



Damages for Infringement of Research Tool Patents: The Reasonableness of Reach Through Royalties

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1. INTRODUCTION

¶1 Research tools are the resources that scientists use to make discoveries. Modern medical technology would not have been possible without patented research tools such as the polymerase chain reaction (PCR), screening techniques for finding compounds useful for treating disease, and even the compounds themselves, which are research tools when they are candidates in tests that screen for therapeutic uses.¹ The objective of the patent system is to encourage innovation, but that objective is realized both by encouraging the development of research tools and by encouraging the use of those research tools. This paper discusses how courts' determinations of damages for infringement of research tool patents might influence the ways in which research tools are licensed and used.

¶2 The scientists who use research tools often view them differently than the people who developed them. To the users, they may be steps toward the invention of differently useful end products; to the developers, however, the tools themselves may be the end products of the invention process. As a result, some research tool patent holders seek royalties under their patent licenses that reach through their patent rights and attach to any discoveries made using the tools.² The existence of such license agreements might influence courts to thus award royalties that reach through to profits from discoveries made by infringing uses of patented research tools.³

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¹ WORKING GROUP ON RESEARCH TOOLS, NATIONAL INSTITUTES OF HEALTH (NIH), REPORT (June 4, 1998), available at <http://www.nih.gov/news/researchtools> (defining the term "research tool" broadly to include "cell lines, monoclonal antibodies, reagents, animal models, growth factors, combinatorial chemistry libraries, drugs and drug targets, clones and cloning tools (such as PCR), methods, laboratory equipment and machines, databases and computer software."). The NIH Working Group investigated difficulties encountered by NIH funded researchers as a result of patents claiming research tools.

² See Michael A. Heller & Rebecca S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698, 699 (May 1, 1998) (noting that the term "reach-through licenses" embraces a variety of situations ranging from assignments of all rights in subsequent discoveries to assignment of only limited rights such as rights to royalties on profits from subsequent discoveries).

³ See *SIBIA Neurosciences, Inc. v. Cadus Pharmaceutical Corp.*, No. 96-1231 (S.D. Cal. Feb. 26, 1999), *rev'd on other grounds*, 225 F.3d 1349 (Fed. Cir. 2000) (awarding \$18 million to a research tool patent holder as royalties on anticipated profits from

¶3 These court-awarded infringement damages are likely to have a significant influence on how the intellectual property rights from discoveries made using patented research tools will be assigned outside of any courtroom. This paper presents several issues that courts should consider when trying the damages portions of research tool patent infringement cases. It also provides an analysis of how the law of patent damages should apply to situations in which discoveries were made by infringing uses of research tools. The law of patent infringement damages is briefly reviewed as reflected by the patent statutes and relevant jurisprudence of the United States Supreme Court, the Court of Appeals for the Federal Circuit, and well-established precedent from other courts. Application of this law to examples of specific infringing acts against patents to specific types of research tools leads to conclusions about the different consequences of awarding reach through royalties for infringement of patents to different types of research tools.

¶4 This paper discusses two ways in which the objective of the patent system to encourage innovation can be advanced. The first way is to compensate patent holders for acts of infringement; the second is to prevent ownership of a single area of intellectual property by multiple individuals. Compensating patent holders for economic injuries they suffer due to infringement assures them their reward for innovation will be protected, and encourages them to take risks in innovation. Thus, discoveries made by infringing uses of patented research tools that infringers would have paid to use in anticipation of making those discoveries might entitle patent holders to damages awards that reach through to infringers' profits from the discoveries.

¶5 On the other hand, the creation of overlapping patent rights can lead to substantial obstructions to innovation and development in a particular area, which conflicts with the policy to encourage innovation. When infringing uses of research tools lead to profitable discoveries with newly created rights that overlap with the already extant rights to the research tools, damages awards including the newly created rights would not obstruct innovation, but instead would avoid the creation of an area of overlapping ownership within the intellectual property of the research tools patent holder. However, damages awards that include newly created rights to discoveries made by infringing uses where there are no areas of overlap between the newly created rights and the rights to the tools used to make the discoveries would discourage innovation because such damages would create an area of overlapping ownership in the newly created intellectual property.

2. DAMAGES FOR RESEARCH TOOL PATENT INFRINGEMENT

A. The Policies Behind Patent Infringement Damages Awards

¶6 The United States Constitution grants Congress the power to give exclusive rights to inventors for their discoveries.⁴ The purpose of this power is to encourage invention and disclosure;⁵ therefore, both legislative and judicial patent policies should be directed to achieving that purpose. The legislature has exercised its power by developing the patent system, governed by Title 35 of the United States Code. The factors controlling infringement damages awards are very fact-intensive, so the patent statutes give only broad guidance, requiring the judiciary to establish damages awards on a case-by-case basis.⁶ This is a practical necessity, despite the fact that damages are surely among the most important aspects of enforcing patent policy. Furthermore, like all factual inquiries,

discoveries made by an unlicensed defendant with the patented research tools).

⁴ U.S. CONST. art. I, § 8 ("The Congress shall have Power . . . [t]o promote the Progress of . . . useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their . . . Discoveries").

⁵ See *Fromson v. W. Litho Plate and Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988) (stating that the "patent system encourages inventors to invent and disclose.").

⁶ See *TWM Mfg. Co., Inc. v. Dura Corp.*, 789 F.2d 895, 899 (Fed. Cir. 1986) (stating that "[s]ection 284 does not mandate how the district court must compute [damages], only that the [award] compensate for the infringement.").

infringement damages determinations are reviewed under deferential standards.⁷ Federal district courts, and usually civil juries, are ultimately entrusted with the important task of awarding infringement damages.⁸

1. *Compensating for Damages Suffered by Aggrieved Patent Holders*

¶7 In 1964, the Supreme Court decided *Aro Manufacturing Co. v. Convertible Top Replacement Co.*,⁹ which was profoundly influential on infringement damage awards. Justices Stewart, White, and Goldberg joined Justice Brennan, who wrote Part IV of the *Aro* opinion; Justice Harlan did not join because he felt that the matters dealt with there were not yet ripe.¹⁰ This part of the opinion asserts that a 1946 amendment to 35 U.S.C. §284, the infringement compensation section of the patent statute, was intended to prevent patentees from recovering infringers' profits.¹¹ Part IV of the *Aro* opinion is controversial; it has been argued that infringers' profits should be recoverable under the broader meaning given by Congress to the term "damages" in the patent statutes.¹² Nonetheless, courts have not awarded infringers' profits since *Aro*.¹³

¶8 Courts now treat patent infringement damages like other tort damages under the common law: patentees may recover to the extent they are injured by infringers' acts.¹⁴ According to 35 U.S.C. §

⁷ See *Cybor Corp. v. FAS Technologies, Inc.*, 138 F.3d 1448, 1461 (Fed. Cir. 1998) (*en banc*) (affirming a district court's damages award and explaining the standard of appellate review: "The amount of damages determined by a district court is a question of fact that is reviewed for clear error on appeal, while the method used by a district court in reaching that determination is reviewed for an abuse of discretion.").

⁸ See *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd.*, 72 F.3d 857, 866-67 (Fed. Cir. 1995), *vacated on other grounds and remanded*, 520 U.S. 1111 (1997), *different results reached at* 234 F.3d 558 (Fed. Cir. 2000) (*en banc*), *vacated and remanded*, 535 U.S. 722 (2002) (stating that the "assessment of damages is a question of fact, and is decided by the jury when trial is to a jury. ... The jury's award must be upheld unless the amount is grossly excessive, clearly not supported by the evidence, or based on speculation or guesswork.").

⁹ 377 U.S. 476 (1964). The primary holding of the case concerned repair-versus-reconstruction in the context of contributory infringement; this issue had been left undecided in an earlier related case, *Aro Manufacturing Co. v. Convertible Top Replacement Co.*, 365 U.S. 336 (1961).

¹⁰ *Aro*, 377 U.S. at 502 n.18.

¹¹ *Id.* at 505 (plurality opinion) (stating that the "purpose of the change was precisely to eliminate the recovery of profits as such and allow recovery of damages only."). See Act of Aug. 1, 1946, ch. 726, § 1, 60 Stat. 778 (codified at 35 U.S.C. § 284 (2002)). Before the 1999 amendment forbidding increased damages for infringement of a newly created provisional right (Act of Nov. 29, 1999, Pub. L. No. 106-113), the 1946 Act was the most recent amendment to the patent infringement compensation statute. 35 U.S.C. § 284 (2002).

