Engineering Competitive Policy and Copyright Misuse

Marshall A. Leaffer
Indiana University Maurer School of Law, mleaffer@indiana.edu

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Does the copyright misuse doctrine prohibit attempts by software owners to impede others from reverse engineering software to develop non-infringing competing or compatible software? This issue is particularly important after *Sega Enterprises, Ltd. v. Accolade, Inc.*,¹ which held that reverse engineering for purposes of developing non-infringing competing or compatible software is a fair use of copyrighted software. In a comprehensive and well-articulated opinion, the Ninth Circuit recognized the fundamental importance of reverse engineering through disassembly and decompilation to develop non-infringing and compatible programs.²

Although reverse engineering is permissible in other areas of intellectual property law,³ when a software program is reverse engineered, copyright infringement may occur at several stages of the process. For example, to enhance his ability to analyze the program's ideas and structure, a programmer may wish to translate object code⁴ into source code,⁵ thus facilitating analysis. This process requires the making of several copies of the program and implicates the issue of copyright in-
fringement. Despite the obvious infringement of the copyright owner's reproduction right, the court in *Sega* found reverse engineering a fair use of the targeted software; this use fundamentally supports the progress of science and the useful arts.

The tension between software owners and those wishing to unlock a program's secrets through reverse engineering is not new. Even before *Sega*, software owners had used both legal and technological means to discourage reverse engineering. These have run the gamut from license agreements prohibiting reverse engineering to technological impediments inserted into software and designed to render the reverse engineer's task more difficult. This perennial battle between owners and those wishing access will increase in intensity. In this Article, I predict that software owners will show a renewed interest in deterring reverse engineering after *Sega*. The question presented is whether such attempts to impede reverse engineering constitute copyright misuse and a defense to an action for copyright infringement, now that intermediate copying for reverse engineering purposes to produce a compatible or non-infringing program is a fair use. Although the same conduct may raise antitrust issues, this Article will focus its discussion on the defense of copyright misuse. If the misuse defense is a viable defense, and this is by no means certain, it will enjoy more universal applicability than an antitrust counterclaim. Why would the copyright misuse defense be more attractive to litigants if the same commercial conduct may raise both antitrust and misuse issues? The reason lies in major differences in their scope and application. Unlike an antitrust counter-

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7. Unlike the Semiconductor Chip Protection Act (SCPA), which specifically recognizes an affirmative defense of reverse engineering, the Copyright Act does not explicitly incorporate a reverse engineering privilege. Under § 906(a)(1) and (2) of the SCPA, developers can "reproduce the mask work solely for the purpose of teaching, analyzing, or evaluating the concepts or techniques embodied in the mask work" and "incorporate the results of such conduct in an original mask work which is made to be distributed." 17 U.S.C. § 906(a)(1)-(2) (1988); see also Leo J. Raskind, *Reverse Engineering, Unfair Competition, and Fair Use*, 70 MINN. L. REV. 385 (1985).

8. This is true, at least in the short run. In this constantly changing industry, the same companies that may wish to impede access may want to gain access to others' programs. Thus, the Segas of the world may trade places with the Accolades in seeking reverse engineering for purposes of compatibility. If that occurs, reverse engineering will become an industry norm to an even greater extent than it is today, and the incentive to sue for such activities will diminish.

9. Of course, antitrust has an important role to play in establishing the competitive relationships in any industry, particularly in an industry like that of video game platforms in which the market is dominated by two participants. If the relevant market were to be defined in such a manner, exclusionary conduct on the part of a company like Sega would raise issues of monopolization and attempted monopolization. See generally, 3 Areeda & Turner, *Antitrust Law* §§ 814-15 (1978).
claim, the copyright misuse defense is a per se violation, since it avoids the uncertainties and difficulties involved in proving that a restraint is unreasonable under the antitrust laws. Until the 1990 Fourth Circuit opinion in Lasercomb America, Inc. v. Reynolds, the misuse defense had received almost no recognition in copyright law, in contrast to its long and tortured history in patent litigation. This relatively obscure doctrine, based on quasi-antitrust and unclean hands principles, may attract new interest as owners of software copyrights try to erect contractual and technological barriers to reverse engineering.

Before discussing copyright misuse, I will present a brief overview of reverse engineering’s important role in software development and its place in other branches of intellectual property law. Whether the misuse defense is applicable against these attempts by software owners will depend on whether reverse engineering, particularly through decompilation and disassembly, is the only feasible way in which a software developer may have access to the fundamental ideas, structures, and processes embodied in many software programs. In short, whether copyright misuse applies to anti-reverse engineering measures will depend on the solidity of Sega’s fair use justification of reverse engineering allowing certain forms of copying despite the appearance of copyright infringement.

II. REVERSE ENGINEERING IN COMPUTER SOFTWARE: COMPETITIVE CONCERNS

A. Reverse Engineering in General

Described as software archaeology, reverse engineering is the process of taking a finished product and working backwards to discover how it works. Reverse engineers must extract the software’s functionality (what it does) from its design (how it does it). They accomplish this task by analyzing the software’s programming code, data structures, files, and databases. Reverse engineering is performed by translating the unreadable object code of a program into more accessible source code. This decompilation or disassembly process is often accomplished automatically by special translation programs. Although there are other less controversial methods of reverse engineering that do not require one to copy aspects of the underlying program, the translation processes of decompilation and disassembly, by definition, necessitate varying degrees of interim copying. Pervasively used in the computer industry, these processes have become an industry norm.

