitive damages are not awarded for breach of contract.”). Willful breach of contract arguably is a moral wrong, but the law does not consider morality when determining a contractual breach remedy. See generally, Aditi Bagchi, *Managing Moral Risk: The Case of Contract*, 111 COLUM. L. REV. 1878 (2011); Andrew S. Gold, *A Moral Rights Theory of Private Law*, 52 WM. & MARY L. REV. 1873 (2011); Seana Valentine Shiffrin, *The Divergence of Contract and Promise*, 120 HARV. L. REV. 708 (2007).

⁵⁴ See Julie S. Turner, *The Nonmanufacturing Patent Owner: Toward a Theory of Efficient Infringement*, 86 CALIF. L. REV. 179, 204–05 (1998) (proposing liability rules in instances of efficient infringement when “a patent owner [is] unwilling to use the patent or license it to others on fair and reasonable terms”).

⁵⁵ John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 560–61 (2010) (“Similarly, U.S. patent law’s combination of a lost-profits remedy and lack of a disgorgement remedy might be viewed as effectively favoring efficient users of an invention—those who use it most profitably—over less efficient users or licensors.”). In the context of the electronics industry, the alleged infringers are usually the more economically efficient user of the technology, particularly when non-practicing entities assert their patents. Absent the alleged infringers, arguably the technology would not be available

Considering the goals of the patent system and patent laws, an adequate remedy for patent infringement that is desirable from society's perspective is a remedy that adequately deters infringement and effectively promotes the progress of science and innovation despite the infringement. Some level of deterrence is necessary to signal to innovators that society will protect their inventions and their capital investments against infringement; however, excessive damages may have a negative impact on innovation, and in some cases deter efficient infringement. Companies that potentially face excessive or punitive liability from non-willful infringement may be discouraged from investing in research and development and continuing the innovative output of the U.S. economy. Direct infringement of a patent is a strict liability offense.⁵⁶ While patents provide protection of the intellectual property created by inventors, this property right is inherently different from that of real property. The patent right is granted by society in exchange for knowledge, unlike a piece of land that is purchased. The intellectual property right is subject to limitations deemed to be in society's best interests to maintain the progress of science and innovation. The courts and Congress express these limitations by shaping the remedy due to the patentee in the event that the patentee's rights have been infringed. These limitations should take into account the overall policy

to the public at all. Further, even if the patentee is actively practicing the invention, but the infringer is the more economically efficient user of the invention, society bears the cost when the patentee's patent rights are enforced. Roger D. Blair & Thomas F. Cotter, *Rethinking Patent Damages*, 10 TEX. INTELL. PROP. L.J. 1, 46 (2001).

⁵⁶ See Roger D. Blair & Thomas F. Cotter, *Strict Liability and its Alternatives in Patent Law*, 17 BERKELEY TECH. L.J. 799, 800 (2002) (examining other possible liability regimes including but eventually rejecting one analogous to an intentional tort by recognizing an independent invention defense).

rationales, economic consequences, and goals of the patent system.

IV. DEVELOPMENT OF THE REASONABLE ROYALTY

Patent law has always recognized a damages award for actual economic harms to the patentee in the event of infringement originating in the original Patent Act of 1790.⁵⁷ While Congress has modified damages statutes through the years, each Congressional modification addressed damages in a slightly different manner with the concept of a reasonable royalty codified in the Patent Act of 1946.⁵⁸ Historically, in the event that the patentee could not establish economic harms, only nominal damages were due to the patent holder.⁵⁹ Recognition of the inequities of this remedy

⁵⁷ Patent Act of April 10, 1790, ch. 7, § 4, 1 Stat. 109, 111, http://ipmall.info/hosted_resources/lipa/patents/Patent_Act_of_1790.pdf [<http://perma.cc/B32M-LSX5>] (providing that an infringer shall “forfeit and pay to the said patentee . . . such damages as should be assessed by a jury”).

⁵⁸ See Patent Act of August 1, 1946, ch. 726, 60 Stat. 778 (“ . . . and upon a judgment being rendered in any case for an infringement the complainant shall be entitled to recover general damages which shall be due compensation for making, using, or selling the invention, not less than a reasonable royalty therefor, together with such costs, and interest, as may be fixed by the court.”); Erick S. Lee, *Historical Perspectives on Reasonable Royalty Patent Damages and Current Congressional Efforts for Reform*, 13 UCLA J.L. & TECH. 1, 7–8 (2009).

⁵⁹ *United States Frumentum Co. v. Lauhoff*, 216 F. 610, 614–15 (6th Cir. 1914) (“There is a finding that the patent was valid; that the defendant Lauhoff, who had sold the patent, infringed it extensively and so endeavored to keep what he had sold; and that defendants’ sales were so large that no one can doubt the actual existence of substantial damages. Under such circumstances, to have plaintiff recover nothing, because the difficulty of absolutely definite proof is insuperable, is a result so unfortunate that, if avoidable, it should not be permitted.”).

led to the development of the reasonable royalty and refinements of the law of patent damages. This section introduces the reasonable royalty factors as identified in the seminal *Georgia-Pacific* opinion along with some criticisms of its application.

Judicial recognition of a reasonable royalty damages award was firmly established in *Suffolk Co. v. Hayden*,⁶⁰ in which the U.S. Supreme Court elucidated the test for damages to be “the loss to the patentee.”⁶¹ The Court further clarified, “there being no established patent or license fee in the case, in order to get a *fair* measure of damages, or even an approximation to it, general evidence must necessarily be resorted to (emphasis added).”⁶² Despite a setback in *Coupe v. Royer*,⁶³ the development of the reasonable royalty continued by the Sixth Circuit Court of Appeals’ decision in *United States Frumentum Co. v. Lauhoff* which analogized patent infringement with the wrongful possession of property.⁶⁴ The U.S. Supreme Court’s decision in *Dowagiac*

⁶⁰ *Suffolk Co. v. Hayden*, 70 U.S. 315 (1866).

⁶¹ *Id.* at 320.

⁶² *Id.*

⁶³ *Coupe v. Royer*, 155 U.S. 565, 583 (1895) (holding that the plaintiff must prove the actual profits of the infringer). “But even in equity the profits which the complainant seeks to recover must be shown to have been actually received by the defendant. As was said in the case just referred to, ‘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, by the use of the plaintiff’s invention; or, in other words, the fruits of the advantage which he derived from the use of that invention, over what he would have had in using other means then open to the public and adequate to enable him to obtain an equally beneficial result. If there was no such advantage in his use of the plaintiff’s invention, there can be no decree for profits.’” *Id.*

⁶⁴ *United States Frumentum Co.*, 216 F. at 615 (“Infringement upon the patentee’s rights is a tort; it is a taking of the patentee’s property.”).

Mfg. Co. v. Minn. Moline Plow Co. blessed the use of a reasonable royalty determination in patent infringement damages.⁶⁵

After the codification of damages utilizing a reasonable royalty calculation in the Patent Act of 1946, the *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.* decision established the modern day reasonable royalty.⁶⁶ The *Panduit* decision not only established the elements the plaintiff must show in order to be entitled to lost profits, but also the analysis to be used when the plaintiff could not establish lost profits.⁶⁷ While the decision in *Panduit* acknowledged the difficulties in determining the reasonable royalty based on the legal fiction of hypothetical negotiations it nonetheless established the usage of hypothetical negotiations between the infringer and the patentee. The court noted the “legal fiction” upon which the

⁶⁵ *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 648–49 (1915) (recognizing the difficulty in using either lost sales or established royalty as the basis for a damages remedy calculation, and allowed the use of general evidence to demonstrate a reasonable royalty).

⁶⁶ *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1157–58 (6th Cir. 1978) (“When actual damages, e.g., lost profits, cannot be proved, the patent owner is entitled to a reasonable royalty. A reasonable royalty is an amount ‘which a person, desiring to manufacture and sell a patented article, as a business proposition, would be willing to pay as a royalty and yet be able to make and sell the patented article, in the market, at a reasonable profit.’”).