¹² Part IV of the *Aro* opinion quotes from the legislative history to justify the statement that recovery of infringers' profits was eliminated by the Act of 1946: "The object of the bill is to make the basis of recovery in patent-infringement suits general damages, that is, any damages the complainant can prove, not less than a reasonable royalty, together with interest from the time infringement occurred, rather than profits and damages." *Aro*, 377 U.S. at 505-06 (citing H.R. REP. NO. 79-1587, at 1 (1946); S. REP. NO. 79-1503, at 2 (1946)). Yet, Vincent Tassinari's examination of the legislative history shows that the *Aro* interpretation is suspect. Vincent P. Tassinari, *Patent Compensation Under 35 U.S.C. 284*, 5 J. INTELL. PROP. L. 59 (1997). He argues that the legislature intended only to do away with dual recovery of infringers' profits and patentees' damages, and intended to allow recovery for "general damages," which meant any type of damages patentees could prove, including infringers' profits. *Id.* at 84-119. The legislative history is clear that the principal purpose of the amendment was to allow (but not necessarily to require) patentees to forego estimations of infringers' profits, the calculation of which had required decades of proceedings in some instances. *Id.* at 108-09 (noting that the Senate was "showing its collective concern for the plight of a claimant [previously] required by the law to prove the infringer's profits" which almost always resulted in "an interminable delay" before recovery). See also Vincent P. Tassinari, *Compiled Legislative History of 35 U.S.C. § 284: The Patent Compensation Statute*, 31 UWLA L. REV. 45 (2000) (reproducing relevant excerpts from the legislative history of 35 U.S.C. §284). In fact, the House Committee on Patents noted that "the bill would not preclude the recovery of profits as an element of general damages" a mere three paragraphs after the portion quoted in *Aro*. H.R. REP. NO. 79-1587, at 2 (1946).

¹³ See, e.g., *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1442 (Fed. Cir. 1998) (stating that *Aro* clarified "a purported ambiguity" in § 284 by interpreting it "as meaning that only the patentee's losses can be recovered, 'without regard to the question whether the defendant has gained or lost by his unlawful acts.'" (citation omitted)).

¹⁴ See, e.g., *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 1579 (Fed. Cir. 1992) (stating that "[i]n patent cases, as in other commercial torts, damages are measured by inquiring: had the tortfeasor not committed the wrong, what would

284, a patent holder is entitled to "damages adequate to compensate for the infringement but in no event less than a reasonable royalty for the [infringing] use" upon a finding of liability.¹⁵ The Federal Circuit has interpreted this statute as calling for damage awards partitioned between the lost profits caused by the infringing acts and a reasonable royalty when a patentee cannot sufficiently prove lost profits;¹⁶ but patentees may not recover infringers' profits *per se*.¹⁷

¶9 Section 284 also provides for increased damages "up to three times the amount found,"¹⁸ but treble damages are awarded only under the exceptional circumstances of willful infringement or bad faith litigation.¹⁹ The increased damages provision discourages willful infringement,²⁰ thus strengthening patent rights by encouraging potential infringers to seek counsel as to whether they are indeed infringers.²¹ In contrast, courts have refused to punish accidental infringers with treble damages, using the rationale that increased damages would not deter infringers who do not know they are infringing.²²

a. Lost Profits

¶10 One way a patentee can prove that an infringing act caused lost profits is to provide convincing evidence regarding four elements set forth in *Panduit Corp. v. Stablin Brothers Fibre Works, Inc.*²³ To recover lost profits under the *Panduit* test, a patent holder must show a demand for the infringed product, a lack of non-infringing substitutes, a capability of exploiting the demand for the product, and that lost profits are quantifiable.²⁴ Courts often apply the *Panduit* test with few modifications,²⁵ but it is not the only way for patent holders to establish entitlement to lost profits; for example, profits lost as a result of lost market share have been held to be recoverable.²⁶

have been the financial position of the person wronged?").

¹⁵ 35 U.S.C. § 284 (2000).

¹⁶ *See, e.g., State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1577 (Fed. Cir. 1989) (stating that "the award may be split between lost profits as actual damages to the extent they are proven and a reasonable royalty for the remainder.").

¹⁷ *See, e.g., Nike*, 138 F.3d at 1442.

¹⁸ 35 U.S.C. § 284 (2002).

¹⁹ *See, e.g., Beatrice Foods Co. v. New England Printing and Lithographing Co.*, 923 F.2d 1576, 1579 (Fed. Cir. 1991) (stating that "enhanced damages may be awarded only as a penalty for an infringer's increased culpability, namely willful infringement or bad faith.").

²⁰ *See, e.g., Electro Med. Sys., S.A. v. Cooper Life Scis., Inc.*, 34 F.3d 1048, 1057 (Fed. Cir. 1994) (reversing a judgment of willfulness where the infringer had a reasonable basis to believe its actions did not infringe).

²¹ *See, e.g., Underwater Devices, Inc. v. Morrison-Knudsen Co., Inc.*, 717 F.2d 1380, 1389 (Fed. Cir. 1983) (holding that "[w]here, as here, a potential infringer has actual notice of another's patent rights, he has an affirmative duty to exercise due care to determine whether or not he is infringing.").

²² *See, e.g., Gustafson, Inc. v. Intersystems Indus. Prods., Inc.*, 897 F.2d 508, 511 (Fed. Cir. 1990) (holding that "a party cannot be found to have 'willfully' infringed a patent of which the party had no knowledge."); *Jurgens v. McKasy*, 927 F.2d 1552, 1562 (Fed. Cir. 1991) (upholding a district court's increased damages judgment, but noting in dicta that seeking advice of counsel before the infringing act is only possible when an infringer knows of the patent before it begins infringing).

²³ 575 F.2d 1152, 1156 (6th Cir. 1978) (holding that lost profits awards are contingent on proof that they were caused by acts of infringement).

²⁴ *Id.*

²⁵ *See Kearns v. Chrysler Corp.*, 32 F.3d 1541, 1551 (Fed. Cir. 1994), *cert. denied*, 514 U.S. 1032 (1995) (stating that "one way to establish 'but for' causation is to meet the four-part test pronounced in *Panduit* . . .").

²⁶ *See State Indus. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1578 (Fed. Cir. 1989) (upholding a judgment awarding a patentee lost profits based on evidence that the patentee's lost market share was caused by an act of infringement); *Cf. Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1538, 1546-1550 (Fed. Cir. 1995) (en banc) (upholding a judgment awarding lost profits from lost sales of unpatented products that competed in the same market with infringing products, but reversing a lost profits award for lost sales of unpatented products that had no functional relationship to the patented invention). *But see BIC Leisure Prods. v. Windsurfing Int'l, Inc.*, 1 F.3d 1214 (Fed. Cir. 1993) (reversing a judgment awarding a patent holder lost profits because the market for the

¶11 The purpose of the *Panduit* and other tests is to require patent holders to demonstrate with reasonable certainty that any lost profits suffered actually resulted from acts of infringement in order to recover those lost profits from infringers. The judiciary has fashioned tests that are substantially the same as those used under the common law of torts, wherein plaintiffs must prove that their injuries were proximately caused by a defendant's negligent actions.²⁷ Thus, a patent holder's lost profits must be a reasonably foreseeable effect of an infringer's actions in order to be recoverable.²⁸

b. Reasonable Royalties

¶12 Patentees are entitled to reasonable royalties for any acts of infringement that they cannot prove caused them direct pecuniary harm. In this regard, patent damages law departs from the common law of torts, in which a failure to prove that a tortfeasor's actions were the proximate cause of an injury would bar recovery. But the departure is not substantive, for any loss of royalties by a patent holder due to an infringer's failure to take a license would be a foreseeable result of infringing. Thus there is a statutory, irrebuttable presumption that patent holders are damaged at least to the extent of royalties lost from an infringer's failure to take a license.²⁹

¶13 Patentees who license their patents to many willing licensees establish a royalty under their patents that courts should usually apply unaltered to infringers.³⁰ But, absent established royalties, courts should determine what royalties are reasonable based on hypothetical pre-infringement licensing negotiations between patentees and infringers, i.e., what the parties would have agreed to had they willingly negotiated licenses that covered the infringing acts.³¹

2. Anticommons

¶14 A "tragedy of the commons" results when shared resources are overused and depleted because the individuals sharing the resources attempt to maximize their shares.³² A tragedy of the commons can arise when all who share a resource have an unlimited right to use that resource. A related phenomenon can arise when multiple individuals share the right to exclude others from using a resource, but with the opposite results. In this case the tragedy is not the overutilization and depletion of a resource, but the underdevelopment of a resource when, in order to protect their shares of that resource, individuals exercise their rights to exclude one other. This phenomenon has been called "the tragedy of the anticommons."³³

¶15 The patent statutes assign attributes of personal property to patents,³⁴ and the rights accompanying a patent thus include the right to exclude others from practicing the invention claimed

infringing products was independent of the market for the patent holder's products).

