

The Narrowed Experimental Use Exception to Patent Infringement and its Application to Patented Computer Software

by
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ABSTRACT

The common law experimental use exception has existed since the early 1800s as a defense to patent infringement where the use of the patented invention by the alleged infringer is for the mere purpose of intellectual curiosity, amusement or philosophical experimentation with no underlying business or commercial motive, or to confirm that an invention works the way it is disclosed in the patent specification. In the last six years, the U.S. Court of Appeals for the Federal Circuit has further defined and narrowed the scope of the exception by making not for profit institutions liable for patent infringement when using patented products for experimental purposes. Over the last thirty years there has also been a proliferation of computer software patents due to an expansion of what constitutes patentable subject matter. Due to the insufficiency of the disclosure requirements for certain computer software patents, there is a heavy reliance by software engineers to reverse engineer and design around patented computer programs. The narrowed experimental use exception results in an increased risk of patent infringement from reverse engineering and design around types of activities, which may ultimately threaten the pace of software development in the United States. The narrow exception may act as an incentive for the movement of computer software development to foreign countries with broader research exceptions than the U.S. and result in the loss of not only our leadership position, but also high skill technical jobs. The author sets forth three alternative types of legislative change to broaden the scope of the experimental use exception to help maintain technological progress and preserve our nation's leadership in computer software technology.

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INTRODUCTION

Dating as far back as 1813, courts have recognized an exception or defense to patent infringement for the non-consensual use of a patented invention.¹ This exception is known as the common law experimental use exception. It is a narrow defense to patent infringement that permits the use of a patented invention by someone other than the patent owner for intellectual curiosity without a commercial purpose.² In recent years, the United States Court of Appeals for the Federal Circuit (“CAFC”) has further defined the scope of the experimental use exception to patent infringement.³

Over the last thirty years, there has been a proliferation of patents related to computer software after the United States Supreme Court recognized

1. See *Whittemore v. Cutter*, 29 F. Cas. 1120 (C.C.D. Mass. 1813).
2. Jennifer A. Johnson, *The Experimental Use Exception In Japan: A Model For U.S. Patent Law?*, 12 PAC. RIM L. POL’Y 499, 502 (2003).
3. See, e.g., *Madey v. Duke University*, 307 F. 3d 1351 (Fed. Cir. 2002).

that computer software may constitute patentable subject matter.⁴ Software engineers have relied on the experimental use exception to reverse engineer and design around patented computer programs. A narrowed experimental use exception has potential ramifications in terms of both the patenting of computer software and also the enforcement of computer software patents. The purpose of this article is to explore the intersection between a narrowed experimental use exception and the development of patented computer software. More particularly, the article will address the impact of the narrowed experimental use exception on the reverse engineering of patented computer software and the development of new computer program technology within the United States and abroad.

This article proceeds in five parts. Part I discusses the history and early development of the experimental use exception. Part II reviews the policy reasons underlying the exception. Part III explores recent CAFC decisions addressing the exception. Part IV investigates the evolution of patented computer software and the impact of a narrowed experimental use exception. Finally, Part V explores options for broadening the scope of the exception.

I. EARLY HISTORY AND DEVELOPMENT OF THE EXCEPTION

In 1813, the common law experimental use exception was first put forth by Justice Joseph Story.⁵ In *Whittemore v. Cutter*, Justice Story made his famous statement “that it could never have been the intention of the legislature to punish a man, who constructed such a machine merely for philosophical experiments, or for the purpose of ascertaining the sufficiency of the machine to produce its described effects.”⁶

The exception subsequently was refined in *Sawin v. Guild*.⁷ Justice Story, in dictum, stated that it “must be the making with an intent to use for profit, and not for the mere purpose of philosophical experiment, or to ascertain the verity and exactness of the specification.”⁸ Justice Story further added, “the making must be with an intent to infringe the patent-right, and deprive the owner of the lawful rewards of his discovery.”⁹

In *Poppenhusen v. New York Gutta Percha Comb Co.*, the exception was further refined to exclude its use in business and commercial contexts.¹⁰ The Court held that where the making or using of a patented article is “done as a matter of business, where the product of that experiment has been

4. *See* *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972).

5. *Whittemore*, 29 F. Cas. at 1121.

6. *Id.*

7. *Sawin v. Guild*, 21 F. Cas. 554, 555 (C.C.D. Mass. 1813).

8. *Id.*

9. *Id.*

10. *Poppenhusen v. New York Gutta Percha Comb Co.*, 19 F. Cas. 1059, 1063 (C.C.S.D.N.Y. 1858).

thrown into the market to compete with the products of the plaintiff,” then the experimental use exception does not apply, and the party will be liable for patent infringement.¹¹ However, where it was merely an experimental use of the patented article and not with the intent to profit by it, the party will not be liable because the patent holder would not be injured by it.¹²

Three years later in *Poppenhusen v. Falke*, the same court reaffirmed the exception in stating that “an experiment with a patented article for the sole purpose of gratifying a philosophical taste, or curiosity, or for mere amusement, is not an infringement.”¹³ To clarify what constituted infringing experimental use, the court stated that experimentation with a patented invention for the purpose of adapting or perfecting the invention (i.e. designing around the patent) is patent infringement.¹⁴

In sum, courts in the 1800’s developed the experimental use exception to patent infringement to permit non-infringing uses of patented inventions under either of the following two circumstances:

- 1) For the mere purpose of intellectual curiosity, amusement or philosophical experimentation with no underlying business or commercial motive (philosophical experimentation prong), *or*
- 2) To confirm that an invention works the way it is disclosed in the patent specification (verification of the patent prong).¹⁵

II. POLICY REASONS UNDERLYING THE EXCEPTION

A. U.S. Constitution Article I, Section 8, Clause 8.

The Patent Clause of the Constitution states that Congress shall have the power “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.”¹⁶ The Patent Clause grants inventors exclusive rights to their inventions for a limited time in order to promote the progress of science. The Patent Clause reflects a balance between the need to encourage innovation by granting exclusive rights to inventors with the need to avoid monopolies which eliminate competition and discourage innovation by limiting the time of these exclusive rights. The experimental use exception to patent infringement sways this balance by providing less incentive for innovation, because the exclusive rights granted to inventors are not as strong if exceptions exist where a non-patent holder can use a patented

11. *Id.*

12. *Id.*

13. *Poppenhusen v. Falke*, 19 F. Cas. 1048, 1049 (C.C.S.D.N.Y. 1861).

14. *Id.*

15. Suzanne T. Michel, *The Experimental Use Exception To Infringement Applied To Federally Funded Inventions*, 7 HIGH TECH. L.J. 369, 372 (1992).

16. U.S. CONST. art. I, § 8, cl. 8.

invention without legal liability. This in turn further limits the patent monopoly. The scope of the experimental use exception is critical in maintaining the proper balance between encouraging innovation by inventors and also avoiding overly restrictive patent monopolies that eliminate competition.