⁶⁷ *Id.* at 1163 (“In fixing a reasonable royalty, the primary inquiry, often complicated by secondary ones, is what the parties would have agreed upon, if both were reasonably trying to reach an agreement. This must be modified by the commercial situation, and when the result is to interfere with a patent monopoly, which the patentee was in position to and desired to keep, by retaining the entire market himself, his compensation for parting against his will with that opportunity must take due account of the loss to him of anticipated profits on the business which the licensees will thus get away from him.”).

hypothetical negotiations would commence, as a negotiation between a “willing patent owner and licensee” in a world in which the infringement has yet to occur.⁶⁸ The court was also Nostradamian in predicting the problem of compulsory licenses being extracted from patentees unwilling to license, and the usage of the hypothetical negotiations to determine the terms of that license.⁶⁹ The patentee’s right to exclude seems rather ephemeral where a would-be infringer may fail to negotiate a license *ex ante*, then infringe anyways, and judicially extract a license *ex post*. The court recognized that awarding a reasonable royalty might amount to judicial enforcement of a licensing agreement that the patent-holder neither wanted nor was willing to enter into, but the court is forcing upon the patent-holder only due to the infringer’s activities.⁷⁰

Essential to the computation of damages arising from the reasonable royalty are the two primary components of the calculation—the royalty base and the royalty rate.⁷¹ The royalty base consists of the sales of the infringing product properly apportioned.⁷² The entire market value rule states that if demand for the product is directly attributable to the infringed patent or the product as a whole entails the

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1350 (Fed. Cir. 2000) (“Royalties are ordinarily computed based upon the sales of a patented product or process.”); *Cornell Univ. v. Hewlett-Packard Co.*, 2008 U.S. Dist. LEXIS 41848, at *4 (N.D. N.Y. May 27, 2008) (“Two factors are central to the reasonable royalty calculation—the royalty base (the product sales which would be subject to the reasonable royalty), and the royalty rate. Once these amounts have been set, calculation of the reasonable royalty is a straightforward multiplication exercise.”).

⁷² *Ericsson, Inc. v. D-Link Sys.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014).

infringed patent, then the entire sales price is to be included in the royalty base.⁷³ Otherwise, the royalty base consists of the sales price of the infringing product apportioned according to the incremental value added by the infringed patent.⁷⁴ The Federal Circuit has rejected the 25% rule of thumb for the royalty rate, in which the patentee would receive 25% of the value of the product.⁷⁵ The Federal Circuit rejected the 25% rule as “a fundamentally flawed tool for determining a baseline royalty rate in a hypothetical negotiation” because “it fails to tie a reasonable royalty [rate] base to the facts of the case at issue.”⁷⁶ An expert providing an opinion on a reasonable royalty rate “must carefully tie proof of damages to the claimed invention’s footprint in the market place.”⁷⁷ The Federal Circuit has blessed use of comparable licenses and the *Georgia-Pacific* factors in determining a reasonable royalty rate.⁷⁸

Responding to the criticisms and difficulties in determining the factual inquiries necessary to recreate the hypothetical negotiations between a willing licensee and willing licensor, the decision in *Georgia-Pacific Corp. v. United States Plywood Corp.* outlined fifteen factors to be

⁷³ *Rite-Hite Corp.*, 56 F.3d at 1549–50.

⁷⁴ *Ericsson*, 773 F.3d at 1226.

⁷⁵ *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1318 (Fed. Cir. 2011).

⁷⁶ *Id.* at 1315.

⁷⁷ *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010).

⁷⁸ *Uniloc*, 632 F.3d at 1317–18 (“This court has sanctioned the use of the *Georgia-Pacific* factors to frame the reasonable royalty inquiry. Those factors properly tie the reasonable royalty calculation to the facts of the hypothetical negotiation at issue. This court’s rejection of the 25 percent rule of thumb is not intended to limit the application of any of the *Georgia-Pacific* factors.”).

used in reasonable royalty determinations.⁷⁹ Most courts and experts cite these factors today in patent litigation

⁷⁹ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970). The reasonable royalty factors identified by the opinion:

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

damages awards.⁸⁰ While this landmark decision introduced a framework designed to provide guidance to the determination of a reasonable royalty, the court itself noted the inherent difficulties in making this determination, as “there is no formula” to automatically determine a reasonable royalty.⁸¹

The lack of definiteness and clarity of the *Georgia-Pacific* factors has led to considerable criticism of the

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12. The portion of the profit or of the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.
 13. The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer.
 14. The opinion testimony of qualified experts.
 15. The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee—who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention—would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

⁸⁰ See, e.g., *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286 (Fed. Cir. 2014); *Apple Inc. v. Samsung Elecs. Co.*, 2014 U.S. Dist. LEXIS 165975 (N.D. Cal. Nov. 25, 2014); *Emblaze Ltd. v. Apple Inc.*, 52 F. Supp. 3d 949 (N.D. Cal. 2014); *Microsoft Corp. v. Motorola, Inc.*, 2013 U.S. Dist. LEXIS 60233, at *54 (W.D. Wash. Apr. 25, 2013) (noting the “frequently cited” *Georgia-Pacific* opinion); *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111 (N.D. Cal. 2011); *Lucent Techs. Inc. v. Gateway, Inc.*, 509 F. Supp. 2d 912 (S.D. Cal. 2007); *Applera Corp. v. MJ Research Inc.*, 389 F. Supp. 2d 344, 349 (D. Conn. 2005).

⁸¹ *Georgia-Pacific*, 318 F. Supp. at 1120–21.

doctrine.⁸² The various criticisms include the expansive and often-manipulated factors themselves, the use of non-comparable licenses, and the result of a hypothetical *ex ante* negotiation that occasionally results in a damages award exceeding the defendant's profits.⁸³ Additionally others have argued that the use of factor fifteen, "[t]he amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement," has predominantly become the definition of a reasonable royalty.⁸⁴ Seemingly, the courts have seized upon this factor as the catchall rationale that encompasses and subsumes all of the *Georgia-Pacific* factors in one.⁸⁵

Unfortunately, use of the hypothetical negotiation is premised upon the existence of a valid, enforceable, and infringed patent.⁸⁶ Further, it is assumed that the result of the hypothetical negotiation will "naturally lead to *fair and reasonable* compensation for the patent holder."⁸⁷ This does not necessarily follow. Fair and reasonable compensation to the patent-holder may actually be punitive and inefficient from the perspective of the infringer and society as a whole.

⁸² Paul M. Janicke, *CONTEMPORARY ISSUES IN PATENT DAMAGES*, 42 AM U. L. REV. 691, 719 (1993).

⁸³ COTTER, *supra* note 15, at 730.

⁸⁴ JAROSZ & CHAPMAN, *supra* note 24, at 772, 782. Notably the willing licensor willing licensee hypothetical negotiation is only one of the fifteen articulated factors yet has overwhelmingly become the preferred method of computing a reasonable royalty. *Id.* at 772. "Its long-standing and widespread use has led many courts to go so far as to *define* a reasonable royalty as the outcome of a hypothetical negotiation." *Id.*

⁸⁵ *Id.* at 772 n.9.

⁸⁶ JAROSZ & CHAPMAN, *supra* note 24, at 783.

⁸⁷ *Id.*

If the patent-holder is a non-practicing entity and the reasonable royalty damages award makes the infringer's activities unprofitable, then rationally the infringer will stop its infringing activities. The infringer ceasing the infringing activities deprives both the patent-holder of its on-going royalty award and potentially society of the benefit of the technological innovation. The damages award would essentially act as an injunction as opposed to damages adequate to compensate, without any of the equitable balancing factors normally used by the courts. Alternatively, if the infringer were the more efficient user of the patented technology, and in order to maintain a profit margin the infringer logically raised its prices to account for the royalty, society has suffered artificially due to monopolistic deadweight loss. If damages awards in the form of a reasonable royalty are general damages intended to be compensatory as opposed to punitive or to deter infringement, it is unclear why or how a negotiation resolves this issue.⁸⁸ It is interesting to note that in the final *Georgia-Pacific* decision the court awarded a damages amount that it determined to be fair compensation to U.S. Plywood, despite the availability of the results of the hypothetical negotiation that suggested a different award.⁸⁹

Further criticisms of the hypothetical negotiation stem from the process of the hypothetical negotiation itself. It is unclear what the precise goal of the negotiation should be, how to factor in the strength of the patent involved in the litigation, and how the timing of the negotiation should affect the result.⁹⁰ Concerning the goal of the negotiation, should the outcome of the negotiation be licensing terms the

⁸⁸ JAROSZ & CHAPMAN, *supra* note 24, at 786.