²⁷ See *Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1538, 1546 (Fed. Cir. 1995) (stating that recovery for lost sales, when they are foreseeable, is "well within the traditional meaning of proximate cause.").

²⁸ *Id.* (stating that "the reasonable limits of liability encompassed by general principles of law can best be viewed in terms of reasonable, objective foreseeability.").

²⁹ 35 U.S.C. § 284 (2000).

³⁰ See, e.g., *Nickson Indus., Inc. v. Rol Mfg. Co., Ltd.*, 847 F.2d 795, 798 (Fed. Cir. 1988) (explaining that "[w]here an established royalty exists, it will usually be the best measure of what is a 'reasonable' royalty.").

³¹ See, e.g., *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1579 (Fed. Cir. 1996) (explaining that absent evidence of established royalties, "this court accepts evidence about hypothetical results of hypothetical negotiations between the patentee and infringer (both hypothetically willing) at the time infringement began.").

³² Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968) (describing how common ownership of a resource can result in its overutilization).

³³ See, e.g., *Heller & Eisenberg*, *supra* note 2, at 699 (describing how both multiple patents covering the same subject matter and reach through license agreements can lead to tragedies of the anticommons, thus impeding the progress of scientific research).

³⁴ 35 U.S.C. § 261 (2002).

in the patent.³⁵ Consequently, patent policy should favor common ownership of patents that cover overlapping subject matter. If the right to exclude from an area of intellectual property was shared, then no one would be free to practice in that area, and any third party wishing to do so would have to be licensed by all those who share the right to exclude.³⁶ The legal obstacles to development would deprive that area of its appeal as an object of research, and it would remain undeveloped if the separate owners could not agree on license terms. The immediate effects of the anticommons problem are clearly contrary to the patent system objective of encouraging innovation. In the long term, multiple owners of patent rights to the same area of intellectual property may or may not agree on mutual licensing arrangements that allow for development of that area.³⁷

¶16 Reach through royalties also have anticommons effects when awarded for infringing acts that lead to patentable discoveries. Such awards discourage infringers/discoverers from developing their discoveries while allowing them to apply for patent rights that exclude others from developing those discoveries. Thus, to the extent that it would further the objective of encouraging innovation,³⁸ courts should consider enforcing a policy against anticommons effects when deciding what appropriate infringement awards should be.

3. *Arguments For and Against Reach Through Royalties*

¶17 Some argue that the infringement compensation statute does not adequately compensate aggrieved patent holders with claims to screening tools—research tools used largely or solely in finding other useful compounds.³⁹ The argument is that patentees could have negotiated licenses under which they would have received interests in any subsequent discoveries before any infringing acts; therefore, it is reasonable to award royalties damages on profits from such infringing discoveries.⁴⁰

¶18 Judicially created patent laws forbid recovery of infringers' profits *per se*, so patentees who cannot prove that they would have made and profited from the same discoveries may not recover profits they alleged to have lost as a result of an infringer's discoveries.⁴¹ However, a patentee's injuries

³⁵ 35 U.S.C. § 154 (2002) ("Every patent shall contain . . . a grant to the patentee . . . of the right to exclude others from making, using, offering for sale, . . . selling . . . or importing the invention into the United States, and, if the invention is a process, of the right to exclude others from using, offering for sale[,] . . . selling . . . , or importing . . . products made by that process . . .").

³⁶ See also *In re Longi*, 759 F.2d 887, 894 (Fed. Cir. 1985) (explaining that "a common assignee is entitled to proceed with a terminal disclaimer to overcome a rejection based on double patenting of the obviousness type."); *Cf.* 37 C.F.R. § 1.321(c)(3) (2002) (requiring that a terminal disclaimer filed to overcome the judicially created double patenting rejection of a patent application include "a provision that any patent granted on that application . . . shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection."). *But see* *King Instruments Corp. v. Perego*, 65 F.3d 941, 951-52 (Fed. Cir. 1995) (accepting situations in which the subject matter of a patent is not developed during its term because that is a recognized possible consequence of the limited monopoly granted to inventors for disclosing their inventions within the patent system).

³⁷ See *Heller & Eisenberg*, *Anticommons*, *supra* note 2, at 700 (noting the possibility that anticommons effects in biotechnology might naturally dissipate as a result of bundled licensing agreements that could evolve if groups of owners of related intellectual property make private arrangements in order to reduce transaction costs of developing multiply owned intellectual property).

³⁸ *Fromson v. Western Litho Plate and Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988) (stating that the "patent system encourages inventors to invent and disclose").

³⁹ See James Gregory Cullem, *Panning for Biotechnology Gold: Reach-Through Royalty Damage Awards for Infringing Uses of Patented Molecular Sieves*, 39 IDEA 553, 557 (1999) (asserting that the failure to provide adequate awards for screening tools "is especially apparent when the technology has greater value in what it does than what it is . . .").

⁴⁰ See *id.* at 561 (arguing that because patentees might have had reach through royalties under licenses, they should have reach through royalties damages).

⁴¹ See *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 507 (1964) (citing *Coupe v. Royer*, 155 U.S. 565, 582 (1895) (establishing "the measure of recovery in [patent infringement] cases [is] not what the defendant has gained, but what plaintiff has lost."); *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1442 (Fed. Cir. 1998). *But see* *King Instruments Corp. v. Perego*, 65 F.3d 941, 951 (Fed. Cir. 1995) (affirming a lost profits award even though the patentee did not make the patented invention).

would extend to royalties that the patentee lost as a result of an infringer's failure to take a license.⁴² The full value of screening tools to infringers would be assessed if reach through royalties are awarded for acts of infringement that lead to profitable discoveries, but not if recovery is based solely on profits derived from continuing infringement.⁴³ Courts have recognized that infringers' actual profits from infringing are highly relevant to the determination of what reasonable royalties should be.⁴⁴ Courts have further recognized that even profits that do not result directly from the sale of patented products may still be relevant to determining what a reasonable royalty should be.⁴⁵ Infringers' actual profits from infringing acts are clearly relevant to determining what profits they might have anticipated and what they would have agreed to pay to use the invention, and thus to calculating what patent holders lost as a result of infringers' failure to take licenses.

¶19 But a policy against anticommons would not be advanced by awarding royalties on profits from discoveries made with screening tools if there was no area of overlapping intellectual property between the tools that allowed the discoveries and the discoveries themselves. Furthermore, patentees who require royalties on profits from discoveries made under licenses to their patented screening tools are claiming royalties based on non-infringing activities, such as sales of unpatented compounds whose utilities were revealed by the patented screening tools. Licenses that include royalties terms based on sales or use of unpatented items may be reasonable if the parties agree to them as a matter of convenience,⁴⁶ but patentees who unilaterally assert such terms with anticompetitive effects risk rendering their patents unenforceable for misuse.⁴⁷

B. *The Relationship Between Infringing Activities and Damages Awards*

¶20 A patent is infringed when the patented invention is made, used, offered for sale, sold, or imported without authorization.⁴⁸ The infringement statute further provides that actively inducing infringement creates liability,⁴⁹ and that selling and importing part of a patented invention with the knowledge that the part is intended for an infringing use are also infringing acts.⁵⁰ The damages statute ties infringing activities to the damages those activities cause.⁵¹ Thus, a finding of infringement leads to additional inquiries: a court must further determine exactly what infringing acts

⁴² Cullem, *supra* note 39, at 561.

⁴³ Cullem, *supra* note 39, at 562 (observing that in biotechnology "reach-through royalties allocate value to nascent research tools . . .").