10. Id.
11. 911 F.2d 970, 976 (4th Cir. 1990).
The issue of reverse engineering is of particular importance for computer software because of its uniqueness when compared with older forms of copyrightable subject matter. Despite being categorized under the Copyright Act as literary works, computer software differs significantly from other copyrighted works enumerated in section 102 of the statute. Unlike other copyrighted works, computer programs are not immediately intelligible to the reader, viewer, or listener. To develop either competitive or compatible products, interim copying into an intelligible medium may therefore be necessary to study a program's sequence and logic.

In this savagely competitive and rapidly developing industry, the practice of making interim copies through decompilation and disassembly techniques has become an industry standard. The reason for the widespread adoption of reverse engineering techniques relates to the way in which software is developed and its accessibility to human comprehension as it progresses from source code to machine-readable language. Most computer programs are written first in "source code," a natural language understandable to programmers that uses a combination of words and arithmetic expressions. Once the program has been written in source code, it is translated into machine-readable code. This step is known as "compilation," and the resulting "object code" is largely unintelligible even to the skilled programmer. Many software owners distribute their software only as object code. One who wants to study the ideas embodied in the program cannot do so directly from the object code. To perceive these ideas, one must first reverse engineer the object code into source code. Here, the object code must be "decompiled" to produce source code. The decompilation process generally requires making copies of the original copy. Once the object code is decompiled into source code, a skilled programmer can easily analyze the code, the objective of which is to develop compatible or competing software.

Prohibition of reverse engineering through decompilation would erect a serious obstacle to developers who legitimately desire to create compatible software, which many would argue is essential to innovation.
in the computer industry.\textsuperscript{15} It is possible for a programmer to engage in reverse engineering without making an interim copy of the target program. This may be accomplished by executing the program and examining its external attributes, or even by obtaining information about the program from published specifications, manuals, and standards documents.\textsuperscript{16} In practice, however, copies are made at several stages of the process because the alternative method of examining code on a computer screen is not feasible. Prohibiting a programmer from analyzing hundreds of pages of code in paper form would be the death knell of effective reverse engineering in many circumstances, increasing its cost to the point of unfeasibility. Sega engrafted these assumptions about the necessity of reverse engineering into copyright law through the doctrine of fair use.

B. Sega, Fair Use, and the Underlying Policies of Copyright Law

The Sega case places itself squarely in a long line of copyright cases that attempt to adapt copyright to the challenge of the new technologies by applying the infinitely malleable defense of fair use.\textsuperscript{17} Fair use has been used by the courts as a means to fashion competitive policy in certain copyright industries. Unfortunately, the "fair use" defense can be an unsatisfactory tool when improperly applied. One thing is certain, however: A finding of fair use or lack thereof in a critical case may define the competitive relationships for an entire industry. As a result, most courts applying the doctrine have ultimately found fair use, opting for dissemination of the copyrighted material. Courts tend to avoid a contrary finding (lack of fair use and infringement) that would risk suppressing a new, developing technology. This hands off

\textsuperscript{15} See supra notes 12-14 and accompanying text for a discussion of the nature of innovation in computer technology.


\textsuperscript{17} 17 U.S.C. § 107 (1988 & Supp. 1992). Section 107 provides:

Notwithstanding the provisions of sections 106 and 106(A), the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include—

(1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;

(2) the nature of the copyrighted work;

(3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and

(4) the effect of the use upon the potential market for or value of the copyrighted work.

\textit{Id.} The fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors.
attitude is consistent with the traditional role of the judiciary. This role is simply to decide disputes between two parties. By comparison, the courts have had a long-standing reluctance to involve themselves in regulatory decrees that entail setting up institutional mechanisms to enforce a given remedy. The Sony Corp. of America v. Universal City Studios, Inc.\textsuperscript{18} and Williams and Wilkins Co. v. United States\textsuperscript{19} cases provide good examples of this judicial reluctance. In both cases, the courts found that the defendant engaged in fair use, thereby allowing customary practices in the video recording and photocopying industries. By finding fair use, these courts avoided intrusive piecemeal judicial regulation of a new technology. In similar fashion, the Sega court took a constrained approach, finding fair use where the contrary would override entrenched industry practices.

Copyright may be defined as a system of intangible property rights that balances the interests of authors to control and exploit their writings with society's competing interests in the free flow of ideas and information.\textsuperscript{20} In its most general dimension, a properly working copyright law would optimize the production and dissemination of works of authorship. The Copyright Act encourages production of works of authorship by rewarding authors with exclusive rights to control access to their work.\textsuperscript{21} At the same time, the Act allows access (or one might say encourages dissemination) to the work by subjecting these rights to certain limitations.\textsuperscript{22}

The most global limitation on copyright protection resides in the idea expression principle. Succinctly stated, copyright does not protect ideas per se, but the way in which those ideas are expressed. This fundamental principle is embodied in section 102(b) of the Act, precluding protection for idea, procedure, process, system, method of operation, concept, principle, or discovery.\textsuperscript{23} The public is free to use these fundamental building blocks necessary to produce other works in both the artistic and scientific realms.

The other major limitation to copyright protection is found in the privilege of fair use. Prudently applied, fair use fine tunes the optimization of creation and dissemination of information. In so doing, it harmonizes the underlying goals of copyright. Similarly, the doctrine of fair use as codified in section 107 allows access for certain limited purposes that would support the progress of science and the useful arts.

