



1982

# Proprietary Protection of Computer Software

James P. Chandler

*NIPLI (National Intellectual Property Law Institute)*

Follow this and additional works at: <http://scholarworks.law.ubalt.edu/ublr>



Part of the [Law Commons](#)

### Recommended Citation

Chandler, James P. (1982) "Proprietary Protection of Computer Software," *University of Baltimore Law Review*: Vol. 11: Iss. 2, Article 2.  
Available at: <http://scholarworks.law.ubalt.edu/ublr/vol11/iss2/2>

This Article is brought to you for free and open access by ScholarWorks@University of Baltimore School of Law. It has been accepted for inclusion in University of Baltimore Law Review by an authorized administrator of ScholarWorks@University of Baltimore School of Law. For more information, please contact [snolan@ubalt.edu](mailto:snolan@ubalt.edu).

# UNIVERSITY OF BALTIMORE LAW REVIEW

Copyright © by The University of Baltimore Law Review. All rights reserved

---

Volume Eleven

Winter 1982

Number Two

---

## PROPRIETARY PROTECTION OF COMPUTER SOFTWARE

James P. Chandler†

*Due to the rapid development and technological complexity of computer software, courts and legislatures have experienced great difficulty in adapting the law so as to provide adequate proprietary protection for such products. In this article, the author discusses the physical and legal safeguards available to software manufacturers and the remedies they may obtain when these safeguards fail.*

### I. THE NEED FOR PROPRIETARY PROTECTION

Since the initial development in 1953 of computer software for commercial use,<sup>1</sup> the software industry has burgeoned. The dollar value of transactions in computer software has now surpassed that of hardware sales, and software is at the same time drawing the most research attention. The number of hardware manufacturers remains relatively few, but software companies continue to spring up rapidly. This commercial scene exists even though entry and continued success in the software field require great and continuously developing expertise, large amounts of capital are necessary for research and development, and skilled programmers and software developers are in short supply.

These circumstances, together with the ever-increasing demand for computer products and the relatively low cost of copying software, set the stage for the industry's present concern about ways of safeguarding against misappropriation of its products. If software producers are to have the incentive to continue exerting their efforts in much needed software development and to realize the return on their financial investments necessary to attract investment capital, they require assur-

---

† A.B., University of California at Berkeley, 1963; J.D., University of California School of Law at Davis, 1970; LL.M., Harvard Law School, 1971; Professor of Law and Director of Computer Law Institute, The George Washington University National Law Center. The assistance of Ms. Phyllis Thompson, Class of 1981, The George Washington University National Law Center, Ms. Marleen Bleich Miller, Class of 1982, University of Baltimore School of Law, and Mr. Michael G. Gallerizzo, Class of 1983, University of Baltimore School of Law, is gratefully acknowledged.

1. See Scafetta, *Computer Software Protection: The Copyright Revision Bills and Alternatives*, 8 J. MAR. J. PRAC. & PROC. 381 (1975).

ance, in the form of legal protection, that the industry will be free from unfair competition by both established and aspiring competitors. Thus, the growth of the computer industry brings with it not only special legal problems stemming from procurement, such as the scope and effect of warranties and disclaimers,<sup>2</sup> but also the need for novel application of established doctrines and development of new laws for the proprietary protection of software manufacturers. This protection will need to extend to both computer programs (operating instructions for computer systems) and data bases (compilations of reference and other kinds of information stored in computers). Furthermore, if access of competitors is to be cut off, manufacturers must be able to protect themselves not only from unauthorized appropriation by rivals, but by visitors, customers and employees as well.

Manufacturers have already taken steps to prevent misappropriation of their products. Computer plants carefully screen their visitors and forbid them access to areas where manufacturing secrets are stored, restrict access to data bases by the use of passwords that enable only licensees to retrieve information, and intentionally feed erroneous or nonsensical information into storage so that misappropriated data compilations can be readily detected. Plant employees are carefully screened before hiring, and many of them are restrained from entering plant areas not vital to the performance of their tasks and apt to contain industrial secrets. Employees may also be periodically required to produce inventory accounts so that they will be less tempted to siphon off software. Furthermore, various company properties remain locked in confidential files. Moreover, it is recommended that employees be well-paid to avoid their being easily tempted by the offers of competitors, willing to pay attractive sums for access to know-how.<sup>3</sup>

Since customers, too, may leak secrets to which they have become privy, manufacturers must take special action to protect against their disclosures. Such precautions may include leasing instead of selling computer software so that manufacturers can continue to exercise some control over the uses to which their products are put. As lessors, they should put proprietary notices on both programs and data displays so that customers will be aware of the manufacturers' proprietary claims. Whenever possible, lessors should furnish lessees object programs, geared to the lessee's particular use, rather than source programs.<sup>4</sup>

---

2. See Chandler, *Computer Transactions: Potential Liability of Computer Users and Vendors*, 1977 WASH. U. L.Q. 405, 431-35.