B. 1952 Patent Act

In keeping with the Constitution's Patent Clause, the Patent Act, enacted by Congress in 1952, has as its underlying purpose the promotion of the progress of science. By granting the inventor the exclusive right to their invention for a limited time, the patent allows the inventor to exploit potential monopoly profits, thus encouraging invention and promoting the progress of science.¹⁷ Under the Act, the "exclusive right" to inventors is codified under 35 U.S.C. § 154(a)(1) as the patent holder's "right to exclude" all others from making, using, selling, offering to sell and importing the patented invention in the United States.¹⁸ The Patent Act upholds the patent holder's right to exclude for the patent term by codifying, under 35 U.S.C. § 271(a), that whoever, without authority of the patent holder, makes, uses, sells, offers to sell, or imports in the U.S. infringes the patent.¹⁹

A second important objective provided by the Patent Act and U.S. patent system is to encourage the development of an invention to the point of commercialization.²⁰ Typically, society will not reap the benefits of a patented invention unless it is developed and commercialized into a product. Developing a patented invention into a product that benefits society can be much more time consuming, costly and risky than the initial research investment that yielded the invention. The Patent Act provides an incentive for commercialization via the exclusive right to the invention for a period of twenty years.²¹ This incentive allows a company sufficient time to undertake an extensive product and commercial development effort and also to recoup the large research and development costs.²²

The Patent Act promotes a third important objective by providing an incentive for inventors to publicly disclose their invention.²³ In return for the exclusive right to exclude, the patent holder must disclose to the public how to make and use the invention.²⁴ Following the expiration of the patent term, the knowledge of the invention inures to the public who is free to practice

17. Michel, *supra* note 16, at 391.

18. 35 U.S.C. § 154(a)(1) (LexisNexis 2006).

19. 35 U.S.C. § 271(a) (West 2006).

20. Michel, *supra* note 16, at 392.

21. 35 U.S.C. at § 154(a)(2).

22. Michel, *supra* note 16, at 392.

23. *Id.* at 391.

24. 35 U.S.C. § 112 (West 2006).

and profit by the disclosed invention.²⁵ This in turn further promotes the ultimate goal of the U.S. patent system, which is “to bring new design and technologies into the public domain through disclosure.”²⁶ The experimental use exception to patent infringement and its scope must support these underlying objectives of the Patent Act in promoting invention, development, commercialization of new products, and public disclosure of the invention.

C. Legitimate Experimental Uses of Patented Inventions?

There are a number of experimental uses of patented inventions that are arguably legitimate from the perspective of not depriving the patent holder of the just rewards of his discovery while providing some other tangible benefit to society. One of these legitimate uses was set forth in *Sawin v. Guild* as permitting a patented invention to be reproduced to see if it functions as disclosed in the patent specification.²⁷ The benefit of this legitimate use is that it provides an incentive to inventors to insure data integrity of patent applications by allowing an independent means for others to verify the inventor’s findings and data pertaining to a patented invention.

A second legitimate use is to permit the patented invention to serve as a control for comparative testing. The potential benefit is that it allows a patent applicant to rebut a patent examiner’s prima facie case of obviousness by attempting to prove that a patent application possesses an unexpectedly superior property relative to the prior art control.²⁸ This use can also further promote the progress of science by allowing next generation improvements to be tested for efficacy relative to a recognized patented standard that may not be commercially available. The purchase of a patented invention carries with it an implied license to use it for any purpose without the risk of patent infringement.²⁹

A third legitimate use is to permit the patented invention to be used by others, enabling them to improve or design around the patented invention. This use potentially promotes the progress of science by encouraging rapid improvements of patented inventions, and methods of designing around patents. Also, many patented inventions will not be commercially available, and the patent holder may be unwilling to license the patent to someone who desires to use it for the purposes of improving upon it or designing around it.

The second and third uses are controversial because they are outside the scope of the experimental use exception and potentially deprive patent holders of a portion of the just rewards stemming from their exclusive rights. When evaluating any proposed change to the scope of the exception to fur-

25. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 151 (1989).

26. *Id.*

27. *Sawin*, 21 F. Cas. at 555.

28. *In re Mayne*, 104 F.3d. 1339, 1342 (Fed. Cir. 1997).

29. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 377 U.S. 476, 484 (1964).

ther encourage the second and third uses, one must consider the implications on the balance called for in the Patent Clause and the objectives and incentives provided for in the Patent Act.

D. Balancing Protection of Patent Rights with Incentives to Promote Scientific Progress

A broad scope for the experimental use exception will provide less protection for patent holders, and correspondingly will provide less incentive to researchers to invent and commercialize inventions, and disclose inventions to the public.³⁰ These potential outcomes are contrary to the objectives of the Constitution's Patent Clause and the 1952 Patent Act. A broader experimental use exception will provide more of an incentive for people to free ride on the work of patent holders by encouraging non-patent holders to design around and improve upon patented inventions.³¹ Free riding could lead to less basic research and development because inventors will not be afforded the same degree of patent protection of their exclusive rights.³² Inventors could also be more prone to maintain their inventions as trade secrets as opposed to disclosing their inventions to the public in the form of patents.³³ Licensing and cross-licensing agreements provide an alternative to free riding for companies that need to use a patented technology while still maintaining the objectives of the U.S. patent system.³⁴

Alternatively, patents that unduly restrict the tools and methods available to researchers limit scientific progress in certain fields, such as computer and software technology. An experimental use exception must maintain a proper balance by providing incentives for inventors to invent, develop, commercialize and disclose their inventions while not unduly restricting access by researchers to patented research tools and methods needed for further scientific progress in certain fields. The scope must be defined to provide an optimal balance between these competing objectives.

The purpose of the next section is to review recent CAFC decisions addressing the scope of the experimental use exception and the corresponding impact on the balance between the protections afforded patentees and the incentives to promote further research and development.

III. RECENT CAFC DECISIONS ADDRESSING THE EXCEPTION

A. *Embrex, Inc. v. Service Engineering Corporation*

In 2000, the CAFC in *Embrex, Inc. v. Service Engineering Corp.* ("SEC"), addressed the question of whether a competitor's use of a patented

30. Michel, *supra* note 13, at 394.

31. *Id.*

32. *Id.* at 394.

33. *Id.*

34. *See id.* at 395-96.

invention to test its efficacy while attempting to design around it falls under the common law experimental use exception.³⁵ Embrex was the exclusive licensee of a government patent under the Bayh-Dole Act for a method of inoculating birds against disease by injecting vaccines into a particular part of the egg prior to hatching.³⁶ Embrex designed an injection machine to carry out the method on large-scale chicken farms.³⁷ SEC was interested in building *in ovo* injection machines.³⁸ When Embrex refused to license the technology, SEC contacted two other companies to collaborate with to design around the patent.³⁹ Embrex sued SEC for patent infringement, which resulted in a settlement agreement between the parties and a dismissal of the suit.⁴⁰ SEC persisted, however, in trying to build *in ovo* injection machines by injecting the chicken embryo in a region not covered by the government patent.⁴¹ In assessing the effectiveness of the new injection position, SEC used the Embrex method for control testing purposes.⁴² Embrex again sued SEC, this time for willful infringement of the licensed patent.⁴³ SEC alleged that the tests on Embrex's patented method of inoculation did not infringe because they were scientific experiments with no resulting sales and were exempt from patent infringement liability under either the merely *de minimis* exception or under the experimental use exception.⁴⁴

The CAFC stated that it construes the experimental use defense narrowly.⁴⁵ The court also acknowledged that binding precedent recognizes the experimental use exception to infringement when experimentation is performed "for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry."⁴⁶ The CAFC concluded that SEC performed the experiments for commercial purposes, and the fact that the SEC tried to "cloak these tests in the guise of scientific inquiry, cannot immunize its acts."⁴⁷ The tests conducted by SEC on the patented method were not *de minimis* and did not fall

35. *Embrex, Inc. v. Service Engineering Corp.*, 216 F.3d 1343, 1346-49 (Fed. Cir. 2000).