\textsuperscript{19} 187 F.2d 1345 (Ct. Cl. 1973), aff'd, 420 U.S. 376 (1975).
\textsuperscript{20} Sony Corp., 464 U.S. at 429-30.
\textsuperscript{22} See 17 U.S.C. §§ 107-120.
The subject matter limitation of section 102(b) and the fair use privilege of section 107 were the bases for the *Sega* court's finding that Accolade's reverse engineering of Sega's software did not constitute an infringement of copyright. In *Sega*, Accolade decompiled Sega's video game programs to develop game cartridges compatible with Sega's "Genesis" video entertainment system.\(^{24}\) In rejecting Sega's action for infringement, the Ninth Circuit affirmed that the Copyright Act permits an individual in rightful possession of a copy of a work to understand the work's ideas, processes, and methods of operation.\(^{25}\) The court found this permission to reside in the defense of fair use.\(^{26}\)

The defendant, Accolade, an independent developer of video game cartridges, purchased Sega game cartridges and generated printouts of the Sega source code by running the Sega object code through a "decompiler."\(^{27}\) Its reverse engineering efforts eventually enabled Accolade to produce a compatible cartridge.\(^{28}\) The Ninth Circuit held that although this kind of interim copying constituted copyright infringement, the copying was privileged as a fair use.\(^{29}\) In reviewing the enumerated factors,\(^{30}\) the court focused on the nature of the copyrighted work.\(^{31}\) The court referred to the hybrid nature of computer programs, where there is no settled standard for distinguishing protected expression from unprotected idea. If disassembly were an unfair use per se, the copyright owner would have a de facto monopoly over the functional aspects of the work. Such a monopoly would face the more stringent standards of patent law. Because Sega's video games contained unprotected aspects that could not be examined without copying, the court determined that the games must be afforded a lower degree of protection than more traditional literary works.

After *Sega*, intermediate copying is a fair use if it is necessary to understand the ideas and processes embodied in the work. When this issue arises, section 107 of the Copyright Act requires the court to scrutinize the nature of the work to determine if reproduction is a fair

\(^{24}\) 977 F.2d 1510, 1515 (9th Cir. 1993).
\(^{25}\) Id. at 1520.
\(^{26}\) Id. at 1521.
\(^{27}\) Id. at 1516.
\(^{28}\) Id. at 1523.
\(^{29}\) See *supra* note 17.
\(^{30}\) *Sega*, 977 F.2d at 1523. The court also found that the first factor, the purpose and character of the use, was in Accolade's favor because any commercial exploitation was indirect and derivative. Id. at 1522. The fourth factor, effect of the copying on the potential market, favored Accolade as well because it was a use that merely enabled the copier to enter the market for works of the same type as the copied work. The factor in Sega's favor was the amount and substantiality of the copying which included wholesale copying, but this was given little weight since the ultimate use was limited. Id.
use. Disassembly of object code to discern the unprotected ideas in a computer program is a fair use promoting science and the useful arts when done to create other non-infringing or compatible works.\textsuperscript{32} The fair use privilege applied in this way recognizes the unique attributes of computer software. It keeps an author from acquiring patent-like protection by putting an idea, process, or method of operation in an unintelligible format and asserting copyright infringement against those who try to understand that idea. One might interpret Sega as preventing the software owner from extending his property right beyond the terms of the boundaries provided by copyright law.\textsuperscript{33} The Sega court suggested a similar idea stating, "[Sega's] attempt to monopolize the market by making it impossible for others to compete runs counter to the statutory purpose of promoting creative expression and cannot constitute a strong equitable basis for resisting the invocation of the fair use doctrine."\textsuperscript{34} Thus, Sega is permeated with anti-monopoly rhetoric.\textsuperscript{35} Although the court did not expressly raise the issue of copyright misuse, it was clearly troubled by Sega's attempt to control access to the work and thereby defeat the purposes of copyright.

When Sega is read in this manner, the following question may be posed: Do software owners overstep the boundaries of the copyright grant when they prevent or inordinately raise the costs of reverse engineering and intermediate copying through contractual or technological impediments? Stated this way, the issue of copyright misuse is raised. The elusive doctrine of copyright misuse, since the 1990 Lasercomb America, Inc. v. Reynolds\textsuperscript{36} case, has enjoyed a modest revival. But to determine whether copyright misuse has a renewed role to play, the doctrine must be reexamined in its better known application as a defense to an action for patent infringement.

C. Computer Software: A Cumulative Technology

By giving a green light to the most effective kind of reverse engineering, one that involves interim copying, the author believes that

\textsuperscript{32} Arthur Miller has argued that allowing decompilation places an enormous burden on the program copyright owner to discover and prove infringement, particularly under the Altai approach of proving substantial similarity. See Arthur Miller, Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?, 106 Harv. L. Rev. 977, 1027 (1992).


\textsuperscript{34} Sega, 977 F.2d at 1523-24.

\textsuperscript{35} Id.

\textsuperscript{36} 911 F.2d 970 (4th Cir. 1990).
Sega at least implicitly stands for certain assumptions about rapidly changing, technologically driven industries such as the computer software industry. The Ninth Circuit Court of Appeals opinion provides a dramatic attempt by a court, using copyright law, to pattern the competitive relationships in the computer software field. The Sega court was reluctant to hinder industry practices that built on the accumulated knowledge of prior software developers to facilitate production of non-infringing programs. The court's attitude about the computer software industry is consistent with current notions about the way progress occurs in rapidly developing technologies.