3. Scafetta, *Computer Software and Unfair Methods of Competition*, 10 J. MAR. J. PRAC. & PROC. 447, 463 (1977). For other safety measures, see Allen, *Danger Ahead! Safeguard Your Computer*, HARV. BUS. REV., Nov.-Dec. 1968, at 97.

4. *Data Cash Sys., Inc. v. JS&A Group, Inc.*, 480 F. Supp. 1063, 1065, 7 Computer L. Serv. Rep. (Callaghan) 1004, 1005-06 (N.D. Ill. 1979), *aff'd on other grounds*, 628 F.2d 1038, 7 Computer L. Serv. Rep. (Callaghan) 1438 (7th Cir. 1980).

Normally, a computer program consists of several phases which may be summarized as follows. The first phase is the development of a flow

Customers should be required to take affirmative steps to guard against disclosure of proprietary information as they make rightful use of their leased materials. Finally, manufacturers should require that both employees and customers expressly promise not to disclose processes or know-how or to use these secrets for the purpose of competing.

When these precautions fail to prevent misappropriation, manufacturers require the aid of the courts in protecting their investments. Both injunctive relief and monetary damages are recoverable under a variety of legal theories, some statutory and others judicially fashioned products of the common law. Plaintiffs may be protected by the sanction of criminal penalties or may obtain civil relief in federal court, under the trademark, copyright, or patent laws, or in state court, based on contract, quasi-contract, trade secret, misappropriation, or unfair competition doctrines. This article discusses the availability, requirements, scope, and relative advantages of the protection these various bodies of law offer to the proprietor of computer software.

## II. PRE-EMPTION

It is important to note at the outset the effect that federal pre-emption may have on the availability of state protection and remedies. Pre-emption occurs whenever Congress has so legislated in an area that the effectiveness of its legislation and the purpose behind it would be frustrated by independent state attempts to regulate or afford remedies in the same area.<sup>5</sup> States are then precluded from applying the regulations and remedies they have fashioned. Congress has afforded pervasive protections and remedies to authors, inventors and merchants through enactment of the federal copyright, patent and trademark laws. Consequently, states may not grant equivalent protection to subject matter within the scope of these federal laws.<sup>6</sup> Thus, for example, common law copyright, whereby an author acquired upon the creation of

---

chart which is a schematic representation of the program's logic. It sets forth the logical steps involved in solving a given problem. The second phase is the development of a "source program" which is a translation of the flow chart into computer programming language, such as FORTRAN or COBOL. Source programs may be punched on decks of cards or imprinted on discs, tapes or drums. The third phase is the development of an "assembly program" which is a translation of the programming language into machine language, *i.e.*, mechanically readable computer language. Unlike source programs, which are readable by trained programmers, assembly programs are virtually unintelligible except by the computer itself. Finally, the fourth phase is the development of an "object program" which is a conversion of the machine language into a device commanding a series of electrical impulses. Object programs, which enter into the mechanical process itself, cannot be read without the aid of special equipment and cannot be understood by even the most highly trained programmers.

*Id.*

5. *Sola Elec. Co. v. Jefferson Co.*, 317 U.S. 173, 176-77 (1942).

6. J. NOWACK, *HANDBOOK OF CONSTITUTIONAL LAW* 267 (1978); Nimtz, *Develop-*

his work exclusive rights to copy it until it was published, has been largely abolished by the federal copyright statute.<sup>7</sup>

Nevertheless, other forms of non-federal proprietary protection remain available. The much-discussed case of *Kewanee Oil v. Bicron Corp.*<sup>8</sup> is authority for the rule that a state may provide a remedy for misappropriation of trade secrets even in cases in which the "secret" process or technique so protected was appropriate for patent protection, but no patent had been applied for.<sup>9</sup> The United States Supreme Court in *Kewanee* noted that both the encouragement of patent applications and the granting of patent protection were necessary to foster full disclosure of new inventions and technologies and to avoid useless duplication of effort.<sup>10</sup> It was held, however, that states maintain an interest in fostering commercial ethics and in encouraging the kinds of effort and expenditure involved in inventions that do not rise to the level of novelty and nonobviousness required for federal patent protection.<sup>11</sup> The Court was not persuaded by the argument that inventors would be dissuaded from seeking federal patents because of the availability of state remedies;<sup>12</sup> it believed that the greater benefits of the patent laws (*inter alia*, exclusive rights to use or license the patented process, even in the event of independent re-inventions) would provide inventors sufficient incentive to seek patents.<sup>13</sup>