⁸⁹ *Georgia-Pacific Corp. v. U. S. Plywood-Champion Papers Inc.*, 446 F.2d 295, 296 (2d Cir. 1971).

⁹⁰ Jarosz & Chapman, *supra* note 24, at 791.

parties “would have agreed to” or “should have” agreed to?⁹¹ When negotiating a real-world license, a litany of issues concerning the patent itself including its validity, enforceability, and liability for infringement lead to a host of issues during the negotiations. In a real world licensing negotiation, these issues regarding the patent will have a significant effect upon the negotiation. A valid patent, validated from either previous litigation, a post-grant review, or an *inter partes* review will carry considerably more weight than a newly granted patent. Experienced negotiators will appropriately discount the royalty rate in the presence of such uncertainties as a tradeoff against potential litigation risks and other transaction costs.⁹² A reasonable royalty calculation determined by the courts should consider how much of a discount third parties incorporated into their actual negotiated licenses where these patent issues were not judicially resolved.⁹³ Another issue is how much *ex post* information after a judicial determination of liability should be incorporated into the remedial phase of the trial and hence into the hypothetical *ex ante* negotiations.⁹⁴ There is a serious risk of hindsight bias, given the judicial determination of patent validity, infringement, and exposure to liability.⁹⁵

⁹¹ *Id.* at 791–92.

⁹² Mark A. Lemley & Carl Shapiro, *Patent Holdup and Royalty Stacking*, 85 TEX. L. REV. 1991, 1995–2008 (2007); Steven J. Shapiro, *Pitfalls in Determining the Reasonable Royalty in Patent Cases*, 17 J. LEGAL. ECON. 75, 82 (2010);

⁹³ Jarosz & Chapman, *supra* note 24, at 797.

⁹⁴ *Id.* at 799–800.

⁹⁵ There is a real danger of the jury wanting to punish the defendant even if instructed that the damages award is a means to compensate the plaintiff, not to punish the defendant. Human nature tends to want to punish those who have seemingly committed a wrong. Love, *supra* note 38, at 910.

V. *GEORGIA-PACIFIC* FACTORS AND ALTERNATIVES

Given these limitations and considerations, this section considers the *Georgia-Pacific* factors in light of liability for a non-direct revenue producing product or service, such as Google’s internet search service, that infringes a patent when asserted by a non-practicing entity. Part A discusses application of the factors in this context and discusses the illogical conclusion of a straightforward application of the *Georgia-Pacific* factors while Part B considers the use of comparable licenses.

A. *The Georgia-Pacific Factors Applied to Non-Direct Revenue Producing Infringing Products*

Georgia-Pacific factors one through four and seven relate to existing licensing schemes either that the patentee or the infringer may or may not already have in existence with third parties. Factors one and two consider “an established royalty” already received by the patentee and “rates paid by the licensee for the use of other comparable patents.”⁹⁶ Application of factors one and two are applicable in the context of both non-direct revenue producing and

⁹⁶ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D. N.Y. 1970). *See also* *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010) (vacating the damages award and warning courts to be “vigilant” when considering licenses not related to the technology in the patent-in-suit under the first *Georgia-Pacific* factor); *Ericsson, Inc. v. D-Link Sys.*, 773 F.3d 1201, 1227 (Fed. Cir. Dec. 4, 2014) (holding that licenses that are not completely analogous affect the weight of the evidence, not its admissibility); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1211 (Fed. Cir. 2010) (reiterating that technology and economic differences between the litigants must be considered under *Georgia-Pacific* factors one and two); *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1326 (Fed. Cir. 2009) (noting that the question of whether the royalty should be a running royalty or a lump sum royalty is subsumed into *Georgia-Pacific* factor two).

direct-revenue producing products, provided such licensing agreements exist and are comparable. Factors three and four consider the “nature and scope of the license” and the patentee’s willingness to license in light of the patentee’s desire to “maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve that monopoly.”⁹⁷ Factors three and four work against NPEs because the NPE business model relies on generation of royalties from patents to as many licensees as possible. Factor seven considers the “duration of the patent and term of the license.”⁹⁸ Factor seven is generally neutral, but may be important where a patent term has a relatively small remaining lifetime or in a technological field where the technology may become obsolete quickly.

Factors five, six, and ten bear indirectly on patent infringement suits where the alleged infringing technologies have no direct revenue, but are very relevant when the patentee is a NPE. Factor five considers the relationship between the infringer and the patentee in terms of “the commercial relationship between the licensor and licensee,” and explicitly considers if their relationship is one of

⁹⁷ *Georgia-Pacific*, 318 F. Supp. at 1120. See also *Lucent*, 580 F.3d at 1335 (noting that non-exclusive licenses generally have lower royalty rates); *Ericsson*, 773 F.3d at 1230 (noting that Ericsson’s commitment to RAND (reasonable and non-discriminatory) licensing precludes Ericsson from maintaining a patent monopoly).

⁹⁸ *Georgia-Pacific*, 318 F. Supp. at 1120. See also *Microsoft Corp. v. Motorola, Inc.*, 2013 U.S. Dist. LEXIS 60233, *60 (W.D. Wash. Apr. 25, 2013) (discussing that this factor is not applicable in the RAND licensing context); *Magnetar Techs. Corp. v. Six Flags Theme Parks*, 2014 U.S. Dist. LEXIS 15675, *14 (D. Del. Feb. 7, 2014) (theorizing that a longer patent duration would lead to higher royalty rates since customer goodwill and loyalty can be leveraged over the remaining length of the patent term).

“inventor and promoter.”⁹⁹ For NPEs, factor five arguably favors the infringer against a NPE, because a NPE is in the business of licensing its technology not competing against the infringer, logically leading to a more favorable rate for the infringer. Factor six considers the ancillary effects of the patented technology by considering “the effect of selling the patented specialty in promoting sales of other products of the licensee” as well as the “value of the invention to the licensor as a generator of sales of his non-patented items.”¹⁰⁰ This

⁹⁹ *Georgia-Pacific*, 318 F. Supp. at 1120. See also *Ericsson*, 773 F.3d at 1230–31 (noting that this factor is irrelevant in the RAND setting, as Ericsson must offer non-discriminatory licenses); *i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 853 (Fed. Cir. 2010) (accepting damages expert’s reasoning that the relationship between i4i and Microsoft as direct competitors would increase the royalty rate), *aff’d* 131 S.Ct. 2238 (2011); *Apple Inc. v. Samsung Elecs. Co.*, 2014 U.S. Dist. LEXIS 165975, *131–134 (N.D. Cal. Nov. 25, 2014) (noting that Samsung’s increasing market share and competitiveness as a direct competitor with Apple, the patentee, with respect to this factor only slightly favors Apple in this case); *Microsoft Corp. v. Motorola, Inc.*, 2013 U.S. Dist. LEXIS 60233, *58–59 (W.D. Wash. Apr. 25, 2013) (noting that in the case of RAND licensing, factor five is inapplicable as the licensing terms are non-discriminatory); *Commonwealth Sci. & Indus. Research Organisation v. Cisco Sys.*, 2014 U.S. Dist. LEXIS 107612, *46 (E.D. Tex. July 23, 2014) (noting that the litigants are not competitors and that this factor favors a reduction in the royalty rate); *Innovention Toys, LLC v. MGA Entm’t, Inc.*, 2012 U.S. Dist. LEXIS 156733, *11–12 (E.D. La. Nov. 1, 2012) (finding that commercial relationship includes a consideration of the relative economic size and influence of the parties); *Datatrans Corp. v. Wells Fargo & Co.*, 2011 U.S. Dist. LEXIS 118443, *55 (E.D. Tex. Aug. 1, 2011) (noting that the parties are not competitors and thus this factor favors a lower royalty rate).