Computer software may be characterized as a “cumulative technology,” an attribute it shares with other rapidly developing areas of technology. In “cumulative technology” industries, future advances build incrementally on previous recent developments. In areas of rapidly moving cumulative technologies, a copyright court is faced with a dilemma: If protection is given too broad a scope, it may retard the advancement of innovation in an industry (like the software industry) in which innovation proceeds through sequential development. Many economists would agree that getting technology to the market sooner will raise consumer welfare and encourage further development of new generations of products, particularly in industries with cumulative technological characteristics. The ability to readily engage in reverse engineering promotes cumulative innovation by adding incremental value to the succeeding product, reducing development costs, and accelerating further innovation. By allowing reverse engineers to build on previous developments, the Sega court implicitly adopted this vision of technological progress.


39. Suzanne Schotmer, Standing on the Shoulders of Giants: Cumulative Research and the Patent Law, 5 J. ECON. PERSP. 29, 31 (1991). The Sega court came close to recognizing the cumulative innovation principles finding that an “increase in the number of independently designed video game programs” was a “growth in creative expression,” precisely the objective of the Copyright Act. Sega, 977 F.2d at 1523.

40. As such, Sega does not reflect a technophobic tendency among the judiciary as Anthony Clapes has argued. See Anthony L. Clapes, Confessions of an Amicus Curiae: Technophobia, Law and Creativity in the Digital Arts, 19 U. DAYTON L. REV. 903 (1994). Rather, its approach favors dissemination of technology in an industry that thrives on the latest incremental developments.
D. Erecting Barriers to Reverse Engineering

Assuming the legal principles set forth in Sega are firmly grounded and will be adopted by circuits other than the Ninth Circuit, reverse engineers will hardly have a free ride. Nor will the decision facilitate massive infringement resulting from the labors of reverse engineers who will cleverly mask their copying by rearranging the code. First, decompilation for many programs is technically difficult and costly. Reverse engineering cannot be used by just any aspiring pirate. Second, the decompilation task may become even more costly as software owners employ self help (lock out) techniques to render ideas and trade secrets embodied in their programs more secure. In response to a threat of reverse engineering, software owners may increase their efforts by placing both legal and technological hurdles in the path of those trying to understand the function of their program. Companies will engage in technological strategies to render the task of reverse engineering more costly. One might view these technological hurdles as merely another device used by businesses to protect their proprietary information. Accordingly, software developers will erect barriers to protect both the ideas embodied in the program and the accompanying proprietary information concerning valuable trade secrets embedded in the code.

If Sega results in attempts by manufacturers to hinder reverse engineering, then consumer welfare will suffer. Security comes at a

41. The procedural context of the case renders the decision somewhat more narrow than it is at first blush. The Sega court vacated a preliminary injunction, holding that the district court, as a matter of law, had misapplied the four factor fair use test. Sega, 977 F.2d at 1521-28. The court rejected a blanket rule permitting copying. After all, fair use must be decided on a case-by-case basis, leaving future litigants to distinguish their cases by more clearly establishing hardships pointing in their favor. Moreover, Sega is the rule in the Ninth Circuit only, and even the Nintendo case decided by the Federal Circuit based its decision on Ninth Circuit law. Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832 (Fed. Cir. 1992). Both Atari and Sega analyzed fair use solely in the context of the four factors recited in § 107. But as the statute itself states, and as Sega recognized, these statutory factors are not exclusive because fair use is an equitable rule of reason. Although both courts held there was fair use, the tortuous manner in which each court analyzed the four factors (and only those factors), coupled with the relatively narrow holdings, raises the question whether a future court, presented with facts differing only slightly from those in Atari and Sega, will recognize a fair use defense. Both courts identified the problem inherent in the argument that copyright includes a right to preclude decompilation.

42. See generally Johnson-Laird, supra note 14.

43. As David Friedman has stated: “If copying is difficult and expensive, intellectual property protection may be unnecessary.” See David Friedman, Standards as Intellectual Property: An Economic Approach, 19 U. DAYTON L. REV. 1109 (1994). As a corollary, when certain forms of intellectual property protection are unavailable, owners of information will if possible try to render copying more difficult.
price. To confront the liberated decompiler, computer software manufacturers may be encouraged to invest in elaborate and wasteful security methods to control access to their products. Manufacturers may write the sensitive parts of their code in a manner which renders disassembly more difficult or makes the disassembled code more difficult to understand. If more resources are invested in security, the costs of production will rise for both the software owner and those attempting to gain access to the program through decompilation. These costs will be passed on to the consumer. Apart from the effect on consumer welfare, the Sega case will further encourage the use of self-help technological hurdles (such as the very lock-out devices in Sega) to impede reverse engineering.

In addition to these technological hurdles, companies will make renewed efforts to bind prospective licensees, and others, by contractual means, to discourage dissemination of the underlying functioning of the program. These contractual provisions, already common in the industry, will become ever more popular after Sega. In this way, the result of Sega may well be a rise in transaction costs for both users and producers, thereby undercutting the pro-access policy the court so strongly advocated.

Thus, legal and technological impediments will restrict access to the underlying ideas and structures of the program which are necessary to develop compatible or non-infringing programs and will increase the costs of production for all concerned. It is difficult to measure whether these costs will outweigh the benefits of accelerated cumulative innovation that Sega encourages. Whether these attempts will constitute copyright misuse (a method of extending the grant of copyright beyond permissible limits) must be examined in relation to underlying policies of copyright law.

44. Sometimes that price is too high. So if denial of legal protection will result in the producer substituting equally effective or more costly alternatives, costs of non-protection outweigh the costs of protection under copyright or patent. For the economics of trade secrets, see David Friedman et al., Some Economics of Trade Secret Law, 5 J. ECON. PERSP. 61 (1991).