36. *Id.* at 1346.

37. *Id.*

38. *Id.*

39. *Id.*

40. *Embrex*, 216 F.3d at 1346.

41. *Id.*

42. *See id.* at 1346-47.

43. *Id.* at 1347.

44. *Id.* at 1349.

45. *Embrex*, 216 F.3d at 1349.

46. *Id.* (citing *Roche Prods., Inc. v. Bolar Pharm. Co.*, 733 F.2d 858, 863 (Fed.Cir.1984)).

47. *Id.*

within the philosophical experimentation prong of the experimental use exception.⁴⁸ The CAFC affirmed the district court's denial of SEC's motion for judgment as a matter of law on the finding of infringement.⁴⁹ In *Embrex*, the CAFC held that the experimental use exception does not excuse the use of a competitive product in attempting to design around it or attempting to design an improvement of it.⁵⁰

Justice Radar agreed with the conclusions of the three-judge panel, but wrote a separate concurring opinion to address the experimental use defense.⁵¹ He emphasized that neither the 1952 Patent Act nor Supreme Court precedent justifies an excuse to infringement "because it was committed with a particular purpose or intent, such as scientific experimentation or idle curiosity."⁵² He cited the U.S. Supreme Court's decision in *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.* for the proposition that intent of the alleged infringer is irrelevant to a finding of patent infringement.⁵³ Justice Radar asserted that experimental use cannot exist even in its narrowest form as an excuse to patent infringement, and would eliminate the exception.⁵⁴

B. *Madey v. Duke University*

In 2002, the CAFC in the seminal case of *Madey v. Duke University* (hereinafter *Madey*) addressed the experimental use exception in the context of a university setting.⁵⁵ The plaintiff, Dr. John Madey, an acclaimed physicist in the field of electromagnetic radiation, was hired in 1988 by the defendant, Duke University.⁵⁶ Madey had previously worked for Stanford University, where he had secured two patents relating to laser technology.⁵⁷ Madey was the sole owner of U.S. Patent Number 4,641,103 ('103 patent) for a "Microwave Electron Gun", and U.S. Patent Number 5,130,994 ('994 patent) for "Free-Electron Laser Oscillator for Simultaneous Narrow Spectral Resolution and Fast Time Resolution Spectroscopy."⁵⁸ These two patents were embodied within three pieces of laboratory equipment. ⁵⁹ Various dis-

48. *Id.*

49. *Id.*

50. *See Embrex*, 216 F.3d at 1349.

51. *Id.* at 1352.

52. *Id.*

53. *Id.* at 1353 (citing *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 34 (1997)).

54. *Embrex*, 216 F. 3d at 1353.

55. *Madey v. Duke University*, 307 F. 3d 1351(Fed. Cir. 2002).

56. *Id.*

57. *Id.* at 1352-53.

58. *Id.* at 1353.

59. *Id.*

putes arose between Madey and Duke, which, in 1998, led to Madey's resignation from Duke.⁶⁰ After his departure from Duke, Madey alleged that Duke continued to use the lab equipment in the FEL lab embodying Madey's patented technology in violation of his two patents.⁶¹

Madey sued Duke University for patent infringement of the '103 and '994 patents. Duke defended by alleging that the University is exempted from patent infringement of the '103 and '994 patents under the experimental use exception because the alleged infringing activity relates to "non-commercial, academic research."⁶² The district court granted Duke's motion for summary judgment relative to the experimental use defense.⁶³ The district court recognized that the experimental use exception applies where the unauthorized patent use is "solely for research, academic, or experimental purposes" and held that it was still a viable defense to patent infringement for Duke because its use was "for experimental, non-profit purposes only."⁶⁴ Madey contended that Duke's research was "undertaken with commercial intent" because it receives government and private funding for its research, thus disqualifying the use of the exception.⁶⁵ Duke rebutted this contention by pointing out its policy on Inventions, Patents and Technology transfer that states in part that "[it] is dedicated to teaching, research, and expansion of knowledge."⁶⁶ "Although the University does not undertake research or developmental work principally for the purpose of developing patents and commercial applications, patentable inventions sometimes result from the research activities carried out wholly or in part with University funds and facilities."⁶⁷ The court concluded that Madey's allegations of commercial intent were insufficient to create a genuine issue of material fact to rebut Duke's experimental use defense to patent infringement.⁶⁸

Dr. Madey appealed the decision of non-infringement based upon the experimental use exception to the CAFC.⁶⁹ Madey claimed that the district court impermissibly shifted the burden of proof to rebut the experimental use exception defense to the plaintiff, and the district court impermissibly broad-

60. *Madey*, 307 F.3d at 1352-53.

61. *Id.* at 1352-53.

62. *Madey v. Duke University*, 266 F.Supp.2d 420, 424 (M.D.N.C. 2001), *aff'd in part, rev'd in part, and remanded*, 307 F.3d 1351 (Fed.Cir.2002), *cert. denied*, 539 U.S. 958, *subsequent appeal denied per curiam*, 78 Fed. Appx. 105 (Fed.Cir.2003).

63. *Id.* at 428.

64. *Id.* at 425.

65. *Id.* at 426.

66. *Id.*

67. *Madey*, 266 F.Supp.2d at 426.

68. *Id.* at 426-27.

69. *Madey*, 307 F. 3d 1351 at 1352.

ened the scope of the exception relative to precedent.⁷⁰ Finally, *Madey* argued that the evidence relied on by the district court was insufficient to support a finding of experimental use under the exception in regard to Duke's activities with the patented devices.⁷¹

The CAFC considered three questions on appeal. The first was whether the experimental use defense still exists.⁷² The *Madey* court held that the experimental use defense still exists in a narrow form and continued to recognize the exception as a defense to patent infringement.⁷³ The second question was which party has the burden of proof with regard to the exception.⁷⁴ The CAFC stated that the district court erred by requiring *Madey* to prove by a preponderance of the evidence that Duke's use was not experimental as part of his patent infringement claim.⁷⁵ The CAFC concluded that the burden rests on the alleged infringer to establish the basis for the experimental use exception defense.⁷⁶

The third and most controversial issue addressed by the *Madey* court involved defining the proper scope of the experimental use exception.⁷⁷ The district court stated that the exception applies "solely for research, academic, or experimental purposes," and its use must be "for experimental, non-profit purposes only."⁷⁸ The district court relied on *Ruth v. Stearns-Roger Mfg. Co.* to support its conclusion.⁷⁹ The *Madey* court concluded that *Ruth* was a break from precedent, which the CAFC had previously described as "narrow and strictly limited."⁸⁰ The *Madey* court also reaffirmed the scope of the exception as defined in *Embrex*.⁸¹ In particular, the philosophical experimentation prong of the exception permits unauthorized uses performed "for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry."⁸² Furthermore, an unauthorized use is disqualified from the exception if it has

70. *Id.* at 1360.