¹⁰⁰ *Georgia-Pacific*, 318 F. Supp. at 1120. See also *Univ. of Pittsburgh of the Commonwealth Sys. of Higher Educ. v. Varian Med. Sys.*, 561 Fed. Appx. 934, 947 (Fed. Cir. 2014) (noting that damages awards may reflect increased value to non-patented features if the patented invention is the source of the increased value for the non-patented features); *Minks v. Polaris Indus.*, 546 F.3d 1364, 1372–73 (Fed. Cir. 2008) (suggesting that a higher reasonable royalty could have been

factor works against the NPE in two ways when the infringing product produces no direct revenue. First, the infringer does not sell the patented specialty. Second, the licensor has no sales of any product, patented or non-patented, nor any sales of the patented specialty to compete with the infringer. Factor ten takes into account the commercial nature of the licensor as a NPE by considering “the nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.”¹⁰¹ While the nature of the invention plays a role,

determined based on the sales of non-patented products); *TV Interactive Data Corp. v. Sony Corp.*, 2012 U.S. Dist. LEXIS 61004, *11–12 (N.D. Cal. May 1, 2012) (denying TVI’s discovery request of Sony sale summaries related to its PlayStation3 products because of a lack of a nexus between TVI’s alleged auto-play invention in the PlayStation3 and sales generation of non-patented PlayStation3 products); *Datatreasury*, 2011 U.S. Dist. LEXIS 118443 at *56 (noting the absence of a causal link between the alleged infringed claim and other services in deciding the factor is inapplicable); *OPTi Inc. v. Apple Inc.*, 2009 U.S. Dist. LEXIS 112537, *11–12 (E.D. Tex. Dec. 3, 2009) (holding that allowing submission of total revenue of accused computers and not just chipsets was not in error as such information is relevant to this factor as to the extent of derivative sales).

¹⁰¹ *Georgia-Pacific*, 318 F. Supp. at 1120. See also *Finjan*, 626 F.3d at 1211 (holding that there was sufficient evidence to support a jury finding that the patented invention were not tiny features in the accused products); *Lucent*, 580 F.3d at 1332–33 (holding that date-picking feature of Microsoft Outlook contributed an insubstantial portion of the value of Microsoft Outlook and could not support the jury verdict award of \$357,693,056.18); *Carnegie Mellon Univ. v. Marvell Tech. Group, Ltd.*, 2012 U.S. Dist. LEXIS 120556, *6–8 (W.D. Pa. Aug. 24, 2012) (noting that the availability of non-infringing alternatives would tend to have an effect of lowering royalty rates); *Medtronic Sofamor Danek USA, Inc. v. Globus Med., Inc.*, 637 F. Supp. 2d 290, 311 (E.D. Pa. 2009) (noting that the plaintiff’s patented product is highly innovative and provides many

more relevant is the licensor’s commercial embodiment of the patented invention. If the licensor does not practice the invention commercially, this would tend to work against the licensor, while the benefits to the user of the invention would weigh against the infringer.

Factors eight, nine, eleven, twelve, and thirteen relate to the utility, commercial success, and what portion of that success is attributable to the patented technology of the alleged infringing product. Factor eight considers the “established profitability of the product made under the patent” and “its commercial success,” while factor nine considers “the utility and advantages of the patent.”¹⁰²

advantages and benefits over the prior art and tends to support a higher royalty rate).

¹⁰² *Georgia-Pacific*, 318 F. Supp. at 1120. See also *Finjan*, 626 F.3d at 1209 (noting that a higher profit margin on the accused product tends to support a higher reasonable royalty); *Lucent*, 580 F.3d at 1335 (indicating that while the accused product’s profit margin of approximately 70–80% supports a higher reasonable royalty, the low marginal utility of the date-picking feature over the prior art favors a lower reasonable royalty); *Apple Inc. v. Samsung Elecs. Co.*, 2013 U.S. Dist. LEXIS 163312, *15 (N.D. Cal. Nov. 13, 2013) (noting that demand for the patented product is relevant to the inquiry under *Georgia-Pacific* factor eight); *Positive Techs., Inc. v. Sony Elecs., Inc.*, 2013 U.S. Dist. LEXIS 26289, *13–15 (N.D. Cal. Feb. 26, 2013) (holding that plaintiff is entitled to discovery under *Georgia-Pacific* factors six, eight, and eleven due to defendant’s alleged infringing e-Readers (Nook and Amazon e-Readers) as evidence pertaining to the sales of content and accessories is probative of the value of the alleged patent in the accused product); *Medtronic*, 637 F. Supp. 2d at 311 (noting that the extremely high profit margin of the accused product supports a higher reasonable royalty); *Ericsson*, 773 F.3d at 1231 (noting that *Georgia-Pacific* factor nine is inapplicable to standard essential patents, as they are not an improvement, but are essential to operation of the standard); *Cisco*, 2014 U.S. Dist. LEXIS 107612 at *47–48 (finding clear evidence that the utility, advantages, and benefits of the patent to the WiFi industry favored an increase in the reasonable royalty); *Datatresury*, 2011 U.S. Dist. LEXIS 118443 at *33 (noting the availability of non-infringing alternatives in

Arguably, these factors weigh against the infringer if the revenue producing product is considered to be made under the patent. However, if interpreted literally, factor eight bears no weight on the royalty determination if the infringed technology has no revenue and thus no profitability, regardless of any utility or advantages of the patent. Factors eleven, twelve, and thirteen consider the extent of the infringer's "use of the invention" and "evidence probative of the value of that use" along with "the profit" and the "portion of realizable profit that should be credited to the invention."¹⁰³ Applying these factors directly to non-

consideration of *Georgia-Pacific* factor nine potentially puts a significant ceiling on a reasonable royalty rate); *Rosco, Inc. v. Mirror Lite Co.*, 626 F. Supp. 2d 319, 333 (E.D. N.Y. 2009) (noting the advantages of having a wider field of view in a cross view mirror tends to support a higher reasonable royalty).

¹⁰³ *Georgia-Pacific*, 318 F. Supp. at 1120. See also *Finjan*, 626 F.3d at 1211 (noting that *Georgia-Pacific* factor eleven looks at use by the infringer, not necessarily use by the customer of the alleged infringing product); *Lucent*, 580 F.3d at 1333–35 (indicating that frequent usage of the invention implies higher value of the patented feature, but Lucent has the burden of proving the extent to which the date-picking feature had been used to support the damages award); *Apple*, 2014 U.S. Dist. LEXIS 165975 at *134–136 (finding continued infringement and use of the invention probative of utility and advantages of the patented technology); *Icon-IP Pty Ltd. v. Specialized Bicycle Components, Inc.*, 2014 U.S. Dist. LEXIS 130447, *11–14 (N.D. Cal. Sept. 15, 2014) (holding in a discovery dispute that *Georgia-Pacific* factors eight and eleven are inapplicable to non-accused products lacking a theory that connects to the patented technology); *Microsoft*, 2013 U.S. Dist. LEXIS 60233 at *61–62 (noting in the RAND context the necessity to separate the value and use of the patented technology from its incorporation into the standard from that of its incorporation into an accused product); *Internet Machs. LLC v. Alienware Corp.*, 2013 U.S. Dist. LEXIS 115723, *62–64 (E.D. Tex. June 19, 2013) (noting the value of a business is not necessarily the same as the value of the asserted invention); *Datatresury*, 2011 U.S. Dist. LEXIS 118443 at *59–60 (noting that the infringement consists of only 5% of total check volume processed

revenue producing infringing products, factors twelve and thirteen suggest that the lack of revenue from the infringing product weighs heavily against the licensor. However, considering factor eleven, the infringer’s use of the patent and value created from that use, in context with factors twelve and thirteen suggests that any profit created from the use of the patent should be apportioned and be relevant in a royalty calculation.