45. See Bob Edgar, Shielded Code: How to Protect Your Proprietary Code From Disassemblers, COMPUTER LANGUAGE, June 1991, at 65-71. Companies may also be induced to reward official licensees by changing the program in ways which would exclude unofficial licensees from the latest version of the base unit.

46. This is the opposite of what one would normally expect. One argument against conferring property rights on intellectual property is that costs of transactions are raised when a user must negotiate with the copyright owner. As David Friedman has pointed out, these costs are significant when there are multiple owners or the rights are vaguely defined. See Friedman, supra note 43. But in the computer software field the opposite may occur when software owners use contractual methods to raise the costs of access to the information in question.

47. One possible result of increased compatible products is that companies would try to raise the initial cost of the base unit rather than wait to obtain their profits through the sale of cartridges.
III. COPYRIGHT MISUSE AND COMPETITIVE POLICY

A. Misuse Generally

The misuse defense began as an affirmative defense to a suit for patent infringement based upon failure to pay royalties due under a patent licensing agreement. In patent law, the misuse defense was developed as a means to prevent patent owners from using the market power in their patents to restrain competition in other unpatented products through tie-ins and other restrictive licensing arrangements. The Court of Appeals of the Federal Circuit summarized the doctrine of patent misuse as follows: “The concept of patent misuse arose to restrain practices that did not in themselves violate any law, but that drew anticompetitive strength from the patent right, and thus were deemed to be contrary to public policy.”

The policy behind the doctrine arises from the limited scope of the monopoly granted to an inventor in return for the public’s receipt of the benefits of an invention. The defense was designed to create a balance between the incentives created by the patent system, and constraints on the patentee from using that power to extend the monopoly beyond the specific terms of the grant. For example, in the leading case Morton Salt Co. v. G.S. Suppiger, the Supreme Court refused to enforce plaintiff’s patent for a salt tablet dispensing machine used in the canning industry, because the plaintiff conditioned the lease of its patented machines on use of unpatented salt tablets produced by plaintiff’s subsidiary. The Court found misuse because plaintiff was attempting to extend its exclusive right beyond the scope of the patent grant by attempting to use his power in the market for the patented machine to leverage the salt market. Whether this competitive effect did or could have occurred is a matter of debate. The case, however, illustrates the per se nature of the misuse doctrine.

The misuse defense can be viewed as an equitable “unclean hands” defense. When successfully asserted, the patent misuse de-
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fense will prevent patent enforcement and the award of a remedy for infringement. Once misuse is found, a patentee found guilty of the misuse may not enforce the patent against infringers until the misuse has been discontinued and its harmful effects have been eliminated. Moreover, the consequences of a positive finding of misuse may extend beyond the parties to the suit. An individual defendant raising a patent misuse defense need not show he was personally harmed by the abusive practice.

The policy justification for the misuse doctrine is based on the limited monopoly right conferred on patentees "to exclude others from making, using, or selling the invention throughout the United States." The misuse doctrine is derived from a basic assumption that the patent monopoly is restrictive on a free economy. The doctrine is applied because of a perceived necessity and a deeply ingrained perception about the patent system. The goal of the doctrine is to prevent the patent holder from extending benefits not contemplated by the grant through use of such competitively suspect activities as tie-ins and exclusive dealing arrangements. Although it governs competitive practices addressed by the antitrust laws, the misuse defense has retained a separate identity, albeit uncertain.

B. The Misuse Defense as Distinct From Antitrust Law

Although it is based on principles of free competition, the misuse doctrine has an identity distinct from antitrust laws. Most courts have declared that the misuse defense does not require proof of an antitrust

 clauses. The tie-out provisions conditioned the license of its lock out program on the licensee's agreement not to produce games for any other home video system for two years after the first sale of any Nintendo-compatible game. The court declared that because the misuse defense is equitable, it could only be asserted by one with clean hands. Atari, however, did not have clean hands because it had misled the Copyright Office to procure a copy of Nintendo's registered program; it could not assert the defense. Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832, 846 (Fed. Cir. 1992).

56. A tie-in is a form of misuse or antitrust violation in which the license or purchase of item A is conditioned on the license or purchase of separate item B. This can be a violation of the Clayton Act or the Sherman Act or constitute misuse of intellectual property that will deny relief in an infringement suit. Northern Pacific Ry. Co. v. United States, 356 U.S. 1, 6 (1958). Accolade based its unsuccessful misuse defense on unnamed tying allegations. Sega Enters., Ltd. v. Accolade, Inc., 785 F. Supp. 1392, 1399 (N.D. Cal. 1992), aff'd in part, rev'd in part, 977 F.2d 1510 (9th Cir. 1993).
This has made the misuse doctrine extremely attractive to a defendant in a patent dispute. By asserting misuse, a defendant may circumvent certain difficult aspects of proving an antitrust violation. In general, to prove an antitrust violation, one must show conduct constituting a restraint of trade that would unreasonably harm competition in a relevant market. But neither proof of market power, nor competitive injury is necessary to prove misuse. In addition to proving market power, an antitrust claimant must meet a standing requirement that requires proof of injury "of the type the antitrust laws were intended to prevent and that flows from that which makes the defendant's acts unlawful." Proof of standing is not required to prove patent misuse. A defendant in an infringement action is shielded from suit if he can show patent misuse, even though the acts of misuse neither constitute competitive injury nor indicate that the plaintiff was individually harmed by the defendant's misuse. Thus, a successful misuse defense can bar enforcement of a copyright or patent, despite that conduct's tangential relationship to the infringement action.