71. *Id.*

72. *Id.*

73. *Id.* at 1361.

74. *Madey*, 307 F.3d at 1361.

75. *Id.*

76. *Id.*

77. *Id.*

78. *Id.*

79. *Madey*, 266 F.Supp.2d 420 at 427 (referencing *Ruth v. Stearns-Rogers Mfg. Co.*, 13 F.Supp. 697, 713 (D. Colo. 1935), *rev'd on other grounds*, 87 F.2d 35 (10th Cir. 1936)).

80. *Madey*, 307 F.3d at 1362.

81. *Id.* at 1361

82. *Id.* at 1362.

the “slightest commercial implication” or is in keeping with the “legitimate business of the alleged infringer.”⁸³

The *Madey* court pointed out that although universities engaged in research projects may have no commercial applications, “these projects unmistakably further the institution’s legitimate business objectives, including educating and enlightening students and faculty participating in these projects.”⁸⁴ The CAFC also stated in dictum that “the profit or non-profit status of the unauthorized user is not determinative.”⁸⁵

The CAFC concluded that the district court erred in applying the experimental use exception, overturned the grant of summary judgment on the question of patent infringement, and remanded to the district court for further proceedings.⁸⁶ Duke University appealed the CAFC’s decision, however the U.S. Supreme Court denied the petition for a writ of certiorari.⁸⁷

In *Madey*, the CAFC narrowed the scope of the experimental use exception by not permitting it as a defense to patent infringement by a non-profit research institution. The *Madey* decision also clarifies that individuals and entities that use a patented invention without authorization may not be able to escape liability for infringement even if the use is merely for experimental purposes with no obvious, overriding and intended pecuniary results.

C. *Integra Lifesciences I, LTD v. Merck KGaA*

In 2003, the CAFC in *Integra Lifesciences I, LTD v. Merck KGaA* (“*Integra*”) also addressed the experimental use exception.⁸⁸ The plaintiff, Integra Lifesciences, sued Merck for infringement of four patents related to peptides for pharmacological applications.⁸⁹ Merck was unable to prove that its use of the patented peptides was “solely for uses reasonably related to the development and submission of information to the FDA” under 35 U.S.C. § 271(e)(1).⁹⁰ More particularly, Merck used Integra’s patented peptide technology to undertake research and development in the identification of new drugs.⁹¹ The district court held that 35 U.S.C. § 271(e)(1) did not immunize

83. *Id.*

84. *Id.*

85. *Madey*, 307 F.3d at 1362.

86. *Id.* at 1364.

87. *Duke University v. Madey*, 539 U.S. 958 (2003), *subsequent appeal denied per curiam*, 78 Fed. Appx. 105 (Fed.Cir.2003).

88. *Integra Lifesciences I, LTD. v. Merck KGaA*, 331 F.3d 860 (Fed. Cir. 2003) *vacated by* 125 S.Ct. 2372 (2005).

89. *Id.* at 862.

90. *Id.* at 867.

91. *Id.* at 863.

Merck against patent infringement.⁹² On appeal, the CAFC affirmed that the defendant's use of the patented peptide did not fall within the safe harbor provision of the Hatch-Waxman Act.⁹³

Though the CAFC's holdings in *Integra* were later overturned by the Supreme Court, Justice Newman's dissenting opinion in which she took the opportunity to express her dissatisfaction with the CAFC's holdings in not only *Integra*, but also *Madey*, provides a useful discussion regarding the scope of the experimental use exception⁹⁴ She questioned the extent to which someone needs a patent holder's permission to study what is already patented.⁹⁵ She stressed that the function of the patent system is not only to create incentives for innovation (via the exclusive rights granted the patent holder) but also to add to the body of published scientific information (via the written description, enablement, and best mode requirements for patentability).⁹⁶ Justice Newman advocated that either the common law experimental use exception or the statutory safe harbor provision under Hatch-Waxman should exempt users of patented inventions from infringement liability when conducting discovery-based research.⁹⁷

Justice Newman did not attempt to establish the boundaries of the experimental use exception beyond suggesting that it needs to be broader in certain areas, particularly for research and development purposes.⁹⁸ She would also allow the common law experimental use exception for research that has a commercial or business-related purpose where the research is conducted "to understand or improve upon or modify," a patented invention.⁹⁹ Newman proposes that the experimental use exception should be broadened to include activities related to designing around or improving upon a patented invention. The use of a patented invention as a control for testing or for reverse engineering purposes would be exempt from patent infringement liability under a broader Newman rule.

Justice Newman rebutted the panel majority's contention that a broadened experimental use exception would eliminate the patenting of research

92. *Id.*

93. *Integra Lifesciences I*, 331 F.3d.at 868.

94. *Id.* at 864.

95. *Id.* at 872-73.

96. *Id.* at 873.

97. *Id.* at 874.

98. *Integra Lifesciences I*. 331 F.3d at 876.

99. *Id.* See also Ronald D. Hantman, *Experimental Use as an Exception to Patent Infringement*, 67 J. Pat. Off. Soc'y 617, 639 (1985). Hantman also suggested more than 20 years ago that research on patented inventions for improvements and new uses in the technology ("designing around" activities) should not be considered infringement.

tools.¹⁰⁰ She distinguished “between research into the science and technology disclosed in patents, and the use in research of patented products or methods, the so-called research tools.”¹⁰¹ The broader-use exception would apply only to the former and not the latter category. In support of such a distinction, she went on to state that *Madey* was correctly decided on its facts because the patented laser devices used without authorization by Duke would fall into the class of research tools, and hence would not invoke the existing narrow common law exception.¹⁰² But Newman did object to the sweeping dictum in the *Madey* opinion and the failure of the court “to distinguish between investigation *into* patented things, and investigation *using* patented things.”¹⁰³ In *Madey*, Duke’s investigation would fall outside the scope of Newman’s broader experimental use exception because it used patented things. By contrast, Merck’s investigation at issue in *Integra* was one into patented things and would have been spared from liability under Newman’s broader experimental use exception.¹⁰⁴

Justice Newman’s dissenting opinion highlights the controversy surrounding the common law experimental use exception. Although the defense was not at issue in the case, Newman took the opportunity to argue for a broadened exemption to protect *Integra* from infringement liability when its use fell outside the bounds of the safe-harbor provision of Hatch-Waxman. She also believes that *Madey* would have the same outcome even if applying her broader experimental use exception, because Duke was conducting investigations *using* patented things. Newman’s broader experimental use exception would exempt from liability unauthorized uses of patented technology for designing around, improving upon, and using for test control purposes. The existing narrow experimental use exception would remain unchanged for all other uses, including using patented research tools in the course of research and development.