by U.S. Bank and this tends to lower the reasonable royalty rate); *i4i Ltd. P’ship v. Microsoft Corp.*, 670 F. Supp. 2d 568, 591–92 (E.D. Tex. 2009) (holding that i4i’s damages expert properly considered the value of the infringing product by comparison to a comparable competing product); *Lucent*, 580 F.3d at 1333 (noting that the portion of the profit attributable to the date-picking feature of Microsoft Outlook is “exceedingly small”); *Microsoft*, 2013 U.S. Dist. LEXIS 60233 at *62 (noting in the RAND context that non-RAND licenses are not comparable); *TV Interactive Data Corp. v. Sony Corp.*, 929 F. Supp. 2d 1006, 1017 (N.D. Cal. 2013) (disallowing testimony on licenses to patent pools where there is no technology or economic nexus to the negotiated hypothetical license and the patents in the pool); *Halo Elecs. v. Pulse Elecs.*, 900 F. Supp. 2d 1160, 1166 (D. Nev. 2012) (noting that the license negotiated by the licensee prior to the defendant gaining a controlling interest in the licensee relevant to *Georgia-Pacific* factor twelve); *Dataquill Ltd. v. High Tech Computer Corp.*, 2012 U.S. Dist. LEXIS 53164, *19–21 (S.D. Cal. Apr. 16, 2012) (indicating that a single license or agreement cannot establish a customary royalty rate under *Georgia-Pacific* factor twelve); *Internet*, 2013 U.S. Dist. LEXIS 115723 at *46–47 (noting usage of sufficiently comparable licenses under *Georgia-Pacific* factor twelve justifiable in helping to determine the reasonable royalty); *Function Media, L.L.C. v. Google Inc.*, 2010 U.S. Dist. LEXIS 3273, *12–13 (E.D. Tex. Jan. 15, 2010) (permitting expert testimony regarding outside consultant’s valuation of technology companies using a royalty rate as relevant and admissible under *Georgia-Pacific* factor twelve); *Paltalk Holdings, Inc. v. Microsoft Corp.*, 2009 U.S. Dist. LEXIS 131090, *8–10 (E.D. Tex. Feb. 25, 2009) (noting that Microsoft’s Xbox patents may be relevant to the reasonable royalty analysis under *Georgia-Pacific* factor thirteen, but Microsoft failed to demonstrate how this evidence would be relevant to the litigation issues).

The final factors, fourteen and fifteen, are the general catch-all provisions authorizing the usage of expert testimony to assist in calculation of the reasonable royalty, along with the fictionalized hypothetical negotiations between a willing licensor and a willing licensee.¹⁰⁴

The *Georgia-Pacific* factors are a judicial construct that attempts to restrain and circumscribe a reasonable royalty calculation, but that is not always successful.¹⁰⁵ First, the hypothetical negotiation posits a legal fiction and a hypothetical that cannot adequately recreate *ex post* the result of a negotiation in the prescribed *ex ante* fashion. By definition, the remedy phase of a trial requires the judicial system to construct a remedy for the injured party because the parties to the litigation were unable to come to an agreement or settlement.

Second, the hypothetical negotiation attempts to create a fictionalized contractual expectation interest remedy to the patentee.¹⁰⁶ If patent infringement is viewed as a commercial tort, then the reasoning behind the hypothetical negotiation is absurd.¹⁰⁷ Applying a tort-like theory of

¹⁰⁴ See *Datatreasury Corp.*, No. 2:06-CV-72 DF, 2011 U.S. Dist. LEXIS 118443, at *61 (noting that *Georgia-Pacific* factor fifteen “generally encompasses” all the factors).

¹⁰⁵ See Marchese et al., *supra* note 14, at 47. “The proposal eliminates the unrealistic, unstructured approach of *Georgia-Pacific* and its potential for mischief.” *Id.* at 52.

¹⁰⁶ Jarosz & Chapman, *supra* note 24, at 786 (“[R]easonable royalty damages are a form of *general damages* intended to compensate for the *tort* of patent infringement. They are not, and were not intended to be, a form of contract damages, retroactive or otherwise”). Even if viewed as a form of contract damages, patent infringement remedies would still not in most cases support a punitive damages award, but rather only at most an expectation damages award.

¹⁰⁷ *Id.* Imagine the tort of battery. Using the rationale of the hypothetical negotiation, the appropriate remedy would be determined by having negotiations between the victim and the batterer negotiating

damages to infringement, the patentee’s compensation is limited to adequate compensation for the harm inflicted. However, for non-practicing entities and in other cases where the patentees cannot demonstrate harms or lost profits, imposition of nominal damages would allow for unfettered rampant infringement.

Third, the hypothetical negotiation presupposes that the licensee would manufacture and sell the patented article and pay a royalty to the licensor such that the licensee would still be able to “make a reasonable profit.” This proposition is far from guaranteed in the complex business world. Further, these negotiations mention nothing of real world considerations, such as non-infringing alternatives, opportunity cost to develop non-infringing alternatives, marketing efficiency, price-demand elasticity, infringement detectability and enforcement, and time to market. Other scholars have identified these considerations and have argued how to apply them in the context of reasonable royalty calculations.¹⁰⁸ Finally, in the case of non-direct

how much the victim would accept to have the batterer commit the battery, before the battery actually occurred.

¹⁰⁸ See generally D. Christopher Holly, *The Book of Wisdom: How to Bring a Metaphorical Flourish Into the Realm of Economic Reality by Adopting a Market Reconstruction Requirement in the Calculation of a Reasonable Royalty*, 92 J. PAT. & TRADEMARK OFF. SOC’Y 156 (2010) (arguing for a reasonable royalty calculation based on market reconstruction based on negotiations taking into account known market conditions and facts and circumstances prior to infringement); Mark A. Lemley, *Distinguishing Lost Profits from Reasonable Royalties*, 51 WM. & MARY L. REV. 655 (2009) (arguing that reasonable royalty damages awards tend to overcompensate non-manufacturing patentees who are unable to demonstrate lost profits); Oskar Liivak, *Establishing an Island of Patent Sanity*, 78 BROOK. L. REV. 1335, 1380–81 (2013) (noting the imprecision and circularity of a reasonable royalty damages calculation and that a negotiated license is a license to make or use things covered by the patent); John W. Schlicher, *Patent Damages, the Patent Reform Act, and Better Alternatives for the Courts and Congress*, 91 J. PAT. & TRADEMARK

revenue producing products, factor fifteen is arguably inapplicable, as the alleged infringer is not actually selling the “particular article embodying the patented invention.”¹⁰⁹

A straightforward application of the *Georgia-Pacific* factors and a hypothetical negotiation using the standard royalty base and royalty rate arising from these negotiations would logically lead to no damages awarded to the patentee when the infringing product produces no revenue. Conventional damages theories posited by the patentees estimate both the royalty base and the royalty rate.¹¹⁰ Regardless of the royalty rate, however, if the infringing

OFF. SOC’Y 19 (2009) (arguing that a reasonable royalty damages award should be based on the economic value of the patent measured by the difference between net profits an infringer earned and net profits an infringer could have earned using the next best non-infringing alternative); Lemley & Shapiro, *supra* note 92, at 82 (noting negotiation considerations including the validity and enforceability of the patent); Cotter, *supra* note 15, at 741–57 (arguing that the reasonable royalty damages calculation should take into account all considerations that would have affected real-world negotiations such as profitability, the availability of a next best alternative, and others); Golden, *supra* note 55, at 551 (noting confidentiality of most licensing agreements and the potential ramifications of forced disclosure); Jarosz & Chapman, *supra* note 24 (arguing for a reasonable royalty damages calculation based on incremental benefits, licensing comparables, and design-around costs); Marchese et al., *supra* note 14 (arguing for elimination of the hypothetical negotiation in cases where the patentee is a NPE and basing the reasonable royalty damages award on either an established royalty or a fully paid-up lump sum award based on the value of patented invention as determined by a comparison over the next best non-infringing alternative); Seaman, *supra* note 15 (arguing for a modification to the reasonable royalty damages calculation when an acceptable non-infringing substitute exists).

¹⁰⁹ *Georgia-Pacific Corp.*, 318 F. Supp. at 1120.