There are other differences between misuse and an antitrust violation. An antitrust violation is a counterclaim giving rise to damages, whereas misuse is an absolute defense to an allegation of patent or copyright infringement. Further, an alleged infringer cannot avoid paying damages for engaging in infringing activities by counterclaiming under the antitrust laws. By contrast, the defendant in a misuse claim must prove only that the plaintiff has extended his property right beyond the patent or copyright.


59. Seiffhart, 803 F.2d at 661.


63. Despite these differences, some courts do not clearly make the distinction between misuse and antitrust violations. For example, in Bellsouth Advertising and Publishing Corp. v. Donnelley Info. Publishing Corp., Donnelley alleged that Bellsouth had overextended its copyright by restricting competing directory companies from using the factual information in its yellow pages, 719 F. Supp. 1551, 1562-63 (S.D. Fla. 1988), rev'd, 999 F.2d 1436 (11th Cir. 1993), cert. denied, 114 S. Ct. 943 (interim ed. 1994). The court declined to apply the misuse doctrine in this copyright infringement action, because it found that Bellsouth had not overextended its copyright and, therefore, there was no antitrust violation. Id.
The patent misuse doctrine has received sharp criticism from commentators and industry groups. Because the misuse doctrine is based on vague principles that overlap antitrust law, it is said to reduce the incentive to innovate while discouraging pro-competitive licensing practices that disseminate patented technology. The misuse doctrine, distinct from antitrust principles, has had some supporters. For example, Robert Merges asserts that an equitable doctrine preventing unfair extensions of patents (such as the misuse doctrine), offsets other pro-patentee doctrines that effectively extend patents, such as the doctrine of equivalents. In other words, a doctrine such as patent misuse is needed to temper the natural tendency of patent owners for extending the proper boundaries of their highly exclusionary grant. Nonetheless, one can find in the literature little enthusiasm for the misuse doctrine.

In late 1988, legislation almost terminated the patent misuse defense by prohibiting a finding of patent misuse unless the patentee's practices violated the antitrust laws. The ultimate version of this legislation produced a compromise amendment to the patent law. The misuse amendment incorporated rule of reason analysis for misuse when the patentee refuses to license a patent or conditions the license of the patent on the licensee's purchase of another product. With this amendment, drafted in response to persistent criticism of the misuse doctrine, the doctrine of patent misuse, independent of antitrust law, is of questionable viability. The doctrine of patent misuse is not dead and a possibility exists that it may again flourish. Whatever the post-amendment status of patent misuse, Congress apparently wished to go no further, leaving untouched the corresponding doctrine of copyright misuse. The legislative history, however, is ambiguous. Statements in the record of the misuse amendment indicate that while the amend-


66. The Rule of Reason applies "unless . . . the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned." 5 U.S.C. § 271(d)(5) (1988).

67. The demise of the misuse doctrine in patent law is consistent with current trends in antitrust law to view licensing restrictions without the jaundiced eye of yesteryear. In the early 1970s the Justice Department issued the famous nine "no no's" constituting illegal licensing practices. These licensing practices that the Justice Department considered to be per se illegal under the antitrust laws were substantially similar to practices held to constitute misuse. In the 1980s, the Justice Department took a 180-degree turn in its attitude toward antitrust scrutiny of licensing arrangements, finding previously considered per se violations to be generally pro-competitive.
ment should not affect existing copyright law, the misuse defense has even less of a rationale in copyright than in patent law.68

C. The Lasercomb Case and Copyright Misuse

Whereas the misuse defense has had a rich but troubled tradition in patent law, misuse has been given little recognition in copyright law. Allegations of copyright misuse have rarely succeeded. Even though the defense has been acknowledged in several cases,69 no Supreme Court decision has firmly established a copyright misuse defense analogous to patent misuse. In fact, before the Lasercomb case, only one court had actually relied on the misuse defense to prevent enforcement of a valid copyright against infringers.70

Considering the tradition against the misuse defense in copyright law, the Fourth Circuit decision in Lasercomb America, Inc. v. Reynolds,71 is significant. Finally, a Court of Appeals applied the doctrine of misuse to a copyright case. Lasercomb was a software licensor who included, in at least one license agreement, a restrictive covenant which precluded licensees from participating, in any manner, in the development of competitive software for ninety-nine years. The court discussed the history of both patent misuse and copyright misuse and concluded:

[t]he similarity of the policies underlying patent and copyright is great and historically has been consistently recognized. Both patent law and copyright law seek to increase the store of human knowledge and arts by rewarding inventors and authors with the exclusive rights to their works for a limited time. At the same time, the granted monopoly power does not extend to property not covered by the patent or copyright.72

Equating the patent monopoly with that of copyright is questionable, but Lasercomb is unequivocal on the full application of the misuse doctrine to copyright law.

The question after Lasercomb is whether copyright misuse can be asserted against a software owner that uses contractual or technological impediments to reverse engineering. In other words, to what extent can

71. 911 F.2d 970 (4th Cir. 1990).
72. Id. at 976.
copyright owners employ self help attempts to undercut the benefits of
the fair use privilege? This kind of contractual restriction or technological
hurdle differs from the arrangements deemed to constitute copy-
right misuse in Lasercomb because they are not attempts to extend the
duration of the grant. Under Sega's anti-monopoly rationale, however,
such restricting may be construed as an attempt to circumvent a right
of access necessary for reverse engineers to exercise effectively the fair
use privilege. Although Accolade raised other misuse claims without
success, it did not assert that the technological lock-out devices used by
Sega constituted copyright misuse. This comes as a paradox: if one
accepts the premises of Sega's anti-monopoly underpinnings, Sega's
self-help technological lock out techniques may have constituted the
strongest claim for copyright misuse.