⁴⁴ See *Fromson v. Western Litho Plate and Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988) (citing *Simclair Ref. Co. v. Jenkins Petroleum Co.*, 289 U.S. 689, 698-99 (1933) for the rule that evidence of an infringer's actual profits from the infringement, if available, is a "book of wisdom that courts may not neglect.").

⁴⁵ See *Trans-World Mfg. Corp. v. Al Nyman & Sons, Inc.*, 750 F.2d 1552, 1568 (Fed. Cir. 1984) (reversing the trial court's exclusion of evidence of the infringer's profits from sales of an unpatented article using a patented display rack).

⁴⁶ See *Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 1398, 1408-09 (Fed. Cir. 1996) (holding that a patentee did not misuse a patent by requiring royalties on sales of unpatented components under a license to the patent because the parties agreed to the terms as a matter of convenience, and the licensee was not coerced into taking a license).

⁴⁷ See generally, *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1372-73 (Fed. Cir. 1998) (explaining that patent misuse claims may arise when a patentee has "impos[ed] conditions that derive their force from the patent, [and] the patentee has impermissibly broadened the scope of the patent grant with anticompetitive effect," that "a holding of misuse renders the patent unenforceable until the misuse is purged," and that "extended royalty terms" are among "the classic grounds of patent misuse."); *B. Braun Med. Inc. v. Abbott Labs.*, 124 F.3d 1419, 1426 (Fed. Cir. 1997) (explaining that "the key inquiry under [the] fact-intensive [patent misuse] doctrine is whether, by imposing the condition, the patentee has 'impermissibly broadened the 'physical or temporal scope' of the patent grant with anticompetitive effects'" (citations omitted)).

⁴⁸ 35 U.S.C. § 271(a) (2002).

⁴⁹ 35 U.S.C. § 271(b) (2002).

⁵⁰ 35 U.S.C. § 271(c) (2002).

⁵¹ 35 U.S.C. § 284 (2002).

were committed and the extent of the aggrieved patent holder's injuries caused by those infringing acts, as infringement awards should not exceed compensation for the damage caused by those acts.⁵²

¶21 The scope of infringing activities set forth by the patent statutes includes a number of different activities that might involve research tool patents. For example, the polymerase chain reaction (PCR) patents could be infringed by a manufacturer who sells products for use in the patented method, or by a researcher who performs the method using unlicensed products.⁵³ The PCR method's range of applications is broad due to its ability to copy almost any genetic material; it is not limited by the primary structures of the substrates on which it acts. Use of the PCR method is ubiquitous in biotechnology research. Roche and Perkin-Elmer hold patent rights covering various PCR methods, and in order to profit from those rights, they license their use to anyone who buys the products needed to perform derivative methods (e.g., thermocyclers, reagents, enzymes, etc.).⁵⁴

¶22 Although it is not an infringing act to import or sell staple articles or commercial commodities suitable for substantial noninfringing use, selling a material or apparatus whose only substantial use is in infringing activity creates liability.⁵⁵ Therefore, a manufacturer who provides an enzyme needed for PCR, but not for other processes, would risk liability if not licensed under the PCR patents. If the PCR patent holders could not prove lost profits, then an infringing manufacturer would risk liability for a reasonable royalty based on the infringer's sales of the infringing product.⁵⁶

3. REASONABLE ROYALTIES AS THE MEASURE OF DAMAGES FOR RESEARCH TOOL PATENT INFRINGEMENT

A. Reasonable Royalties Generally

¶23 Reasonable royalties are patent infringement awards to which patent holders are entitled to compensate for acts of infringement that they cannot prove caused lost profits.⁵⁷ To put them in the position they would have been had there been no infringement,⁵⁸ aggrieved patent holders should receive, at a minimum, the benefits they would have realized if the infringers had taken licenses. Patent trial courts can benefit from the guidance of a fellow district court in *Georgia-Pacific Corp. v. United States Plywood Corp.*,⁵⁹ which reviewed fifteen classic factors that trial courts may use to calculate reasonable royalties.⁶⁰ A key factor in determining reasonable royalties should be the

⁵² 35 U.S.C. § 284 (2002) (designating only "damages adequate to compensate for the infringement" and a "reasonable royalty for the use made of the invention" (emphasis added)); *Fromson v. W. Litho Plate & Supply Co.*, 853 F.2d 1568, 1574 (Fed. Cir. 1988) (stating that a reasonable royalty "calculation is not a mere academic exercise in setting some percentage figure as a 'royalty'").

⁵³ PCR is a patented method for generating many identical copies of genetic materials. See U.S. Patent Nos. 4,683,195 and 4,683,202 (issued July 28, 1987).

⁵⁴ Shane Beck, *Do You Have a License?: Products Licensed for PCR in Research Applications*, THE SCIENTIST June 8, 1998, at 21 (explaining the legal significance of using particular products for PCR in research, and reviewing the legal battles involving the PCR patents).

⁵⁵ 35 U.S.C. § 271(c) (2002).

⁵⁶ 35 U.S.C. § 284 (2002).

⁵⁷ *Panduit Corp. v. Stahl Bros. Fibre Works, Inc.*, 575 F.2d 1152, 1157 (6th Cir. 1978) (holding that a patentee must prove causation in order to recover lost profits); 35 U.S.C. § 284 (2002) (requiring that awards for a successful claimant shall be "in no event less than a reasonable royalty").

⁵⁸ *Fromson v. W. Litho Plate and Supply Co.*, 853 F.2d 1568, 1574 (Fed. Cir. 1988) (citing Supreme Court precedent for the rule of law that patent damages should put patent holders in the position they would have been in had there been no infringement).

⁵⁹ *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971).

⁶⁰ The *Georgia-Pacific* factors may be broadly classified into factors relating to the market for the patented invention and factors relating to the profitability that the licensee would anticipate under the license. See 7 DONALD S. CHISUM, CHISUM ON

royalties paid by many third party licensees under the infringed patent if it happens to be extensively licensed, because any established royalties would most likely have been what the infringer would have had to pay to use the invention.⁶¹

¶24

The last but most important *Georgia-Pacific* factor casts the entire reasonable royalty inquiry in terms of a hypothetical license negotiation at the time the infringing acts began, had both parties negotiated willingly.⁶² While patent trial courts are generally given discretion in deciding how to determine reasonable royalties,⁶³ in the absence of established royalties, this pre-infringement hypothetical negotiation has been held to be a required element of the inquiry.⁶⁴ Thus, in spite of the recognized difficulties inherent to these estimations,⁶⁵ in order to accept expert testimony as to what terms the parties would have agreed on, that testimony must relate to what they would have agreed on at the time infringement began.⁶⁶ Reasonable royalties need not be based on actual infringing uses, or even how much infringers profited from their infringing uses, but may be based on other factors (such as cost savings to infringers) that the parties would have considered at the time of the hypothetical negotiation.⁶⁷

PATENTS § 20.03[3][b] (2001). The first of three classes of market factors relates to party-specific inquiries: the licensor's licensing policy and a hypothetical pre-infringement negotiation between the parties in the context of their commercial relationship. *Georgia-Pacific*, 318 F. Supp. at 1120 (factors 4, 5, and 15). The second class of market factors is specific to the terms of the hypothetical license: the nature, scope, and duration of the license. *Id.* (factors 3 and 7). The third class of market factors accounts for some general market considerations: established royalties, the rates paid by the infringer under licenses to comparable patents, and the market rates for use of comparable inventions. *Id.* (factors 1, 2, and 12).

There are two closely related classes of anticipated profitability factors that probe the value of the invention and the value of the infringing acts. The factors weighed in determining the value of the invention are the utility and advantages of the invention over available alternatives, and the nature of the invention. *Id.* (factors 9 and 10). The factors weighed in determining the economic benefit of the infringement are the additional profitability of conveyed sales, the extent and value of the infringing use, the infringer's established profitability, and the portion of the infringer's profit creditable to the invention rather than the infringer's own work. *Id.* (factors 6, 11, 8, and 13).