Relying on *Kewanee*, the Supreme Judicial Court of Massachusetts, in *Analogic Corp. v. Data Translation, Inc.*,<sup>14</sup> afforded injunctive relief against use of computer trade secrets.<sup>15</sup> In that case, it was reasoned that both decency and the high cost incurred in protecting against misappropriation warranted application of the state trade secret laws.<sup>16</sup> Accordingly, former employees of Analogic were enjoined from using the specific know-how they had acquired to build a copy of Analogic's high speed data acquisition module when they formed their own competing business.<sup>17</sup>

---

*ment of the Law of Computer Software*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-1, art. 6, at 297, 313-14 (1980).

7. H.R. REP. NO. 94-1476, 94th Cong., 2d Sess. 129-30, reprinted in [1976] U.S. CODE CONG. & AD. NEWS 5659, 5745; see 17 U.S.C. § 301 (Supp. IV 1980).

8. 416 U.S. 470 (1974).

9. *Id.* at 491-92. Although state trade secret law is not pre-empted by federal patent law, state unfair competition law may be pre-empted by federal design patent law. See *Compco Corp. v. Day Brite Lighting, Inc.*, 376 U.S. 234 (1964).

10. 416 U.S. 470, 480 (1974).

11. *Id.* at 481-84.

12. *Id.* at 484-85.

13. *Id.* at 489-91.

14. 371 Mass. 643, 358 N.E.2d 804, 6 Computer L. Serv. Rep. (Callaghan) 345 (1976).

15. *Id.* at 646-47, 358 N.E.2d at 806-07, 6 Computer L. Serv. Rep. (Callaghan) at 347.

16. *Id.* at 646, 358 N.E.2d at 806, 6 Computer L. Serv. Rep. (Callaghan) at 347.

17. *Id.* at 647, 358 N.E.2d at 807, 6 Computer L. Serv. Rep. (Callaghan) at 347-48. The facts, as presented, were insufficient for the court to determine whether a permanent injunction should be granted. *Id.* at 647, 358 N.E.2d at 807, 6 Computer L. Serv. Rep. (Callaghan) at 348-49.

Additionally, federal proprietary laws do not preclude states from enforcing contractual arrangements initiated by manufacturers to protect their non-patented inventions. For example, in *Painton & Co. v. Bourns Inc.*,<sup>18</sup> the United States Court of Appeals for the Second Circuit held that pursuant to state law an exclusive licensing agreement, which placed limitations on the licensee's use of certain engineering and manufacturing techniques, could be enforced although no patent application had been filed.<sup>19</sup> Upon termination of the agreement, the licensor, Bourns, was able to recover license payments due under the contract.<sup>20</sup> Bourns was also entitled to a trial to prove its allegation that, based on the contract, the licensee, Painton, no longer had the right to use the information supplied by Bourns—information Bourns alleged to involve trade secrets.<sup>21</sup>

Non-federal remedies thus remain available to software manufacturers whose proprietary rights have been infringed. Still, it may be difficult to determine whether, in a particular case, the state protection sought is the equivalent of federal protection and is thus pre-empted.<sup>22</sup> For example, while it has been suggested that an action based on misappropriation of a computer data base may be a proper subject for federal copyright law and, therefore, no longer possible under the common law,<sup>23</sup> it has also been held in a computer software case that an action based on breach of trust or confidentiality is not pre-empted.<sup>24</sup>

### III. PROPRIETARY PROTECTION UNDER STATE LAW

#### A. Criminal Sanctions

Although manufacturers may have recourse to state criminal law sanctions to protect their computer property, access to such remedies has not come without difficulty. The stumbling block has been that computer property so valuable to manufacturers and their competitors may not qualify as property under a state theft or larceny statute.<sup>25</sup> Furthermore, the means employed to misappropriate such property may not constitute the requisite "taking" or "carrying away."<sup>26</sup> In such

---

18. 442 F.2d 216, 2 Computer L. Serv. Rep. (Callaghan) 558 (2d Cir. 1971).

19. *Id.* at 223, 2 Computer L. Serv. Rep. (Callaghan) at 571. *Cf. Lear v. Adkins*, 395 U.S. 653 (1969) (if a licensee is contesting the validity of a patent, the license agreement will be enforced only if the validity of the patents is established).