D. Contractual and Technological Methods to Impede Reverse
Engineering

Contractual provisions restricting reverse engineering are the most
obvious and traditional method to obstruct reverse engineering. They
are quite common and are found in both negotiated licenses and those
characterized as "shrink wrap licenses." Setting aside the enforceabil-
ity of shrink wrap licenses, the logic of Sega may encourage misuse
arguments as a defense to copyright infringement. As such, these con-
tractual provisions may plausibly be construed as attempts to unduly
extend the grant of copyright by preventing access to uncopyrightable
ideas. Contractual provisions may be viewed in Sega language as an
attempt to preclude public access to functional elements in the work
and to confer a de facto monopoly over those ideas and functional
concepts.

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73. Sega Enters., Ltd. v. Accolade, Inc., 785 F. Supp. 1392, 1399 (N.D. Cal. 1992), aff'd in
part, rev'd in part, 977 F.2d 1510 (9th Cir. 1993). Like Sega, misuse was also asserted without
success in Atari. Atari Games Corp. v. Nintendo of Am., Inc., 975 F.2d 832, 846 (Fed. Cir.
1992). Similarly, Atari did not raise a misuse defense for Nintendo's lock-out devices. Id.

74. See Charles R. McManis, Intellectual Property Protection and Reverse Engineering of
Computer Programs in the United States and the European Community, 8 HIGH TECH. L.J., 25,
65 (1993) (Professor McManis argues that Sega's anti-monopoly rhetoric suggests that Sega's use
of the lock out devices constituted a misuse of copyright).

75. See generally, David Einhorn, The Enforceability of "Tear Me Open" Software License
Agreements, 67 J. PAT. & TRADEMARK OFF. SOC'Y, 509 (1985); Gary W. Hamilton and Jeffrey C.
1993); see also Vault v. Quaid Software Ltd., 847 F.2d 255 (5th Cir. 1988) (certain provisions of
shrink wrap license were preempted by Copyright Act). For a comprehensive overview of the
subject see David A. Rice, Private Contract, Public Goods, and Public Policy: Federal Preemp-
tion of Software License Prohibitions Against Reverse Engineering, 53 U. PITI. L. REV. 543

76. Sega, 977 F.2d at 1523.
As an alternative to relying on a contractual provision to prevent purchasers or licensees from reverse engineering, a software vendor could try to achieve the same results by technological means, incorporating into the software a routine to preclude or impede copying. Technological self help (or lock-out) methods, if successful, raise entry barriers to potential competitors by increasing costs of reverse engineering. Under an expansive misuse rationale, there is no reason why this conduct should be treated any differently than a contractual prohibition on copying since the purpose and result would be the same. Technological methods would, in Sega's terms, defeat the purpose of the Copyright Act. The Act is designed to encourage the production of original works by protecting the expressive elements of those works while leaving the ideas, facts, and functional concepts in the public domain for others to build on. Technological hurdles may be viewed as impoverishing the public and depriving access to those wishing to use the essential building blocks needed to produce compatible or other non-infringing works. As with the contractual prohibition, the first issue under copyright law is whether the technical impediment prevents the purchasers or licensees from doing something they would otherwise be able to do under the fair use doctrine. If so, copyright misuse might be a plausible defense. Although the misuse argument may have an attractive surface appeal, a full-blown recognition of the misuse defense is ill-fitted to copyright law and would play havoc with the commercial realities of the computer software industry.

A misuse defense recognized in copyright law would undermine many of the current licensing practices existing in the software industry, thus causing uncertainty in commercial relationships. Computer software licenses are often drafted to protect both copyright and trade secrets embodied in the same program. These licenses almost invariably prohibit the licensee from copying the program, or reverse engineering it, to obtain a form accessible to human comprehension. Moreover, the licenses do not distinguish between the copyrighted expression and uncopyrighted ideas of the work. The reason is a practical one: No technologically feasible way to separate these two rights exists. As discussed above, it is impossible to gain access to the unprotected elements of a program without simultaneously copying the protected elements as well. Here, one might argue that the copyright owner is trying to leverage the copyright beyond the terms of the grant and has thus committed copyright misuse. Such arguments, however, do not recognize the highly integrated nature of computer software. In addition, these argu-
ments improperly equate the strength of the copyright monopoly with that of the patent monopoly.

Using technological restraints that would restrict reproduction cannot be limited to the copyrightable expression embodied in the code. Moreover, these restraints are specifically designed to keep others from copying the ideas embodied in the work—ideas that often constitute valuable trade secrets, developed at great expense. In addition to breeding uncertainty into commercial relationships, full-blown recognition of copyright misuse would amount to an enforced disclosure of the expressive aspects of the work and could well lead to the destruction of trade secret rights.