⁶¹ *See id.*

⁶² *Id.* The court recognized that the hypothetical licensee in this transaction would not take a license if the royalty were to exceed projected profits. *See also Panduit*, 575 F.2d at 1158. *But see* CHISUM, *supra* note 60, § 20.03[3][a]. Chisum describes a debate over whether the measure of damages should include more than the reasonable royalty two hypothetically willing parties would have agreed to before the infringement began. The Federal Circuit has indicated that such extra awards, distinct from enhanced damages and attorney fees, may be acceptable when "necessary to adequately compensate the patentee based on other relevant factors." *Maxwell v. J. Baker, Inc.*, 86 F.3d 1098, 1110 (Fed. Cir. 1996). One justification for these extra awards is that when the patent holder cannot prove lost profits in excess of a reasonable royalty, there is an incentive to infringe because "the infringer would have nothing to lose, and everything to gain if he could count on paying only the normal, routine royalty non-infringers might have paid." *Panduit*, 575 F.2d at 1158. Of course, as discussed *supra* notes 20-22 and accompanying text, judicial policies do not permit punishing unknowing infringers, but willful infringement can result in enhanced damages and attorney fees. 35 U.S.C. §§ 284-285 (2002).

⁶³ *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1461 (Fed. Cir. 1998) (*en banc*) (explaining that appellate courts review the methodology used by district courts in determining damages for abuses of discretion).

⁶⁴ *See Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1079 (Fed. Cir. 1983) (holding that "[s]ince there was no established royalty for licensing the Hanson patent, the magistrate necessarily had to use 'a willing-buyer/willing-seller concept, in which a suppositious meeting between the patent owner and the prospective [user] of the infringing [method] is held to negotiate a license agreement'" (alteration in original) (emphasis added) (citing *Tektronix, Inc. v. United States*, 552 F.2d 343, 349 (Ct. Cl. 1977)).

⁶⁵ *See Fromson v. W. Litho Plate and Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988) (characterizing the task of calculating reasonable royalties thus: "Determining a fair and reasonable royalty is often . . . a difficult judicial chore, seeming often to involve more the talents of a conjurer than those of a judge. . . . The methodology encompasses fantasy and flexibility; fantasy because it requires a court to imagine what warring parties would have agreed to as willing negotiators; flexibility because it speaks of negotiations as of the time infringement began, yet permits and often requires a court to look to events and facts that occurred thereafter and that could not have been known to or predicted by the hypothesized negotiators.").

⁶⁶ *See Unisplay, S.A. v. American Elec. Sign Co., Inc.*, 69 F.3d 512, 518 (Fed. Cir. 1995) (reducing the amount of the reasonable royalty found by the jury because the only evidence supporting the award was the plaintiff's expert's testimony about license agreements that were not purported to be hypothetical pre-infringement agreements).

⁶⁷ *Hanson*, 718 F.2d at 1080-81.

B. Reasonable Royalties for Infringement of Research Tool Patents

1. Reasonable Royalties for Infringement of Patents to Research Tools with Broad Ranges of Use

¶25 Reasonable royalties can sometimes be the appropriate measure of damages for infringement of patents to research tools with broad ranges of use. For example, if the assignees of the PCR patents did not supply the materials needed to perform the PCR method, then infringing sales of the materials would not result in any lost profits. The assignees then could only recover reasonable royalties on the infringers' sales. Further, if licenses to sell materials for practicing the PCR methods were common, then reasonable royalties for compensation of the infringing sales should be the established royalties under the established license.

¶26 PCR was clearly a great and important invention, yet it is a relatively simple method, and a very easy to infringe by using products not licensed by the patentees.⁶⁸ But unlicensed researchers who use PCR to make profitable discoveries should not have to pay royalties to the patent holders on the basis of the researchers' profits from the discovery. Such awards would not further the policy of compensation because the patentees would not have been injured by the infringing acts to the extent those awards would provide. The outcome of a hypothetical license negotiation, had the infringer taken a license instead of infringing, would surely have produced a license with the same terms as the many other well established PCR licenses. Nor would such an award further a policy against anticommons because the intellectual property created by discoveries made with broad range research tools such as PCR would not overlap with the already existing claims to the tools used to make those discoveries.

2. Reasonable Royalties for Infringement of Patents to Research Tools with Narrow Ranges of Use

¶27 While some research tools such as PCR have broad ranges of use, other research tools have uses that are much more limited. For example, therapeutic drugs are typically molecules whose structures enable them to activate or suppress physiological responses that are linked to disease. The utilities of these molecules are limited by their structures: a slight structural change in a molecule that is an effective drug can result in a molecule that completely lacks efficacy. Thus, the ranges of use of specific compounds as research tool targets for drug testing are actually quite limited when compared to the ranges of use of broad range research tools such as the PCR method, which operates on any genetic materials with arbitrary primary structures.

¶28 Many companies maintain large libraries of proteins, genetic fragments, and smaller organic molecules that may have therapeutic activities, or may lead to other compounds that do. Each of these molecules is a test compound that, upon testing, may reveal a primary hit, which would then require further testing to confirm therapeutic utility. Corporate assignees of patents to compounds wanting to know if their patented compounds have particular utilities may engage researchers to test the compounds. Some assignees may reserve for themselves all rights to any new uses for their patented compounds that might be discovered by the researchers, but other assignees may agree to share profits from any subsequently discovered uses with the researchers in exchange for a reduction in consideration for testing the compounds.

¶29 An unlicensed researcher who tests a patented compound also might discover a new profitable therapeutic use and apply for a patent on that new use.⁶⁹ Although the discovery would not have been possible but for the act of infringement, patent damages law does not allow the patent holder to recover the infringer's profits from the discovery.⁷⁰ Nevertheless, the infringer's profits from the

⁶⁸ Kary Mullis won the Nobel Prize for chemistry in 1993 for inventing PCR. See Beck, *supra* note 54, at 21.

⁶⁹ Cf. Cooper v. Goldfarb, 240 F.3d 1378 (Fed. Cir. 2001) (affirming a decision by the Patent and Trademark Office Board of Patent Appeals and Interferences awarding Goldfarb priority of invention for the use of a product developed by Cooper, even though Cooper had provided Goldfarb with a sample of the product intending Goldfarb to test it for the use at issue).

⁷⁰ See Nike, Inc. v. Wal-Mart Stores, Inc., 138 F.3d 1437, 1442 (Fed. Cir. 1998).

discovery should be relevant in determining what terms the patentee and infringer would have agreed to for a license that covered the infringing act, even if the infringer's profits were not derived from sales of a patented product.⁷¹

¶30 A policy against anticommons would call for more than a mere royalty on profits made from a new use of a patented compound, if the new use was discovered by an infringing use of the patented compound and the new use was subsequently patented. In order to allow unhindered access to develop the new use, at least one party must have the right to use the compound generally, as well as the right to the new specific use of the compound. The right to exclude from general use of the compound already belonged to the compound patent holder, so one possible proprietary distribution would allow the patent holder freedom to practice the newly discovered use, but leave the infringer/discoverer with the sole right to license the new use to third parties. This solution is equivalent to a non-exclusive license to the compound patent holder, who would be free to develop the new use of the compound. Provided that the compound patent holder would be willing to license the rights to general use of the compound, the infringer might even benefit from the discovery through third party licenses to the new use. Such a result would further the patent policy of encouraging activities such as testing compounds for new therapeutic uses.

3. Reasonable Royalties for Infringement of Patents to Research Tools with Intermediate Ranges of Use:

SIBLA Neurosciences v. Cadus Pharmaceutical

¶31 SIBIA Neurosciences is the assignee of a patent to methods of screening compounds for particular uses.⁷² The claimed methods involve screening compounds with cells that express cell surface proteins, which in turn are linked to reporter genes. When a compound activates a cell surface protein, expression of the reporter gene is triggered. These methods provide a first screen, identifying compounds as primary hits that should be tested further to determine whether they might be useful as drugs.

¶32 SIBIA sued Cadus for infringing its patent by using the patented screening methods. The district court awarded SIBIA an \$18 million reasonable royalty for Cadus' infringing action, and denied Cadus' motions for judgment as a matter of law and for a new trial.⁷³ Cadus then appealed to the Court of Appeals for the Federal Circuit. The Federal Circuit ultimately held SIBIA's patent invalid for obviousness, citing a single reference that disclosed the cells used in SIBIA's claimed methods, and concluding that general knowledge in the art provided the motivation to modify the reference and use the prior art cells in the methods claimed in SIBIA's patent.⁷⁴

¶33 Because the suit was decided on appeal on the issue of validity, the Federal Circuit did not address the issue of whether the \$18 million royalty was reasonable. The final example presented in this paper is an analysis of the SIBIA royalty award, to illustrate calculations of reasonable royalties as compensation for infringement of research tool patents.

a. The Facts Behind the Damages Issues in SIBIA

¶34 At trial, SIBIA's expert testified to a hypothetical license agreement with payment terms approximately equal to the damages that the jury later awarded, but Cadus argued on appeal that half

⁷¹ Cf. *Trans-World Mfg. Corp. v. Al Nyman & Sons, Inc.*, 750 F.2d 1552, 1568 (Fed. Cir. 1984) (reversing the trial court's exclusion of evidence of an infringer's profits from sales of an unpatented article using a patented sales rack in determining a reasonable royalty).