20. 442 F.2d 216, 223, 2 Computer L. Serv. Rep. (Callaghan) 558, 571-72. (2d Cir. 1971).

21. *Id.* at 233, 2 Computer L. Serv. Rep. (Callaghan) at 584.

22. *See, e.g.*, 8 COMPUTER L. & TAX REP., Dec. 1981, at 1, for a discussion of recent cases on whether § 301 of the Copyright Act pre-empts state protection of a software proprietor's trade secrets.

23. Bigelow, *Copyright in Computerized Data Bases*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-3, art. 3, at 6 (1972).

24. *Management Science America, Inc. v. Cyborg Syss., Inc.*, 6 Computer L. Serv. Rep. (Callaghan) 921 (N.D. Ill. 1978).

25. *See Lund v. Commonwealth*, 217 Va. 688, 691-92, 232 S.E.2d 745, 748 (1977).

26. The essential elements of larceny normally include actual or constructive taking

cases, criminal laws alone may provide no deterrent to the wrongful appropriation of computer software.

A case that illustrates the potential difficulty a software proprietor may encounter in seeking to have criminal laws applied is *Hancock v. State*.<sup>27</sup> In this Texas case, the defendant, a computer programmer, was charged with the theft of fifty-nine "documents in writing," *i.e.*, computer programs.<sup>28</sup> He had allegedly photocopied them and offered to sell them to his employer's competitor at a price of five million dollars, but he had never removed the originals of the programs from his employer's premises.<sup>29</sup> In defense, Hancock argued that the computer programs alleged to have been stolen did not constitute "corporeal personal property" and, therefore, could not be the subject of theft.<sup>30</sup> The Court of Criminal Appeals of Texas applied the state penal code's definition of property, which included "all writings of every description, provided such property possesses any ascertainable value."<sup>31</sup> It was concluded that computer programs fell within that definition.<sup>32</sup> The defendant's petition for habeas corpus relief, which averred that the only property he took—the photocopying paper—was of insufficient monetary value to justify his conviction for felony theft, was also unsuccessful.<sup>33</sup>

Although Texas criminal law was effective against Hancock, the uncertainty surrounding the application of theft and larceny statutes is made evident by that case. Many state theft statutes may not be as flexible in providing protection against misappropriation of the ideas contained in photocopies. It is conceivable that processes worth millions of dollars to their developers may occasion summary dismissals when they are the subjects of larceny trials.

Computer industry representatives have sought enactment of state criminal laws worded so broadly that they will be certain to attribute guilt to those who take intangible property such as computer programs. Furthermore, beginning in 1964, specific trade secret criminal statutes have been enacted in twenty-one jurisdictions, including most of the

---

and carrying away the goods of another, without consent and with felonious intent. *E.g.*, *People v. Goodchild*, 68 Mich. App. 226, 242, 242 N.W.2d 465, 468 (1976).

27. 402 S.W.2d 906, 1 Computer L. Serv. Rep. (Callaghan) 562 (Tex. Crim. App. 1966).

28. *Id.* at 907, 1 Computer L. Serv. Rep. (Callaghan) at 563.

29. *Id.* at 907, 1 Computer L. Serv. Rep. (Callaghan) at 564-65.

30. *Id.* at 908, 1 Computer L. Serv. Rep. (Callaghan) at 565.

31. *Id.* (quoting TEX. STAT. ANN. art. 1418 (Vernon 1925)). The definition of property in the current version of the statute includes "a document . . . that represents or embodies anything of value." TEX. PENAL CODE ANN. tit. 7, § 31.01(6)(c) (Vernon 1974).

32. 402 S.W.2d 906, 908, 1 Computer L. Serv. Rep. (Callaghan) 562, 565 (Tex. Crim. App. 1966).

33. *Hancock v. Decker*, 379 F.2d 552, 553, 1 Computer L. Serv. Rep. (Callaghan) 858, 859 (5th Cir. 1967).

leading industrial and technological states.<sup>34</sup> In states without such statutes, unless existing laws "can be interpreted to protect against misappropriation of the trade secret itself, as opposed to the article embodying it, appropriation of the former may not be criminal."<sup>35</sup>

The particular utility of criminal trade secret misappropriation law lies not only in the protection against theft of intangibles such as computer programs, but also in the protection against the unique methods of misappropriating computer property: reproducing by hand or photocopying; memorizing the software and then reproducing it away from the employer's premises; or even making and carrying away printouts of programs illegally retrieved from the computer's memory.<sup>36</sup> For example, in *Ward v. Superior Court*,<sup>37</sup> a computer service bureau employee was found guilty under California's trade secret theft statute for accessing a competitor's computer system by telephone, retrieving a program, printing it out at his own location, and then carrying the printout to his own office.