Newman also recognized that the experimental use exception needs to remain narrow to “preserve the patentee’s incentive to innovate,” namely through the right to exclude others from making, using, selling, and importing the patented article.¹⁰⁵ She commented that the rights of the inventor must be given primary consideration in light of any change to the existing patent law regarding the exception.¹⁰⁶ Despite this recognition of the importance of the inventor’s rights, she did not consider the impact of her broader experimental use exception for investigation into patented things on these

100. *Id.* at 877.

101. *Id.* at 878.

102. *Id.*

103. *Integra Lifesciences I*, 331 F.3d at 878. (emphasis added).

104. *Id.*

105. *Id.* at 876.

106. *Id.*

rights. In particular, the balance between the incentive to invent, the incentive to commercialize, and the incentive to disclose inventions must be considered in detail with Newman's broader experimental use exception.

D. *Soitec, S.A. et al. v. Silicon Genesis Corporation*

In 2003, the CAFC again addressed the experimental use exception in *Soitec, S.A. et al. v. Silicon Genesis Corporation*.¹⁰⁷ The plaintiff Soitec sued Silicon Genesis ("SiGen") for infringement of six claims of U.S. Patent No. 5,374,564 relating to a process for producing thin semiconductor material films.¹⁰⁸ The jury returned a verdict that claim 4 was infringed, but that claims 1-3, 5 and 9 were invalid for failing the enablement requirement of 35 U.S.C. § 112.¹⁰⁹ SiGen appealed, *inter alia*, the verdict of infringement of claim 4. One of SiGen's arguments on appeal was that a new trial should have been granted because of a faulty jury instruction.¹¹⁰ SiGen asserted that it had infringed only nominally in an attempt to "design around" the claims of the patent. SiGen had requested the district court to instruct the jury on whether three separate activities, research and development, Genesis Process, and NanoCleave, each constituted infringement, but the court refused to distinguish the infringement action.¹¹¹ SiGen argued that "the district court erred by failing to separate research and development from its commercial processes in the jury instruction."¹¹²

The CAFC reiterated that a fair use or research and development exception for infringement of normal commercial processes does not exist.¹¹³ The CAFC also found that the district court was correct to instruct the jury that the same infringement test applies "to any accused activity, regardless of whether it took place at the research and development stage or . . . at the manufacturing stage."¹¹⁴ In affirming the jury instruction of the district court, the CAFC explained that "[b]ecause infringement during the early stages of process development is nonetheless a violation of patent law, the district court was under no duty to distinguish research and development from later commercial processes."¹¹⁵

107. *Soitec, S.A. et al. v. Silicon Genesis Corp.*, 81 F.App'x 734 (Fed. Cir. 2003) (unpublished opinion).

108. *Id.* at 735.

109. *Id.*

110. *Id.* at 737.

111. *Id.*

112. *Soitec, S.A.*, 81 F.App'x at 737.

113. *Id.*

114. *Id.*

115. *Id.*

The CAFC's holding in *Soitec* is consistent with the narrowed experimental use exception of *Madey* under which a research purpose is irrelevant when determining whether a patent has been infringed.¹¹⁶ It is also consistent with Justice Radar's concurring opinion in *Embrex* that the intent of the alleged infringer is not a required element for finding patent infringement.¹¹⁷

E. Expected Rule of Law for Future Cases

Today, the common law experimental use exception is similar to case law established in the 1800s, which exempts liability for patent infringement under either the philosophical experimentation prong or the verification of the patent prong.¹¹⁸ The philosophical experimentation prong applies where the unauthorized use is solely for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry and not for commercial gain or in keeping with the legitimate business of the alleged infringer. The verification of a patent prong provides a defense to patent infringement where the unauthorized use is to confirm that an invention works the way it is disclosed in the patent specification.

The CAFC recently further narrowed the exception in comparison to the original scope established in the 1800s under the two-prong test. More particularly, the not-for-profit status of an infringing entity is irrelevant, and patents infringed for research purposes are not exempted under the exception. Using a patented product for reverse engineering, designing around, improving upon, or functioning as a control for testing purposes, are all uses which fall outside the scope of the experimental use exception to infringement. Because the exception is so narrow, it is rarely found as a winning defense to patent infringement.

The narrowed experimental use exception further sways the balance in favor of protection afforded patentees in comparison to incentives to promote further research and development. It has been suggested that the decreased incentives for the promotion of research and development may have a negative impact on scientific progress and long-term technological competitiveness of the United States.¹¹⁹ The purpose of next section is to explore the evolution of patented computer software and the potential ramifications of the narrowed experimental use exception to further technological progress in software development.

116. *Madey*, 307 F. 3d at 1362.

117. *Embrex*, 216 F.3d at 1352-53.

118. *See Whittemore*, at 1121; *Poppenhausen*, 19 Fed. Cas. at 1049.

119. Jennifer Miller, *Sealing The Coffin On the Experimental Use Exception*, 2003 Duke L. & Tech. Rev. 12, 4-5 (2003).

IV. APPLICATION TO PATENTED COMPUTER SOFTWARE

A. Evolution of Patented Computer Software

Over the past forty years there has been an expansion in the breadth of patentable subject matter because of pioneering breakthroughs in the fields of computers, biological sciences, and business methods. In 1972, the Supreme Court in *Gottschalk v. Benson* investigated the question of whether a method for converting binary-coded decimal numerals into pure binary numerals for use in general-purpose digital computers constituted patentable subject matter.¹²⁰ The Court held that the process claimed was “so abstract and sweeping as to cover both known and unknown uses of the binary coded decimal to pure binary conversion”¹²¹ and was therefore an attempt to patent an idea, not an actual process. The Court reasoned that if the formula was patented, the result would be a monopoly on a scientific truth; if it allowed a patent on the method, it would remove an algorithm from the public domain.¹²² The Court did point out that some computer programs were patentable subject matter.¹²³

Six years later, the Supreme Court in *Parker v. Flook* again investigated the question of whether a method for updating alarm limits in the catalytic conversion of hydrocarbons using a mathematical algorithm programmed into a digital computer constituted patentable subject matter.¹²⁴ The Court held that the claim was unpatentable because all it provides is a formula for updating an alarm limit which is simply a number, and if a patent was issued, it would be on a law of nature.¹²⁵ The Court reasoned that novelty independent of a law of nature must be demonstrated.¹²⁶ The Court went on to point out that a method utilizing a scientific principle is patentable if the process itself, and not merely the mathematical algorithm, is new and useful.¹²⁷

The trend of litigating computer program patent applications continued three years later when, in *Diamond v. Diehr*, the Supreme Court investigated whether a process for curing synthetic rubber, which utilized mathematical formula programmed into a digital computer as steps in the process, constituted patentable subject matter.¹²⁸ The Court reiterated that computer programs are unpatentable if they consist only of mathematical algorithms, however the mere presence of a computer program in an otherwise patentable

120. *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972).

121. *Id.* at 68.

122. *Id.* at 72.

123. *Id.* at 71.

124. *Parker v. Flook*, 437 U.S. 584, 585 (1978).

125. *Id.* at 594.

126. *Id.* at 591 (discussing *Mackay Radio & Tel. Co. v. Radio Corp. of Am.*, 306 U.S. 86, 94 (1939)).

127. *Id.* at 594.