¹¹⁰ See *Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1350 (Fed. Cir. 2000); *Cornell Univ. v. Hewlett-Packard Co.*, 2008 U.S. Dist. LEXIS 41848, *4 (N.D.N.Y. May 27, 2008).

product produces no sales directly, then the damages award would be zero, as the royalty base would be zero. Clearly, this cannot be correct, as this result is incongruent with the aims of the patent system, unfair to the patentee, and would permit infringement with no deterrence for usage of patented technology in violation of federal law.¹¹¹

B. Comparable Licenses

Another possibility for determining damages as suggested by the *Georgia-Pacific* factors is based on the existence of comparable licenses and potentially existing licensing schemes such as fair, reasonable, and non-discriminatory (FRAND) often used by standards setting organizations.¹¹² Standards setting organizations employ FRAND licenses by agreement with their member companies. The patent holder agrees to the licensing terms in exchange for incorporating the technology into the standard.¹¹³

Existing licenses are generally a poor model for determining damages, as there is not enough transparency and similarity in these agreements. Cotter notes this difficulty, as he asserts that

[s]trictly speaking, then, for a license to be economically comparable it should relate to the same patent or patents at issue (and not other patents); it should cover uses or products that are the same as (or at least analogous to) the uses or products at issue; and it should involve the same type of structure (lump-sum

¹¹¹ 35 U.S.C. § 271 (2012).

¹¹² Thomas H. Chia, *Fighting the Smartphone Patent War with RAND-Encumbered Patents*, 27 BERKELEY TECH. L.J. 209, 209–12 (2012).

¹¹³ *Id.* at 212; see Alan Devlin, *Standard-Setting and the Failure of Price Competition*, 65 N.Y.U. ANN. SURV. AM. L. 217, 239 n.102 (2009) (indicating that standard setting organizations have utilized reach-through royalty agreements when it is difficult to value technology not yet incorporated into a commercial product).

or running royalty) that the patentee is seeking to impose in litigation.¹¹⁴

Most licenses are confidential contracts and the parties often do not disclose settlement terms from litigation. For example, Software Rights Archive and Google eventually settled their litigation with terms undisclosed.¹¹⁵ Whitney Levandusky argues that using licensing terms from previously settled patent litigation suits is appropriate in determining a reasonable royalty, essentially arguing that “when a patent is yet to be proven on the market, past valuations at trial become an essential part of the value inquiry.”¹¹⁶ The Federal Circuit seems amenable to allowing such information to be discoverable, having failed to recognize a negotiation settlement privilege.¹¹⁷

Licensing agreements are negotiated between companies outside the specter of litigation between specific parties at arms-length with different business strategies, goals, and negotiating positions; the facts and circumstances surrounding the negotiation of the resulting license are highly unlikely to be applicable to the litigants in an ongoing lawsuit. Further, the types of licenses that the courts have sometimes looked to are not comparable at all, as Cotter notes “courts sometimes have permitted the trier of fact to

¹¹⁴ THOMAS F. COTTER, *COMPARATIVE PATENT REMEDIES: A LEGAL AND ECONOMIC ANALYSIS* 132 (2013).

¹¹⁵ *In re Google Litig.*, No. 5:10cv3723. The final docket entry is a case management conference and neither party made a press release detailing the terms of the settlement.

¹¹⁶ Whitney Levandusky, *In re MSTG and the Shifting Role of Litigation-Related Patent Licenses in Reasonable Royalty Rate Determinations*, 9 J. BUS. & TECH. L. 335, 349–50 (2014).

¹¹⁷ FED. R. EVID. 501 (stating privilege law is generally governed by federal common law); *In re MSTG, Inc.*, 675 F.3d 1337, 1339 (Fed. Cir. 2012).

consider licenses that are not economically comparable at all—for example, licenses involving large portfolios of patents, or using different calculation methodologies.”¹¹⁸ Fortunately, some courts have recognized this problem and have rejected expert reports that erroneously rely on licenses that are not comparable to the facts of the case before the court.¹¹⁹

Courts have repeatedly rejected use of the Nash bargaining solution (NBS) as a mathematical model to solve the two-party bargaining problem.¹²⁰ The NBS is a mathematical theorem proven by Nobel Prize winning mathematician John Nash.¹²¹ The Nash solution “idealizes the bargaining problem” by “generalizing assumptions,” and would award in most cases “*half* of the infringer’s profit, which will be many times the amount of real-world royalty rates.”¹²² The trial court flatly rejected this result as lacking “an anchor for this fifty-percent assumption in the record of

¹¹⁸ Cotter, *supra* note 15, at 730.

¹¹⁹ *Robocast, Inc. v. Microsoft Corp.*, No. 10-1055-RGA, 2014 U.S. Dist. LEXIS 10745, at *9–10 (D. Del. Jan. 29, 2014) (rejecting plaintiff’s damages expert’s use of licenses that were not technologically related to the patents in-suit); *Dynetix Design Solutions, Inc. v. Synopsys, Inc.*, No. C 11-5973 PSG, 2013 U.S. Dist. LEXIS 120404, at *21 (N.D. Cal. Aug. 22, 2013) (ruling on a motion in-limine to exclude usage of a license granted to an academic institution as not comparable); *Lucent Techs., Inc. v. Gateway, Inc.*, 509 F. Supp. 2d 912, 940 (S.D. Cal. 2007) (finding that the license agreements admitted into evidence were not sufficiently relevant to the technology in dispute).

¹²⁰ *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111, 1119 (N.D. Cal. 2011) (“The Nash bargaining solution has never been approved by a judge to calculate reasonable royalties in litigation, at least in the face of objection.”); *Robocast*, 2014 U.S. Dist. LEXIS 10745, at *4–5 (rejecting use of Nash bargaining solution).

¹²¹ *VirnetX, Inc. v. Cisco Sys.*, 767 F.3d 1308, 1325 (Fed. Cir. 2014).

¹²² *Oracle*, 798 F. Supp. 2d at 1119.

actual transactions.”¹²³ If the goal of patent laws were to encourage innovation, then an efficient marketplace in patents may demonstrate the actual value of a patent. An efficient marketplace would provide a better valuation of patents and may provide a basis for courts to determine a reasonable royalty. However, such an efficient marketplace usually does not exist, and non-comparable licenses are a very poor proxy for proper valuation of patents.¹²⁴

John Jarosz and Michael Chapman argue for damages awards based on asset valuation techniques including incremental benefits, licensing comparables, and design-around costs.¹²⁵ The authors propose elimination of the hypothetical negotiation as the basis for a reasonable royalty in favor of valuation from three different perspectives. First, they consider “the incremental benefits generated by infringement relative to the benefits that would be available if the infringer had used the non-infringing, next best alternative.”¹²⁶ Second, they consider “the amounts that have been paid in licenses that are similar to the hypothetical license for the use of technologies that are similar to the patented technology and for uses that are similar to the infringing use made of the patented technology by the infringer.”¹²⁷ Third, they consider “the costs the infringer would have incurred if it had sought to develop and implement a new non-infringing alternative in lieu of practicing the infringed patented technology after the

¹²³ *Id.*

¹²⁴ See Colleen V. Chien, *From Arms Race to Marketplace: The Complex Patent Ecosystem and Its Implications for the Patent System*, 62 HASTINGS L.J. 297, 346–47 (2010) (discussing the differences between “objective” value and “exclusion” value of patents).

¹²⁵ Jarosz & Chapman, *supra* note 24, at 773.

¹²⁶ *Id.* at 812.

¹²⁷ *Id.*

infringer learned the patent in question was valid, enforceable, and infringed.”¹²⁸ The authors argue that existing licenses based on real-world licenses provide an excellent proxy for valuation of the patent.¹²⁹ The authors further recognize that perfectly comparable real-world licenses are unlikely to exist in most cases.¹³⁰ However, they argue that the absence of these real-world licenses should not preclude their use; instead, the reasonable royalty analysis should reconcile and account for those differences.¹³¹ The authors argue comparability of licenses needs to consider the context of the licensed technology, the license terms, and the circumstances surrounding the negotiations or establishment of the license.¹³²

However, the valuation of incremental benefits, licensing comparables, and design-around costs tend to be fundamentally missing in the context of non-revenue producing infringing products. The resulting analysis then tends to fall back to the *Georgia-Pacific* factors that are not dependent on existing or comparable licenses, or an ad-hoc analysis and comparison in an attempt to fit a typical licensing scheme into the situation at hand. In some sense, this is an attempt to fit a square peg into a round hole.

VI. REASONABLE ROYALTY BASED ON A REACH-THROUGH ROYALTY

A reasonable royalty, supported by correct application of the *Georgia-Pacific* factors, based on a reach-through royalty, and tuned to the goals of the patent system,

¹²⁸ *Id.*

¹²⁹ *Id.* at 818–19.