⁷² See *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1352 (Fed. Cir. 2000) (*SIBLA II*) (reversing the trial court judgment awarding SIBIA \$18M infringement damages on the grounds that the patent was invalid for obviousness). The patent at issue, U.S. Patent No. 5,401,629 (issued Mar. 28, 1995), claims a "method for identifying compounds that modulate cell surface protein-mediated activity".

⁷³ *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, No. 96-1231 (S.D. Cal. Feb. 26, 1999) (*SIBLA I*) (order denying Cadus' motion for judgment as a matter of law and motion for a new trial).

⁷⁴ *SIBLA II*, 225 F.3d at 1356-57.

of the award set forth by SIBIA's expert was based on overly speculative estimates of the benefits Cadus would have realized from primary hits found using the patented method.⁷⁵ SIBIA's expert set forth the following four royalty components to the hypothetical license that he opined the parties would have agreed to:⁷⁶

- (a) \$5 million Up front licensing fee,
- (b) \$1.6 million 4% equity stake in Cadus as of March 1995,
- (c) \$3 million Milestone payments for 30 targets supposedly delivered to Cadus' corporate partners between March, 1995 and December, 1998 at \$100,000 per target, and
- (d) \$8.7 million SIBIA's share of the royalty payments from drugs that may eventually go to market.

¶35 Cadus asserted that the only basis the jury had for awarding \$18 million was the inclusion of \$8.7 million in royalty payments for future profits from marketable drugs, but that no marketable drugs had been found.⁷⁷ Cadus further argued that SIBIA's expert's use of the industry average hit rate in his estimation of Cadus' potential future profits was too speculative to form part of a reasonable damages award, because Cadus' infringing uses produced actual hit rates that were 20 – 100 times smaller.⁷⁸

¶36 SIBIA countered that the jury award was not necessarily based on their expert's opinion, but rather the jury may have based the award on its own reasoning as applied to the substantial evidence that SIBIA offered at trial.⁷⁹ SIBIA claimed to have presented evidence on several of the *Georgia-Pacific* factors by showing the inherent value of the claimed methods, the unique significance of those methods to Cadus, that the methods were core elements of Cadus' business, and that the methods were valuable to Cadus.⁸⁰ SIBIA argued that Cadus' use of the claimed methods generated financial benefits worth \$73 million to Cadus in the form of lucrative partnerships with major pharmaceutical companies.⁸¹ However Cadus replied that most of the \$73 million sum referred to by SIBIA was not, in fact, revenue derived from any infringing uses, and thus the jury's verdict should not have been based on evidence of that revenue.⁸²

¶37 SIBIA also argued that, even if the jury did base its award on their expert's opinion, the opinion was not unduly speculative.⁸³ His opinion was directed to the terms of a hypothetical pre-infringement license agreement that included front-end and back-end payments, including milestones, royalties, and equity. Estimation of these payments, SIBIA argued, required estimation of the probability that marketable drugs would result from the infringing use.⁸⁴

⁷⁵ Brief for Defendant-Appellant at 53-57, *SIBIA II* (Nos. 99-1381, 99-1391).

⁷⁶ Brief for Defendant-Appellant, *supra* note 75, at 55.

⁷⁷ Brief for Defendant-Appellant, *supra* note 75, at 55-56.

⁷⁸ Brief for Defendant-Appellant, *supra* note 75, at 58-60; Reply Brief for Defendant-Appellant at 25, *SIBIA II* (Nos. 99-1381, 99-1391).

⁷⁹ Brief for Plaintiff-Appellee at 42-43, *SIBIA II* (Nos. 99-1381, 99-1391).

⁸⁰ Brief for Plaintiff-Appellee, *supra* note 79, at 41-42.

⁸¹ See Brief for Plaintiff-Appellee, *supra* note 79, at 41-42.

⁸² Reply Brief for Defendant-Appellant, *supra* note 78, at 27-28.

⁸³ Brief for Plaintiff-Appellee, *supra* note 79, at 43.

⁸⁴ See Brief for Plaintiff-Appellee, *supra* note 79, at 44-45.

b. Analysis of the Damages Issues in SIBIA

¶38 The damages issues related to screening tools debated in *SIBIA* were (1) whether Cadus should pay royalties for infringing uses based on industry average hit rates or based on Cadus' actual hit rates, and (2) whether Cadus should pay royalties on projected profits from marketable drugs even though those profits had not yet been (and may never be) realized.⁸⁵ By using industry average primary hit rates rather than actual hit rates, SIBIA's expert may have overestimated the value of the invention to Cadus. Additionally, by projecting profits from potential drugs that might never reach market, he may have provided an overly speculative opinion on which the jury may have improperly based its award.

¶39 SIBIA's position was that the award was reasonable because it was what the parties would have agreed to in a hypothetical preinfringement license negotiation. Licenses under patents for screening tools in the pharmaceutical research industry often contain milestone royalty provisions for generation of primary hits as well as for any resulting marketable drugs found. Such milestone royalties were thus arguably reasonable in *SIBIA* because they were established provisions in licenses to comparable inventions. Cadus countered that the terms of the hypothetical license should have been commensurate with the extent of the infringement.⁸⁶ The hypothetical license agreement proposed by SIBIA projected profits based on primary hit rate estimates that dwarfed the actual primary hit rates, and based royalties on overly speculative guesses as to future profits from marketable drugs.

¶40 A reasonable royalty calculation that uses actual primary hit rates rather than industry average hit rates reflects the actual value of the invention to an infringer, and not just the average value for similar inventions.⁸⁷ Cadus argued that if actual primary hit rate data were available, then speculation should not have been allowed.⁸⁸ In support, Cadus cited *Oiness v. Walgreen Co.*⁸⁹ and *Brooktree Corp. v. Advanced Micro Devices, Inc.*,⁹⁰ two cases in which the Federal Circuit vacated damages awards that were based on overly speculative lost profits estimations.⁹¹ SIBIA distinguished those cases because they involved speculative estimates of *patent holders' lost profits*, whereas this case involved estimates of the *infringer's realized profits* in determining royalties for past infringement.⁹²

¶41 SIBIA's argument distinguishing those cases appears to create an unnecessary and artificial distinction between lost profits calculations and reasonable royalties calculations. The results of overly speculative profits projections are the same whether they are patentees' lost profits or infringers' profits. Speculative profits projections potentially overcompensate patentees by giving them damages that extend beyond their injuries. Furthermore, speculative profits projections potentially create additional and unnecessary hardships on infringers, and deter the use of research tools when potential researchers forego their use for fear of disproportionate liability or because of prohibitive transaction costs.

⁸⁵ See Brief for Defendant-Appellant, *supra* note 75.

⁸⁶ Brief for Defendant-Appellant, *supra* note 27, at 58.

⁸⁷ See *Unisplay, S.A. v. Am. Elec. Sign. Co., Inc.*, 69 F.3d 512, 518 n.9 (Fed. Cir. 1995) (upholding the trial court's jury instructions to "base its verdict on actual sales, not projected sales."). *But see* *Hanson v. Alpine Valley Ski Area, Inc.*, 718 F.2d 1075, 1080-81 (Fed. Cir. 1983) (holding that a reasonable royalty need not be based on the actual infringing use, but may be based on other factors that the parties would have considered in the context of a hypothetical negotiation at the time the infringement began).

⁸⁸ Brief for Defendant-Appellant, *supra* note 75, at 53-56.

⁸⁹ 88 F.3d 1025, 1029 (Fed. Cir. 1996).

⁹⁰ 977 F.2d 1555, 1581 (Fed. Cir. 1992).

⁹¹ Brief for Defendant-Appellant, *supra* note 75, at 54, 56.

⁹² Brief for Plaintiff-Appellee, *supra* note 79, at 46-47.