128. *Diamond v. Diehr*, 450 U.S. 175, 177 (1981).

process does not render the overall invention unpatentable.¹²⁹ The Court upheld the patent claims for curing synthetic rubber as patentable subject matter because they constituted a specific application of a mathematical algorithm in a process, which when considered as a whole, is performing a process which the patent laws were designed to protect.¹³⁰ The requirements of 35 U.S.C. § 101 were met because the process was transforming an article into a different state by curing synthetic rubber.¹³¹ The Supreme Court in *Diehr* clarified that certain software-related inventions constitute patentable subject matter.¹³²

In re Alappat is a more recent en banc Federal Circuit decision involving the question of the patentability of computer-related claims for the use as a means for creating a smooth waveform display in a digital oscilloscope.¹³³ The court considered whether a rasterizer, which creates a smooth waveform by combining circuit elements to form a machine for converting discrete waveform data samples into pixel illumination intensity data for display, could be patented.¹³⁴ The court held that the rasterizer met all the requirements for patentable subject matter in that it is not a disembodied mathematical concept but is “rather a specific machine for producing a useful, concrete, and tangible result.”¹³⁵

Thus with these cases, the current law relating to the patentability of computer software programs is that a claim for a known general-purpose computer programmed with a new mathematical algorithm constitutes patentable subject matter. The rationale is that the new programming creates a new device because it transforms a general-purpose computer into a special-purpose computer once it is programmed to perform specific useful functions via the computer program.

B. How the Experimental-Use Exception Applies to Patented Computer Software

Patent law’s approach to the reverse engineering of software is similar to that of other types of inventions. The traditional perspective has been that companies may reverse engineer patented software without infringing patent rights as long as they do not make, use, or sell products embodying the pat-

129. *Id.* at 185.

130. *Id.* at 191- 193.

131. *Id.* at 184.

132. *Id.* at 185.

133. *In Re Alappat*, 33 F.3d 1526, 1537 (Fed.Cir. 1994).

134. *Id.* at 1537-38, 1540.

135. *Id.* at 1544.

ent.¹³⁶ In theory, reverse-engineering is unnecessary because the patent statute requires disclosure (written description, enablement, and best mode) in exchange for patent protection, such that any person skilled in the relevant art will be able to make and use the invention.¹³⁷ Unfortunately, in conformance with the first paragraph of 35 U.S.C. § 112, these patentability requirements do not necessarily mandate that a computer program listing be submitted as part of the patent application.¹³⁸ A computer program listing of 300 lines or less *may be* submitted with the patent application, and a program listing over 300 lines *must be* submitted as part of the patent application on a compact disc.¹³⁹ Even if a program listing is provided as part of the patent application, it may be in either object (machine) or source (machine-independent) code.¹⁴⁰ Flow charts or source code listings are not a requirement for adequately disclosing the functions of the software, but a patent applicant will often include a block diagram or flow chart within the patent application, which also satisfy the requirements of 35 U.S.C. § 112. This requires a significant amount of additional work to produce useful code that employs the patented invention.¹⁴¹ Therefore, in the result is a need to reverse engineer computer software as opposed to relying solely on the disclosure within a patent application.¹⁴²

Reverse engineering may be exceedingly complex to conduct on object code. For example, it is tedious to find the relevant portion of the code because many programs, particularly operating systems and complex application software, contain millions of lines of code.¹⁴³ Because of the aforementioned disclosure issues pertaining to computer software programs, reverse engineering for research and experimentation purposes has been traditionally permitted under the guise of the experimental use exception.¹⁴⁴

Generally there are three purposes for reverse engineering computer software. One purpose relates to research, more particularly to study the invention to discover its underlying ideas.¹⁴⁵ A second purpose for reverse engineering computer software is for competitive purposes without infring-

136. Lawrence D. Graham, *Economically Efficient Treatment Of Computer Software: Reverse Engineering, Protection, And Disclosure*, 22 RUTGERS COMPUTER & TECH. L.J. 61, 96 (1996).

137. *Id.*

138. *Id.*

139. Submission of Computer Program Listings, 37 C.F.R. § 1.96(b), (c) (2000).

140. *Id.* at § 1.96(a).

141. Graham, *supra* note 137, at 97.

142. Manual of Patenting Examining Procedure, Section 2106.01, 8th edition, 2001.

143. Graham, *supra* note 137, at 97.

144. *Id.* at 97.

145. *Id.* at 97-98.

ing the patentee's rights.¹⁴⁶ In this case, the company doing the reverse engineering must exercise care when applying the acquired knowledge, such that if the reverse engineer uses this newly-acquired knowledge in a manner that constitutes making, using, or selling the protected subject matter, the patent is infringed.¹⁴⁷ And finally, a third purpose of reverse engineering computer software is where the reverse engineer seeks to produce a product that is compatible with a product that is protected by a patent.¹⁴⁸ In this case, even where a software patent is fully enabling, it probably does not provide enough information required for compatibility, and therefore a computer programmer will still have to reverse engineer the software.¹⁴⁹ Because the patentee's software program embodying that invention is likely to be distributed only in object code, a competitor developing a compatible product will have to decompile the original program to obtain the requisite compatibility information, which has not traditionally been regarded as patent infringement.¹⁵⁰

Under all three computer software reverse-engineering purposes, the mere act of decompilation—going from source code to object code—has not been viewed as constituting patent infringement because of the experimental use exception.¹⁵¹ These traditional notions are now open to challenges based on the application of the two-prong test of the experimental use exception to the reverse engineering of the computer software, and the narrower experimental-use exception created by the *Madey* decision. In particular, computer software reverse engineering is probably rarely done for the mere purpose of intellectual curiosity, amusement, or philosophical experimentation with no underlying business or commercial motive. As discussed above, because of the inadequacies of the disclosure of computer software patents, reverse engineering is necessary and goes beyond confirming that the invention works the way it is disclosed in the patent specification. Therefore, neither the philosophical experimentation prong nor the verification of the patent prong of the experimental use exception is satisfied.

When an individual reverse engineers computer software, he or she engages in the act of reproduction which is technically a “making” of the patent invention for the purposes of the patent law and correspondingly an act of patent infringement.¹⁵² Even if the competitive software was purchased, the

146. *Id.* at 98.

147. *Id.*

148. Graham, *supra* note 137, at 98.

149. *Id.* at 98-99.

150. *Id.* at 99.

151. *Id.*

152. Brian Fitzgerald, Cristina Cifuentes, Anne Fitzgerald & Michael Lehmann, *Innovation, Software, and Reverse Engineering*, 18 SANTA CLARA COMPUTER & HIGH TECH. L.J. 121, 151 (2001).

reverse engineer would not be protected under an implied license accorded by the first sale doctrine. Moreover, the *Madey* decision resulted in a narrower experimental use exception because the traditional notion that the use of a patent invention for non-profit research purposes does not constitute patent infringement has been abolished. Similarly, the traditional notion that reverse engineering of patented computer software falls within the experimental use exception is open for attack because it squarely falls outside of the two prongs of the test for experimental use. The fact that the patent law disclosure requirements for computer software programs are currently inadequate is not sufficient to permit reverse engineering of the patented software under the experimental use exception.