¹³⁰ *Id.* at 819.

¹³¹ Jarosz & Chapman, *supra* note 24, at 819.

¹³² *Id.* at 820.

seems justified. Part A provides the background and rationale of the reach-through royalty while Part B analogizes the use of a reach-through royalty to non-direct revenue producing products.

A. Background

A reach-through royalty views patented technology that enables the technology development of the final saleable product as a building block.¹³³ Then taking into account the value added by the utilized patented technology, the royalty reaches through to the final product, to calculate the reasonable royalty.¹³⁴ For example, in the biotechnology industry companies may license patented starter genetic materials in order to expedite development of their therapeutic products. In this case, the licensing agreement for the starter genetic material may reach-through to the final

¹³³ Christina Bohannon, *IP Misuse as Foreclosure*, 96 IOWA L. REV. 475, 518 (2011); Robin C. Feldman, *The Insufficiency of Antitrust Analysis for Patent Misuse*, 55 HASTINGS L.J. 399, 401 (2003); Janice M. Mueller, *No "Dilettante Affair": Rethinking the Experimental Use Exception to Patent Infringement for Biomedical Research Tools*, 76 WASH. L. REV. 1, 16 (2001); Mark R. Patterson, *Contractual Expansion of the Scope of Patent Infringement Through Field-of-Use Licensing*, 49 WM. & MARY L. REV. 157, 207–08 (2007).

¹³⁴ Richard A. Epstein, *Heller's Gridlock Economy in Perspective: Why There is too Little, Not too Much Private Property*, 53 ARIZ. L. REV. 51, 77 (2011); Ray K. Harris & Rodney J. Fuller, *Technology Barriers: 21st Century IP Basics*, 44 AZ ATTORNEY 22, 23 (2008); Paul T. Nyffeler, *The Safe Harbor of 35 U.S.C. § 271(e)(1): The End of Enforceable Biotechnology Patents in Drug Discovery?*, 41 U. RICH. L. REV. 1025, 1057 (2007); Richard Li-Dar Wang, *Biomedical Upstream Patenting and Scientific Research: The Case for Compulsory Licenses Bearing Reach-Through Royalties*, 10 YALE J.L. & TECH. 251, 254–55 (2008) (arguing for compulsory licenses for researchers with a reach-through provision); Donald R. Ware, *Research Tool Patents: Judicial Remedies*, 30 AIPLA Q.J. 267, 269 (2002); Bohannon, *supra* note 133, at 518; Mueller, *supra* note 133, at 9–10.

therapeutic product.¹³⁵ Likewise, biotechnology companies that produce research tools and basic starter materials have enabled expedited development of many other patented medical technologies and devices.¹³⁶

Thomas Kowalski argues the value of a basic research tool invention is not simply determined by the cost of developing the technology, but rather its value is determined by the marketplace.¹³⁷ Further, he argues that the value comes primarily from the enablement benefit.¹³⁸ By enabling others to make further advances and developments from the basic research to a final therapeutically useful product, a reach-through royalty is justified, even if the royalty is many times that of the development cost of the basic research tool.¹³⁹

¹³⁵ Bayer Ag. v. Housey Pharm., 228 F. Supp. 2d 467, 472–73 (D. Del. 2002) (holding that a reach-through license for a pharmaceutical research method does not constitute *per se* patent misuse); Ajinomoto Co. v. Archer-Daniels-Midland Co., No. 95-218-SLR, 1998 U.S. Dist. LEXIS 3833, at *160 (D. Del. Mar. 13, 1998) (awarding a reach-through royalty of \$1.23 per kilogram of threonine), *aff'd*, 228 F.3d 1338 (Fed. Cir. 2000); Alfred C. Server et al, *Reach-Through Rights and the Patentability, Enforcement, and Licensing of Patents on Drug Discovery Tools*, 1 HASTINGS SCI. & TECH. L.J. 21, 30–31 (2009) (arguing that existing legal framework allows for reach-through licensing and royalties); Kimberlee A. Stafford, *Reach-Through Royalties in Biomedical Research Tool Patent Licensing: Implications of NIH Guidelines on Small Biotechnology Firms*, 9 LEWIS & CLARK L. REV. 699, 700 (2005); Wang, *supra* note 134, at 322. *But see* Integra Lifesciences I, LTD. v. Merck KGaA, 331 F.3d 860, 871–72 (Fed. Cir. 2003) (refusing to “opine” on the applicability of a reach-through royalty to the facts of the case).

¹³⁶ *See* Stimson, *supra* note 27, at 1.

¹³⁷ *See generally* Kowalski, *supra* note 26.

¹³⁸ *See* Kowalski, *supra* note 26. *See also* Wang, *supra* note 134, at 323 (recognizing the value comes from the “contribution” to the final research).

¹³⁹ Kowalski, *supra* note 26.

In the case of biotechnology industries, many companies license the patented basic research technology and agree to pay royalties on the final product.¹⁴⁰ One often noted issue in the biotechnology industry is the tragedy of the anti-commons.¹⁴¹ Academics have noted a deterrent effect due to the need to pay multiple licenses or royalties in order to develop new therapeutics when developers are required to license numerous basic research technologies, which suppresses socially beneficial outcomes.¹⁴²

**B. Application to Non-Direct Revenue
Producing Products**

In a patent infringement suit filed against Google by Oracle America for infringement of Java technology in Google's Android operating system (which was ultimately determined not to infringe), the court invited Oracle to present an early damages expert report.¹⁴³ The court recognized the unique business model of Google and its Android operating system and correctly noted that the alleged infringing product "is not sold" and that "Google profits from Android indirectly."¹⁴⁴ Thus, the court

¹⁴⁰ See Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 699 (1998); Feldman, *supra* note 133, at 440–41.

¹⁴¹ JENNIFER CARTER-JOHNSON ET AL., UNIVERSITY RESEARCH AND LICENSING IN BIOINFORMATICS LAW: LEGAL ISSUES FOR COMPUTATIONAL BIOLOGY IN THE POST-GENOME ERA 97–100 (Jorge L. Contreras & A. James Cuticchia eds., 2013); Heller & Eisenberg, *supra* note 133, at 699. *But see* Abigail Lauer, *The Disparate Effects of Gene Patents on Different Categories of Scientific Research*, 25 HARV. J.L. & TECH. 179, 193–94 (2001) (suggesting that reach-through royalty provisions are not as onerous as they may appear).

¹⁴² See Heller & Eisenberg, *supra* note 140, at 699.

¹⁴³ Oracle Am., Inc. v. Google Inc., 798 F. Supp. 2d 1111, 1119 (N.D. Cal. 2011).

¹⁴⁴ *Id.* at 1117–18.

acknowledged that any valuation of the alleged infringing product must consider the business model, and explicitly recognized that the valuation of Android was dependent on Google’s advertising revenue.¹⁴⁵

Logically, then, any damages must reach-through to the actual product that generates revenue for Google. In a reach-through analogy, applied to the context of Google’s business model, the patentee is the research tool provider and Google is the user of the research tool to produce a final product—the data that enables advertising sales. *Georgia-Pacific* factor six, “the effect of selling the patented specialty in promoting sales of other products of the licensee,” considers the effects of the sale of the patented invention in promoting the sale of other products of the licensee.¹⁴⁶ This factor is relevant but not directly applicable to Google’s business model, as Google does not *sell* the patented specialty.¹⁴⁷ Additionally, *Georgia-Pacific* factors eight through thirteen support the use of a reach-through royalty in this context, by recognizing that the patented invention is instrumental in creating the actual product or service that has a revenue stream. Factor eight speaks to the “profitability of the product made under the patent,” which arguably reaches a derivative product that produces revenue from a non-direct revenue producing infringing product.¹⁴⁸ Factors nine, ten, eleven, and twelve relate to the business model of the alleged infringer, and the use of the patented technology by the

¹⁴⁵ *Id.* (“Google is incorrect in asserting that the overall value of Android is irrelevant and is further incorrect in asserting that advertising revenues have nothing to do with the overall value.”).

¹⁴⁶ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970).