¶42 While the methodologies of lost profits and reasonable royalties calculations may differ, courts require both calculations to be grounded in *fact*, not speculation.⁹³ The Federal Circuit has encouraged trial courts to consider infringers' actual profits in reasonable royalty calculations, when there is sufficient evidence available.⁹⁴ But SIBIA's expert's opinion regarding industry averages was certainly relevant to determining what a reasonable royalty should have been.⁹⁵ The core of this damages issue was whether Cadus' evidence of its actual profits derived from its infringing activities was sufficiently more relevant to determining what a reasonable royalty should have been than SIBIA's evidence of the market rates for comparable inventions. As SIBIA pointed out in its brief, Cadus had a substantial burden to carry on appeal.⁹⁶ But *Oiness* and *Brooktree* show that the Federal Circuit is willing to reverse damages awards that are based on evidence that is too speculative.

C. The Consequences of Awarding Reach Through Royalties to Compensate for Infringement of Research Tool Patents

¶43 Reasonable royalty calculations are of necessity somewhat speculative and difficult. The reach through royalty awarded in SIBIA is a good example of the speculation and difficulties encountered when such calculations involve discoveries made by infringing uses of patented screening tools. The policy of compensating patent holders for infringement favors awarding them reach through rights if those rights could have been negotiated under a license agreement. But the policy against anticommons opposes reach through rights in this situation, even while favoring reach through awards for infringement of research tool patents claiming compounds. In the case of patented compounds, there are overlapping intellectual property rights between the areas of a newly discovered therapeutic use and the general use of the patented compound, an area that the patent holder owned exclusively to begin with. A policy against anticommons would thus allow compound patent holders to practice in areas that were formerly open to them before infringing uses resulted in patentable discoveries.

¶44 But patented screening tools are different. Acts of invention that infringe patents to screening tools generally result in the creation of new intellectual property that has no overlap with that covering the screening tools themselves. A policy against anticommons would oppose awarding reach through royalties in this case, because reach through royalties would create overlapping rights between those held by the screening tool patent holder and those held by the infringer in the area of the discovery.

¶45 Furthermore, if anticompetitive effects would result from a patentee's rigid policy of reach through licensing, then the screening tools patent might be rendered unenforceable under the doctrine of patent misuse. The first inquiry is whether the patent is licensed under terms that include royalties on subject matter that falls outside of the scope of the patent claims.⁹⁷ In the case of reach

⁹³ See *Bio-Rad Labs. v. Nicolet Instrument Corp.*, 739 F.2d 604, 616 (Fed. Cir. 1984) (stating that the "amount of lost profits awarded cannot be speculative . . ."), *rev'd on other grounds*, *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977 (Fed. Cir. 1995).

⁹⁴ *Fromson v. W. Litho Plate and Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988) (citing Supreme Court precedent for the rule that evidence of an infringer's actual profits from infringement, if it is available, is a "book of wisdom that courts may not neglect." (quoting *Sinclair Ref. Co. v. Jenkins Petroleum Co.*, 289 U.S. 689, 698-99 (1933)).

⁹⁵ See *Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970), *modified and aff'd*, 446 F.2d 295 (2d Cir. 1971) (reciting market rates for use of comparable inventions as factors to consider in determining reasonable royalty awards).

⁹⁶ Brief for Plaintiff-Appellee, *supra* note 79, at 40. SIBIA pointed out that Cadus had a substantial burden to carry in persuading the court to remand for a new trial on damages, that Cadus would have to show that the trial court had abused its discretion, but SIBIA only had to show that there was substantial evidence to support the jury's award. SIBIA further pointed out that damages need not be absolutely certain, and that any doubts regarding the amount of recovery are generally resolved against the infringer.

⁹⁷ See generally *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 708-09 (Fed. Cir. 1992) (explaining that, should license

through royalties for the use of screening tools, the subjects of the royalties are the discoveries made with the screening tools, and these discoveries do not generally fall within the scope of claims to the screening tools. Thus, the first inquiry should be answered affirmatively, leading to a second question: whether any anticompetitive effects that result from a reach through royalty would outweigh the benefits of exclusion.⁹⁸ If such a reach through royalty would be unreasonably anticompetitive in the context of patent misuse, then no reach through royalties should be awarded in the context of damages for infringing uses of screening tools.

1. *The Consequences of Excessive Damages Awards for Research Tool Patent Infringement*

¶46 The damages issues in *SIBLA* illustrate many of the issues that patent trial courts may have to decide in several other recently filed patent infringement cases involving related screening tool technologies.⁹⁹ Because trial courts have broad discretion in how damages awards are determined,¹⁰⁰ they should be aware of the consequences of awarding excessive damages for infringement of screening tool patents.¹⁰¹ Such awards, especially when they include royalties on discoveries that were never made, are likely to discourage some researchers from using any screening tools at all in order to avoid risking disproportionate liability in case the tools they use happen to be covered by claims in patents unknown to them. But even researchers who are not dissuaded from using screening tools are likely to disburse some financial resources for legal services such as infringement and validity opinions and licensing negotiations. Thus, such awards would tend to divert resources that might otherwise have been directed to research. These results conflict with the objective of the patent system to promote innovation by encouraging the use of screening tools. That objective would be better served by attenuating the legal barriers to research, thus encouraging researchers by removing the risk that even unprofitable uses of patented screening tools might result in substantial liability.

¶47 If trial courts were to only allow patentees to recover royalties on profits actually realized by infringers, then accountings of infringers' profits would almost always be required. Yet, one undisputed purpose of the 1946 amendment to the patent infringement compensation statute was to eliminate the requirement for accountings of infringers' profits in order to reduce the resulting difficulties and delays such accountings introduced in patent trials.¹⁰² *SIBLA* illustrates the reasoning behind this purpose. *SIBLA* accused Cadus of reporting incomplete and undercounted data regarding Cadus' infringing uses, and thus *SIBLA* argued that its evidence regarding industry average hit rates was a more relevant basis for the jury's damages assessment than Cadus' reported hit rate.¹⁰³

terms "be found to be reasonably within the patent grant, i.e., that . . . relate[] to subject matter within the scope of the patent claims, that ends the inquiry. However, should such inquiry lead to the conclusion that there are anticompetitive effects extending beyond the patentee's statutory right to exclude, these effects do not automatically impeach the restriction.").

⁹⁸ See *id.* at 708 (explaining that "[a]nticompetitive effects that are not per se violations of law are reviewed in accordance with the rule of reason.").

⁹⁹ See *Housey Pharms., Inc. v. Abbott Pharm. Corp.*, No. 01-401-SLR, 2001 U.S. Dist. LEXIS 5088 (D. Del. June 14, 2001); *Bayer AG v. Housey Pharms., Inc.*, 169 F. Supp. 2d 328 (D. Del. 2001); *ICT Pharms., Inc. v. Boehringer Ingelheim Pharms., Inc.*, 147 F. Supp. 2d 268 (D. Del. 2001).

¹⁰⁰ See, e.g., *TWM Mfg. Co., Inc. v. Dura Corp.*, 789 F.2d 895, 898 (Fed. Cir. 1986) (stating that the "methodology of assessing and computing damages under 35 U.S.C. § 284 is within the sound discretion of the district court.").

¹⁰¹ See Rebecca S. Eisenberg, *Technology Transfer and the Human Genome Project: Problems with Patenting Research Tools*, 5 RISK 163, 174 (1994) (noting that reach through royalties damages awards might deter innovation by suppressing the use of research tools).

¹⁰² Act of August 1, 1946, ch. 726, § 1, 60 Stat. 778 (codified at 35 U.S.C. 284 (2002)). See H.R. 1587, 79th Cong. (2d Sess. 1946) ("Frequently a suit for patent infringement involves the infringement of only an improvement in a complex machine, and it is impossible to apportion profits due to the improvement. In such circumstances, the proceedings before masters, which are conducted in accordance with highly technical rules and are always expensive, are often protracted for decades and in many cases result in complete failure of justice.").

¹⁰³ Brief for Plaintiff-Appellee, *supra* note 76 at 45-46.

But Cadus countered that the information it provided regarding its infringing uses was complete, that its reported hit rate was not undercounted, and that the industry average hit rates introduced by SIBIA were many times greater than the actual hit rates that Cadus found.¹⁰⁴

¶48 At trial, both parties presented the jury with a large quantity of evidence on damages, and the jury may simply have adopted the opinion of SIBIA's expert over that of Cadus' expert. Regardless of whether or not SIBIA's expert's opinion was too speculative, courts generally should ensure that jurors consider whether awards are commensurate with the true extent of infringement. Courts also should mitigate against the consequences of overly speculative profit projections. Jurors might be instructed, for example, that evidence of the actual benefits of infringement, when sufficiently proven, is more relevant to determining reasonable royalties than industry-wide average profits for the use of comparable inventions. Such instructions would increase the likelihood that jury awards would not exceed compensation, and therefore not discourage researchers from using screening tools.