Many patent law scholars, including Professor Chisum, have argued for a broader experimental use exception for computer software that would be more consistent with the patent laws in the rest of the world.¹⁵³ In particular, Professor Chisum stated that the temporary copying involved in an experimental use should be allowed, and to this extent the reverse engineering of software should not be an issue. Other patent law scholars argue for a limited right to reverse engineer patented software to permit the study of computer programs and the copying of the unprotected program elements. They assert that this would “preserve competition and compatibility between products, reinforce the enabling and disclosure function of the patent system, and set appropriate limits to the scope of the patent.”¹⁵⁴

C. Possible Loss of Software Development to Foreign Countries

Many countries codify in their patent laws an experimental use exception that is broader than the common law rule of law in the United States.¹⁵⁵ The United Kingdom, Belgium, France, Germany, Spain, Holland, and Japan have enacted research exemptions to patent infringement, permitting a patented invention to be used by someone other than the patentee to further its continued development.¹⁵⁶ For example, § 69(1) of the Japan Patent Law codifies the research exemption to patent infringement and states in part that “the effects of the patent right shall not extend to the working of the patent right for the purposes of experiment or research.”¹⁵⁷ The research exemptions in other nations further one of the fundamental underpinnings of a patent system: to promote continued development and technological progress when a patent application or patent enters the public domain. The narrow

153. *Id.*

154. *Id.*

155. Steven P. Caltrider & Paula Davis, *The Experimental Use Defense: Post-Madey v. Duke and Integra Lifesciences I LTD. v. Merk KGAA*, 86 J. PAT. & TRADEMARK OFF. SOC'Y 1011, 1032 (2004).

156. *Id.* at 1032 n.103.

157. Johnson, *supra* note 3 at 510 (quoting Tokkyoho, Law No. 121 of Apr. 13, 1959 (Japan)).

experimental use exception in the U.S. hinders this fundamental underpinning by imposing a risk of patent infringement on non-patentees who reproduce a patented invention with the intent to improve upon it.

The United States runs the risk of losing a portion of its innovative computer software industry to foreign markets if Congress does not institute some type of reform to the common law experimental use exception.¹⁵⁸ Not only are research and development costs lower in many foreign countries, but their patent laws are more conducive to the development of next-generation products and technology. In particular, research exemptions in foreign countries enable software development companies to reverse engineer patented computer software and develop next-generation products with a much reduced risk of patent infringement liability. This in turn provides a greater incentive for companies to outsource or relocate software development activities outside U.S. borders with a corresponding loss of high technology jobs.

The movement of computer software development abroad for research exemption purposes is also facilitated by a recent decision with regard to the scope of 35 U.S.C. § 271(g).¹⁵⁹ Under 35 U.S.C. § 271(g), anyone who imports into the United States products made by a process that is patented in the United States will be liable for patent infringement.¹⁶⁰ In *Bayer AG v. Housey Pharmaceuticals, Inc.*, the federal district court held that 35 U.S.C. § 271(g) “addresses only products derived from patented manufacturing processes, i.e., methods of actually making or creating a product as opposed to methods of gathering information about, or identifying, a substance worthy of further development.”¹⁶¹ On appeal, the CAFC affirmed the lower court decision that infringement under 35 U.S.C. § 271(g) is “limited to physical goods that were manufactured and does not include information generated by a patented process.”¹⁶² Thus, § 271(g) provides extraterritorial protection for manufactured products and creates a loophole for patents whose use outside the U.S. results only in information needed for the development of next-generation products.¹⁶³ Hence, the reverse engineering of patented computer software abroad would fall outside the protection of § 271(g) because it relates to information generated by a patented process as opposed to physical goods made abroad by a patented process and imported into the United States. As long as the next-generation computer software developed by reverse engineering patented software does not infringe the patent, the protections afforded by § 271(g) would not apply.

158. Alison Ladd, *Integra v. Merck: Effects on the Cost and Innovation of New Drug Products*, 13 J.L. & POL'Y 311, 353 (2005).

159. *Id.*

160. 35 U.S.C. § 271(g) (2003) (West 2006)

161. *Bayer AG v. Housey Pharm., Inc.*, 169 F. Supp.2d 328, 330 (D. Del. 2001).

162. *Bayer AG v. Housey Pharm., Inc.*, 340 F.3d 1367, 1368 (Fed. Cir. 2003).

163. Ladd, *supra* note 159 at 354.

The statutory research exemption available in many foreign countries in combination with the CAFC's interpretation of § 271(g) permits software companies to reverse engineer patented computer software abroad and reap the benefits of the foreign development efforts for next generation software in the United States with reduced risk of patent infringement. This in turn may encourage U.S. software companies to conduct software development activities abroad, which would slowly result in a flow of money, jobs, and new computer software technology outside of the United States.

The next section explores options for broadening the scope of the experimental use exception to further promote technological progress in the development of computer software.

V. OPTIONS FOR A BROADER EXCEPTION

A. Continued Judicial Development

A federal district court would not be able to broaden the scope of the exception because CAFC decisions serve as binding precedent. However, the CAFC could broaden the scope of the exception by deviating from its precedent. The rationale for the change would likely be challenged because the law is well settled. One option for change would be for the CAFC to take en banc an appeal implicating the experimental use exception. Because the CAFC had this option in both *Embrex* and *Madey*, it is unlikely that the CAFC will do so in a future case where the scope of the experimental use exception is at issue. For the Supreme Court to act, it would have to grant a petition for a writ of certiorari based upon a substantial change to the exception by the CAFC. It is unlikely that the judiciary will make a change to the current law, and the courts are not as well suited as Congress in balancing the competing concerns associated with such a change.

B. Legislate an Exception to Patent Infringement Liability - 35 USC § 271(e) Analogy

Legislative action is the preferred route for broadening the scope of the common law experimental use exception. One option is for Congress to amend the patent infringement statute (35 U.S.C. § 271) with a new subsection relating to experimental use of patents. Congress made such a change in 1984 by enacting the Hatch-Waxman Act, which added a narrow exception to the patent infringement statute (35 U.S.C. § 271(e)(1)) for the use of a patented drug solely for purposes reasonably related to the development and submission of information required for FDA application for generic versions of previously approved drugs.¹⁶⁴

In fact, Congress considered a bill entitled "The Patent Competitiveness and Technological Innovation Act of 1990" (H.R. 5598). Title IV under the Act entitled "The Research, Experimentation and Competitiveness Act of 1990" would have created a broader general exception for patent infringe-

164. 35 U.S.C. § 271(e)(1) (1988).

ment liability where the patented invention is used for research or experimentation purposes.¹⁶⁵ The proposed bill would have added 35 U.S.C. § 271(j) to the patent infringement statute, stating:

It shall not be an act of infringement to make or use a patented invention solely for research or experimentation purposes unless the patented invention has a primary purpose of research or experimentation. If the patented invention has a primary purpose of research or experimentation, it shall not be an act of infringement to manufacture or use such invention to study, evaluate or characterize such invention or to create a product outside the scope of the patented invention to which subsection (e)(1) applies.¹⁶⁶

The House Committee on the Judiciary report specified examples of unauthorized uses of a patented invention which would have been exempt from patent infringement liability under the proposed statute including:

1. Testing an invention to determine its sufficiency or to compare it to prior art;
2. Testing to determine how the patented invention works;
3. Experimenting on a patented invention for the purpose of improving on it or developing a further patentable invention;
4. Experimenting for the purpose of “designing around” a patented invention;
5. Testing to determine whether the invention meets the tester’s purposes in anticipation of requesting a license; and
6. Experimenting with the invention at the academic instructional level.¹⁶⁷

Examples 1, 2 and 5 would fall under the verification of the patent prong of the common law experimental use exception developed in the 1800s. Example 6 would fall under the philosophical experimentation prong of the of the common law experimental use exception. Examples 3 and 4 would broaden the scope of the exception because currently using a patented invention for designing around, improving upon, and using for test control purposes constitutes patent infringement.¹⁶⁸ In contrast, patented research tools, equipment, and supplies would fall outside the scope of the exemption from patent infringement liability.