¹⁴⁷ *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111, 1119 (N.D. Cal. 2011).

¹⁴⁸ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D. N.Y. 1970).

infringer, explicitly referring to “the *benefits* to those who have used the invention” (emphasis added).¹⁴⁹ The alleged infringer benefits from the data generated using the infringed patented technology to enable an eventual revenue stream. Factor eleven specifically looks at the “extent to which the infringer has made *use* of the invention” and “evidence probative of the *value of that use*” (emphasis added).¹⁵⁰ Finally, factor thirteen considers the “portion of the realizable profit that should be credited to the invention.”¹⁵¹

One potential detraction to a reach-through royalty is the argument that the tragedy of the anti-commons will deter development and innovation, as advanced in the biotechnology industry. However, such an argument is not obviously applicable in situations like *Software Rights Archive v. Google*,¹⁵² in which a single patentee is seeking to force Google to license its technology. In the typical anti-commons argument, the threat of under-utilization from intersecting spheres of intellectual property is not apparent outside of the biotechnology industries where economically profitable development may be dependent on licensing numerous technologies.¹⁵³ Further, the argument in the biotechnology context that a reach-through royalty is a form of patent misuse because it artificially lengthens the patent term of the research tool is not applicable in this context, as the infringing use is concurrent with the data generation.¹⁵⁴

¹⁴⁹ *Id.*

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² 2009 U.S. Dist. LEXIS 26640 (E.D. Tex. 2009) (No. 2:07-CV-511).

¹⁵³ See Heller & Eisenberg, *supra* note 140, at 699.

¹⁵⁴ See Bohannon, *supra* note 133, at 519 (stating that in the pharmaceutical context, there exists the risk that drugs developed using the patented research tool under a reach-through license, may owe royalties that extend past the patent term of the research tool,

Nonetheless, the argument of enabling the final saleable product remains the same even if the final product is itself not patentable, as will typically be the case in data generation products or services, unlike in the biotechnology industry where the final therapeutic product is itself often patentable.¹⁵⁵

Thus, a reasonable royalty based on a reach-through analogy seems justified in other technology areas as well. The requirements for applying such an analogy are: the creation of a direct-revenue producing product that uses patented technology in its creation, the lack of a revenue stream from direct use of the patented technology, and absence of the patented technology as an essential element of the direct-revenue producing product. Like biotechnology research tools, the patented technology involved in *Software Rights Archive v. Google* is not an essential part of the actual revenue-generating product. Therefore, the valuation of the patented technology and any damages the court awards should consider the use of the patented technology in this light.¹⁵⁶

despite the fact that the patented research tool is no longer in active use).

¹⁵⁵ See John M. Conley et al., *Myriad After Myriad: The Proprietary Data Dilemma*, 15 N.C. J.L. 597, 599–600 (2014); Karl F. Jorda, *Patent and Trade Secret Complementariness: An Unsuspected Synergy*, 48 WASHBURN L.J. 1, 13–14 (2008); Stimson, *supra* note 27.

¹⁵⁶ See *Integra Lifesciences I, Ltd. v. Merck KGaA*, 496 F.3d 1334, 1348 (Fed. Cir. 2007) (Rader, J., dissenting-in-part and concurring-in-part) (“In this case, two of the patents are research tools that deserve protection. This court should remand with instructions that the district court examine and protect these research tool patents.”); Henrik Holzapfel & Joshua D. Sarnoff, *A Cross-Atlantic Dialog on Experimental Use and Research Tools*, 48 IDEA 123, 218 (2008) (suggesting that compensation for infringement of a research tool should follow a liability rule invoked ex post as opposed to ex ante to better determine the value of the research tool with the benefit of hindsight bias); Joshua D. Sarnoff & Christopher M. Holman, *Recent*

Licensing agreements that follow this model in the electronic design automation space are typically a one-time or yearly licensing fee, not based on the value of the final products that used the tools.¹⁵⁷ For example, Synopsys licenses its electronic design automation tools to companies in the semiconductor chip business that design a variety of semiconductor chips for a wide range of functions from powering mobile telephones and routing internet packets to generic application processors.¹⁵⁸ These agreements

Developments Affecting the Enforcement, Procurement, and Licensing of Research Tool Patents, 23 BERKELEY TECH. L.J. 1299, 1358–59 (2008) (suggesting that a reach-through licensing agreement results in a profit to the licensor only if the research is actually used in the development of a saleable product); Wang, *supra* note 134, at 319; Ware, *supra* note 134, at 283 (arguing the justification for a reach-through royalty is stronger when the research tools provides a “novel means”).

¹⁵⁷ See *In re Cadence Design Sys., Sec. Litig.*, 654 F. Supp. 2d 1037, 1040 (N.D. Cal. 2009); *Rolex Emps. Ret. Trust v. Mentor Graphics Corp.*, 749 F. Supp. 1042, 1043 (D. Or. 1990); Shinae Kim-Helms, *Review of Key Clauses in University/Biotechnology Industry Licensing Agreements*, 42 LES NOUVELLES 371, 376-77 (2007); Jane L. Stratton, *Biotechnology Law Issues: Representing Commercial Biotechnology Companies in Licensing Negotiations*, 16 AIPLA Q.J. 506, 507, 510, 517 (1988); Rita Glover, *The Effect of EDA Licensing Model Shifts*, EDA TODAY (July 2001), <http://www.edat.com/NEA09a.htm> [<http://perma.cc/NJA4-QY6D>]; Wang, *supra* note 134, at 320 (discussing the possibility of lump-sum payments or milestone payments prior to using the technology). *But see* Michael S. Mireles, *An Examination of Patents, Licensing, Research Tools, and the Tragedy of the Anticommons in Biotechnology Innovation*, 38 U. MICH. J.L. REFORM 141, 165 (2004) (suggesting that the value of the right to use the research tool patent justifies the reach-through royalty tied to the value of the final commercial product); Mueller, *supra* note 133, at 54–55 (suggesting a liability rule for biotechnology products that infringe a research tool patent in their production to the final commercial value of the product).

¹⁵⁸ *Wu Group v. Synopsys, Inc.*, No. C 04-3580 MJJ, 2005 U.S. Dist. LEXIS 42351, at *2–3 (N.D. Cal. Aug. 10, 2005) (“Synopsys sells

typically are not directly dependent on the revenue stream of the products made from these tools.

These types of licensing agreements would be appropriate for comparison purposes to determine what a reasonable royalty would be for awarding damages to the plaintiff when a reach-through royalty is applicable. Synopsys and other electronic design automation companies are typically able to develop, market, and sell their tools to a large customer base and are not beholden to a single customer, similar to basic biotechnology tools that are able to license to a large number of pharmaceutical development companies.¹⁵⁹ In some circumstances, such a customer base may not exist, limiting the ability of the patent holders to monetize their patented technology. For example, patented technology in internet search may be limited in the number of possible licensees. However, this is a criticism of the result, not necessarily of the rationale. Google’s market dominance in internet search technology should not play a role in the reasonable royalty analysis stemming from liability due to patent infringement.

VII. CONCLUSION

Infringers of patented technology are in violation of the patent laws when they use a patented product or process even when that product or process produces no direct revenue. As such, to keep with the aims and purposes of the

three types of licenses for its EDA software: (1) technology subscription licenses (“TSLs”), which provide particular and unspecified future technology for a finite period; (2) perpetual licenses, which provide particular technology for as long as the customer renews maintenance (which is purchased separately) plus 20 years; and (3) term licenses, which provide particular technology for a finite period.”).

¹⁵⁹ *Wu Group*, 2005 U.S. Dist. LEXIS 42351, at *2–4.

patent laws, such behavior needs to be discouraged to maintain the proper incentives to promote the progress of science and innovation. However, excessive damages awards that more than adequately compensate the patentee may actually do more harm than good to the overall incentive structure of the patent system. A damages award must be cognizant of the value created or enabled by the patented technology and should operate as a deterrent. Technology that enables creation of saleable products is analogous to the basic research tools of the biotechnology industries. Valuing these patents in this manner and comparing licensing schemes that value the patented technology in a reach-through manner to the final product achieves an equitable result repairing the harm done to the patentee, while still maintaining the incentives of the patent system.