E. Copyright Misuse as Enforced Disclosure

The essential question is whether a misuse defense would benefit consumer welfare by promoting the optimal production and dissemination of computer works. My conclusion is that such a turn would constitute an unfortunate development in the law that would risk undermining the goals of copyright law. To reinvigorate a misuse defense in copyright law would upset the delicate balance between the incentive to create works of authorship and the dissemination function of copyright as embodied in the fair use doctrine. A misuse defense extended to efforts of software owners to impede reverse engineering would amount to a policy of de facto enforced disclosure of the software, including the trade secrets embodied in it. Some have vigorously maintained that disclosure of the expression and ideas embodied in software should be a prerequisite for copyright protection. Dennis Karjala, and others, have argued that total disclosure of all aspects of computer software is a quid pro quo mandated by section 102(b) of the Act and by constitutional fiat. This goes too far. Nothing in the Copyright Act or the Constitution mandates disclosure. Section 102(b) of the Act forbids copyright protection for certain aspects of expressive works but does not require access be provided for these unprotectable elements. Whatever the merits of the argument favoring disclosure, achieving disclosure through an invigorated copyright misuse defense is improper. Recognition of misuse in these circumstances would have a perverse economic effect on the production and distribution of commercial software. Enforced disclosure would often strip the program of its economic worth and discourage software developers from producing new works.

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Perhaps the most serious result of enforced disclosure through a misuse defense would be an undermining of the relationship between the copyrightable subject matter and the trade secrets embodied in the object code.\(^{80}\) Although the interplay of trade secret and copyright remains an area in limbo, both the courts\(^{81}\) and the Copyright Office have proclaimed that the two forms of intellectual property are not mutually exclusive. To assure protection of proprietary information, the Copyright Office has established special procedures in their deposit requirements for software bearing trade secrets.\(^{82}\) Moreover, trade secret rights are not *ipso facto* preempted by the Copyright Act.\(^{83}\) Very often trade secrets coexist in a software program and constitute the most valuable aspect of the program.\(^{84}\) Although trade secrets, are basically ideas and cannot be protected under copyright law, they can be protected by contract or other means, thus protecting them from improper appropriation.\(^{85}\)

If the misuse defense is used to effectively impede efforts of software owners to protect their trade secrets, either by licenses or technological security devices, the result will impose a heavy burden on the software owner. If software owners hesitate in disseminating their work for fear of losing their trade secrets the result may be harm to consumer welfare. Increased trade secret vulnerability would raise the cost of producing the software. Higher costs would either be passed on to consumers in the form of higher prices or would force non-production of some works.

**IV. Conclusion**

Full recognition of the copyright misuse defense as applied by efforts of software owners to impede reverse engineering would be an unfortunate development. It would be a paradox if the misuse defense were engrafted into copyright law after Congress has virtually termi-

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81. See GCA Corp. v. Chance, 217 U.S.P.Q. 718 (N.D. Cal. 1982); see also Technicon Medical Info. Sys. Corp. v. Green Bay Packaging, Inc., 687 F.2d 1032 (7th Cir. 1982) (copyright notice does not estop a copyright owner from asserting trade secret rights).


84. See FINDING A BALANCE, supra note 13, at 82.

85. A trade secret may be defined as "any information that can be used in the operation of a business or other enterprise and that is sufficiently valuable and secret to afford an actual or potential economic advantage over others." RESTATEMENT OF UNFAIR COMPETITION § 39 (Tent. Draft #4 Mar. 25, 1993). Numerous court cases have protected trade secrets in computer software. See, e.g., Telex Corp. v. International Business Mach. Corp., 510 F.2d 984 (10th Cir.), *cert. dismissed*, 423 U.S. 802 (1975).
nated the misuse defense as a viable doctrine in patent law. There exist even fewer reasons to extend misuse principles to copyright law. Historically, courts have been less inclined to sanction the misuse defense in copyright infringement cases than in patent cases. This position rests on a fundamental difference between the patent and copyright grants. A copyright, even more so than a patent, is a legal rather than an economic monopoly. The rationale for the misuse defense is even weaker in copyright law, since the exclusionary force of the monopoly is less than in patent law. Persons create copyrighted works hoping to charge supracompetitive prices for the work. This can only result if consumers are willing to pay the supracompetitive price instead of seeking satisfactory substitutes. If these substitutes are available, the seller of the work will enjoy no economic power in the market for the work. Generally, works of computer software are (as is the case for most copyrighted works) highly substitutable. Dozens of software programs may compete at any one time for the consumer’s dollars. Although copyright law may prohibit copying, this constraint in itself does not necessarily lead to market power. As a result, the copyright grant will not confer the degree of market power that the patent grant confers and that the patent misuse cases presuppose. For this reason, claims that the copyright owner has sought to extend his copyright beyond its proper scope have fallen on deaf ears. Courts have properly looked to antitrust law as the sole regulator of anti-competitive conduct. Judge Posner has aptly characterized the misuse doctrine in patent law: “If misuse principles are not tested by conventional antitrust principles, by what principles shall they be tested? Our law is not rich in alternative concepts of monopolistic abuse and it is rather late in the day to develop one without subjecting the rights of patent holders to debilitating uncertainty.”

86. Legislative history indicates that the patent misuse reform should not affect existing copyright law, but the statements of legislators advocate the complete elimination of the “vague and tenuous” doctrine of copyright misuse. See 133 CONG. REC S10275 (daily ed. July 21, 1987) (statements of Senators DeConcini and Hatch).
88. See Paul Goldstein, Infringement of Copyright in Computer Programs, 47 U. PITT. L. REV. 1119, 1128 (1986).
89. Even in the case of patents, most economists have agreed that few of the thousands of patents granted every year truly confer economic power. See F. Sherer & D. Ross, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 622 (1990).
90. USM Corp. v. SPS Tech., Inc., 694 F.2d 505, 512 (7th Cir. 1982), cert. denied, 462 U.S. 1107 (1983).
rights and contractual arrangements governing a complex and ever changing computer software industry.