H.R. 5598 was not enacted into law. Intellectual property and manufacturing associations opposed the bill because of concerns that a broader experimental use exception would decrease the incentives of the patent system and

165. The Patent Competitiveness and Technological Innovation Act of 1990, H.R. . 5598, 101st Cong. § 402 (1990).

166. *Id.*

167. *Id.*

168. *Roche Prod., Inc. v. Bolar Pharm. Co., Inc.*, 733 F.2d 858, 863 (Fed. Cir. 1984).

also provide unnecessary protection for universities.¹⁶⁹ Most university research would fall under examples 3 and 4, which would permit the use of patented inventions without paying licensing fees.¹⁷⁰ The proposed § 271(j) would have closely mirrored the broadened experimental use exception proposed by Justice Newman in her dissenting opinion in *Integra* by distinguishing between investigation into patented things (all 6 examples above), and investigation using patented things (research tools).

C. Legislate a Limitation on Remedies for Patent Infringement - 35 USC § 287(c) Analogy

Another option for broadening the scope of experimental uses of patented inventions is to limit infringement damages as opposed to creating an exception for infringement liability. The Legislature took this approach in regard to patented medical procedures that threatened public welfare by limiting access to, and increasing the price of, important medical methods. In 1996, Congress amended 35 U.S.C. § 287, the damages and remedies statute for patent infringement, to include a new subsection (c).¹⁷¹ 35 U.S.C. § 287(c) precludes the owner of a patent directed to a “medical procedure” from enjoining or obtaining damages from an infringer of that patent. But unlike scientific researchers, there was no indication that physicians, surgeons and other medical practitioners needed the incentives accompanying a patent to perfect their medical methods.¹⁷² The seminal case is *Morton v. New York Eye Infirmary*, which invalidated the patent on the use of ether for surgical anesthesia.¹⁷³ The patented invention was a medical breakthrough, and the suspected underlying reason why the court invalidated the patent was that life-saving medical procedures should not be privately owned but should be readily available to society.¹⁷⁴

By analogy to the physician immunity statute, the author proposes that the Legislature draft a bill that limits or even excludes remedies for certain types of experimental uses of patented inventions. If such a bill were passed, another sub-section would be added to 35 U.S.C. § 287, which would specify the limited remedies available in the case of patent infringement under 35 U.S.C. § 271(a) for unauthorized use of a patented invention. For example, one possible provision of a new subsection to 35 U.S.C. § 287 would state

169. Johnson, *supra* note 3, at 529.

170. Michel, *supra* note 16, at 390.

171. Janice Mueller, *No “Dilettante Affair”: Rethinking the Experimental Use Exception to Patent Infringement for Biomedical Research Tools*, 76 WASH. L. REV. 1, 52 (2001).

172. Eric Lee, 35 U.S.C. § 287(c)—*The Physician Immunity Statute*, 79 J. PAT. & TRADEMARK OFF. SOC’Y 701, 715 (1997).

173. *Morton v. New York Eye Infirmary*, 17 F. Cas. 879, 883 (C.C.S.D.N.Y.1862).

174. *Id.* at 883-84.

that a researcher's use of a patented invention for verification purposes would constitute infringement, but that instance of infringement cannot be the basis for monetary or injunctive relief against either the researcher or his entity. This alternative approach to limiting or excluding remedies for infringement maintains the strict meaning of 35 U.S.C. §271(a) in that anyone other than the patent owner who makes, uses, sells, or offers for sale a patented invention in the United States infringes the patent.

D. Legislate Compulsory Licensing of Patented Inventions

Another option for broadening the scope of the experimental use exception would be to pass a law that would make licensing of patented inventions compulsory in certain circumstances. Professor Rebecca Eisenberg suggests that a patent holder should not be able to enjoin an unauthorized user of a patented invention who engages in research for improving the patented technology or for designing around the patented technology.¹⁷⁵ Professor Eisenberg also suggests that the patent holder in certain instances be awarded a reasonable royalty rate via an after-the-fact compulsory license between the parties.¹⁷⁶ This would eliminate free riding on the part of the unauthorized user and also provide the patent holder some type of return for developing the patented technology. The compulsory after-the-fact royalty and exemption from patent infringement liability would be inapplicable for research uses of patented inventions where there is a primary market or significant market for such inventions because these patented inventions would be commercially available.

CONCLUSION

The CAFC's decision in *Madey v. Duke University* further narrowed the scope of the experimental use exception by making non-profit institutions liable for patent infringement when using patented products for experimental purposes. The potential ramifications of an even narrower experimental use exception are an increased threat of patent infringement litigation and less of a propensity for companies to use a patented product for reverse engineering and designing around. A narrowed experimental use exception is potentially problematic for computer software development because of the heavy reliance on reverse engineering patented computer programs, which may constitute patent infringement. This in turn may encourage software companies to move software development efforts outside the U.S. to a country with a broader research exemption. The importation into the U.S. of next generation computer software developed abroad would also likely fall outside the scope of 35 U.S.C. § 271 (g), which would further facilitate the movement abroad of computer software development. This may slowly suppress the

175. Rebecca Eisenberg, *Patents and the Progress of Science: Exclusive Rights and Experimental Use*, 56 U. CHI. L. REV. 1017, 1078 (1989).

176. *Id.*

amount of software research and development done in the U.S. and endanger the nation's future economic and competitive position in computer software technology.

The author believes that the time is right for a sweeping legislative change in the scope of the experimental use exception to continue the progress of scientific discovery and innovation of patented computer software. Congress had the opportunity to propose such legislation as part of the Patent Reform Act of 2005,¹⁷⁷ but it neglected to include a section in the bill pertaining to experimental use due to other priorities. Of the four options set forth in this article for broadening the scope of the experimental use exception, the author recommends the option for statutorily limiting or even excluding remedies for certain types of experimental uses of patented inventions such as to maintain the strict meaning of patent infringement under the Patent Act. Most importantly, this option will also not unduly shift the balance from protections afforded patentees to incentives to promote scientific progress under the U.S. patent system.

The author hopes that the ideas presented in this article will serve as a useful starting point for Congress to once again consider proposing a bill for a broadened experimental use exception to patent infringement to help preserve the long term technological competitiveness of the United States.

177. Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005).