2. *Lacking Foreseeability: Missing Pages from the Book of Wisdom*

¶49 Part III.B.1 above argued that reach through royalties should not be awarded for discoveries made with research tools having broad ranges of use, in part because no discovery made with broad-range research tools would have been anticipated by the parties during a hypothetical preinfringement negotiation. This argument might appear to conflict with the argument just made in the preceding sections that infringers' actual profits from infringement of intermediate range research tool patents should be considered more relevant to reasonable royalty determinations than industry averages. Just as the profits from an infringer's discovery made with a broad-range research tool would be unknown to the parties at the time of a hypothetical negotiation because the discovery itself would not have been anticipated, so too would the amount of an infringer's actual profits from discoveries made by infringement of intermediate range research tool patents be unknown. And no less an authority than the Supreme Court has characterized evidence of infringers' actual profits as a "book of wisdom that courts may not neglect."¹⁰⁵ The argument that royalties on actual profits from infringers' discoveries should be awarded for acts of infringement against narrower range research tool patents, but not for acts of infringement against broader range research tool patents, can be understood by considering the element of proximate cause.¹⁰⁶

¶50 Willing licensors and licensees of screening tool patents would contemplate some discoveries and the nature of those discoveries, but they would not know exactly how many or how profitable the discoveries would be. Here, the "book of wisdom"¹⁰⁷ of evidence of infringers' profits should prove helpful to the court in determining what royalty would be reasonable. However, willing licensors and licensees of broad range research tool patents would not contemplate any discoveries, or if they did, the nature of those discoveries would be unknown. A lack of foreseeability of future discoveries should decrease the relevance of evidence of infringers' profits from those discoveries, thus infringers' profits should be less relevant in cases involving patents for research tools with broad ranges of use.

¹⁰⁴ Brief for Defendant-Appellant, *supra* note 79 at 25.

¹⁰⁵ *Sinclair v. Jenkins*, 289 U.S. 689, 698-99 (1933) (cited in recent years by the Court of Appeals for the Federal Circuit in *Fromson v. Western Litho Plate and Supply Co.*, 853 F.2d 1568, 1575 (Fed. Cir. 1988)).

¹⁰⁶ See *Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1538, 1546 (Fed. Cir. 1995) (stating that "the reasonable limits of liability encompassed by general principles of law can best be viewed in terms of reasonable, objective foreseeability" and that recovery of damages that are foreseeable is "well within the traditional meaning of proximate cause").

¹⁰⁷ *Sinclair*, 289 U.S. at 698.

3. Patent Misuse as a Defense Against Infringement Actions Involving Research Tool Patents

¶51 *Bayer AG v. Housey Pharmaceuticals, Inc.*¹⁰⁸ is a declaratory judgment action involving two pharmaceutical companies. The plaintiff, Bayer, alleges *inter alia* that Housey misused its screening methods patents by requiring licenses with royalties on profits from sales of compounds found using the screening methods, even though the patents have no claims directed to those compounds *per se*.¹⁰⁹ Housey answered that Bayer failed to state a claim upon which relief could be granted, and moved to dismiss.¹¹⁰ But the Federal Circuit has held that proof of unreasonable anticompetitive effects of compulsory reach through licensing arrangements can render a patent unenforceable.¹¹¹ Therefore, the district court refused to dismiss Bayer's patent misuse claim, but it did dismiss Housey's counterclaim of infringement under 35 U.S.C. § 271(g).¹¹²

¶52 The district court held that § 271(g) only applies to processes for manufacturing products, and not to methods for identifying substances for further development.¹¹³ Even if Housey were able to prove that Bayer had used Housey's patented process to discover a drug outside of the United States, and also imported that drug for sale in the United States, Bayer would still not be liable under § 271(g) because Housey's patent claims simply do not cover the manufacturing process.

¶53 Whether reach through licensing of screening tool patents can give rise to patent misuse claims outside of the context of § 271(g) remains to be seen.¹¹⁴ But the district court's reasoning in *Bayer* regarding the patent misuse issue was not linked to its holding of non-infringement under § 271(g).¹¹⁵ Patent misuse defenses can be raised whenever patentees attempt to extend their patent rights to an unpatented product, giving rise to anticompetitive effects in the unpatented product's market.¹¹⁶ Therefore, one argument against awarding reach through royalties for infringement of screening tool patents would be that such arrangements tend to cause anticompetitive effects in the market for the unpatented product. However, screening tool patent holders might argue that they have efficiency justifications for reach through licensing agreements (e.g., reach through licensing agreements allow different licensees to pay for the use of patented screening tools in proportion to the value those tools ultimately give to the licensees).

4. CONCLUSION: COMPENSATION FOR INFRINGEMENT OF RESEARCH TOOL PATENTS AND ANTICOMMONS EFFECTS

¶54 The policy to encourage innovation is advanced by compensating aggrieved patent holders for any lost profits that were caused by infringing acts. Reasonable royalties should be awarded for acts of research tool patent infringement even when those acts cannot be proven to have caused lost profits. Reach through royalties may be appropriate to compensate for acts of infringement of

¹⁰⁸ 169 F. Supp. 2d. 328 (D. Del. 2001).

¹⁰⁹ Plaintiff's Complaint at 5-6, *Bayer* (No. 01-148).

¹¹⁰ Defendant's Answer at 2, *Bayer* (No. 01-148).

¹¹¹ See *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 708 (Fed. Cir. 1992) (explaining that patent misuse could exist where patentees demand royalties on unpatented products with anticompetitive effects).

¹¹² *Bayer*, 169 F. Supp. 2d. at 331. 35 U.S.C. § 271(g) provides in part that anyone who "sells or uses within the United States a product which is made by a process patented in the United States shall be liable as an infringer."

¹¹³ *Id.* at 330 (stating that "the Federal Circuit has not expanded the application of Section 271(g) beyond methods of manufacture.").

¹¹⁴ In *Bayer*, the district court ultimately granted Housey's motion for summary judgment, dismissing Bayer's claim for patent misuse because of its failure to provide evidence that Housey's licenses were conditioned on royalties on noninfringing activities. *Bayer AG v. Housey Pharmaceuticals, Inc.*, 228 F. Supp. 2d. 467, 470-74 (D. Del. 2002).

¹¹⁵ *Bayer*, 169 F. Supp. 2d. at 330-32 (dividing the opinion between a section dismissing the infringement claim and a section refusing to dismiss the patent misuse claim).

¹¹⁶ *Va. Panel Corp. v. MAC Panel Co.*, 133 F.3d 860, 869 (Fed. Cir. 1997) (stating that if "the practice has the effect of extending the patentee's statutory rights and does so with an anti-competitive effect . . . the finder of fact must decide whether the questioned practice imposes an unreasonable restraint on competition . . .").

narrower range research tools that result in profitable discoveries, but they should not be awarded on profits from discoveries made by infringing uses of broad range research tool patents because no hypothetical license agreement would contemplate such unpredictable discoveries.

¶55 In order to avoid the innovation-detering effects of anticommons, reasonable royalties calculations should be based on the actual profits an infringer realized if the parties would have anticipated that the licensed research tools would lead to profitable discoveries. A policy against anticommons would favor awarding reach through rights to a research tool patent holder for acts of infringement that result in discoveries that fall within areas already owned by the patent holders. However, such a policy would disfavor awarding reach through rights to research tool patent holders for acts of infringement resulting in discoveries that do not fall within areas owned by the patent holders because new ownership interests in previously undiscovered areas should belong to the discoverers.

¶56 Research tool patent infringement damages awards will not only influence the distribution of intellectual property rights at the conclusions of individual patent infringement cases, but they are also likely to significantly influence the terms that licensees would generally be willing to take under licenses because potential licensees would be unlikely to settle for license terms that were much less favorable to them than those that a court would impose. Patent trial courts should therefore advance the purpose of the patent laws by awarding damages that further the sometimes conflicting, yet sometimes complementary policy of compensating injured patent holders and opposing ownership of a single area of intellectual property by multiple parties.