Even where exercised, criminal penalties alone may not provide a sufficient deterrent to software trade secret theft. The defendant in *Ward* received three years probation and was fined only five thousand dollars for stealing software valued at between ten and twenty-five thousand dollars.<sup>38</sup> However, his same deeds gave rise to a civil action in which the plaintiff service bureau recovered over \$300,000.<sup>39</sup> Therefore, it is not surprising that civil trade secret misappropriation actions are viewed by some as the optimum form of proprietary protection for computer software.

### B. Civil Actions

Many software proprietors have obtained relief in civil actions, based on a variety of legal theories. Plaintiffs have sought relief alleg-

---

34. Bender, *Trade Secret Software Protection*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-4, art. 2, at 16-17 (1977) [hereinafter cited as Bender]. Bender also observed:

There are no express federal trade secrets misappropriation criminal statutes, although there are statutes proscribing the transportation, or sale and receipt of stolen goods, wares, merchandise, securities or money. The principal element in determining whether these statutes preclude misappropriation of a trade secret is the determination of whether a trade secret falls within the statutory language.

*Id.* at 20. In Europe, however, specific trade secret criminal statutes have long been common. *Id.* at 14.

35. *Id.* at 16.

36. *Id.* at 9-19. For more examples of trade secret protection available to computer software, see *id.* at 19-20. But see *United States v. Bottone*, 365 F.2d 389 (2d Cir. 1966), in which the court indicated in dictum that memorizing a proprietor's trade secret and copying it down in another state would not constitute interstate transportation of stolen goods in violation of 18 U.S.C. § 2314 (1976 & Supp. III 1979). 365 F.2d at 393.

37. 3 Computer L. Serv. Rep. (Callaghan) 206 (Cal. Super. Ct. 1972).

38. Bender, *supra* note 34, at 19.

39. *Id.*



ing defendants' actions constituted unfair competition through use of wrongfully acquired trade secrets, breach of an implied obligation not to disclose or competitively use trade secrets to which the defendant had rightful access, or breach of express contractual agreements not to divulge confidential information or use it in proscribed ways. Successful litigants have been those able to prove the existence of a trade secret, its misappropriation and its use in competition. Those alleging breach of contractual commitments have also had to show that the contract provisions upon which they relied were not unenforceable.

Trade secrecy is a doctrine recognized in every American jurisdiction.<sup>40</sup> The *Restatement of Torts* defines a trade secret as "any formula, device or compilation of information which is used in one's business and which gives him an opportunity to obtain an advantage over competitors who do not know or use it."<sup>41</sup> This definition makes it clear that a trade secret must be of competitive value. In fact, a litigant may find that he can obtain no civil remedy for theft of a trade secret unless the secret has been put to some competitive use. As the United States Court of Appeals for the Fifth Circuit has noted, the purpose of trade secret law is to regulate unfair business competition, not to substitute for the criminal laws against theft.<sup>42</sup>

Nevertheless, competitive use may be found even when the defendant has not yet realized a profit from his misappropriation. In *University Computing Co. v. Lykes-Youngstown Corp.*,<sup>43</sup> the defendants' copying of plaintiff's automated inventory evaluation system constituted commercial and competitive use of the plaintiff's trade secrets because the defendants themselves had used the system and had represented the system to potential buyers as their own.<sup>44</sup> The court

---

40. *Id.* at 15-17.

41. RESTATEMENT OF TORTS § 757, Comment b (1939), *quoted in* *University Computing Co. v. Lykes-Youngstown Corp.*, 504 F.2d 518, 534, 5 Computer L. Serv. Rep. (Callaghan) 1248, 1258 (5th Cir. 1974). In Nimtz, *Development of the Law of Computer Software*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-1, art. 6, at 297 (1980), the author notes that this definition of trade secrets clearly affords protection for computer software. *Id.* at 313. The first *Restatement* explained that, generally, liability for use or disclosure of another's trade secrets arises where the appropriator:

- (a) . . . discovered the secret by improper means, or
- (b) [acted in such a way that] disclosure or use constitutes a breach of confidence reposed in him by [others] in disclosing the secret to him, or
- (c) . . . learned the secret from a third person with notice of the facts that it was a secret and that the third person discovered it by improper means or that the third person's disclosure of it was otherwise a breach of his duty to the other, or
- (d) . . . learned the secret with notice of the facts that it was a secret and that its disclosure was made to him by mistake.

RESTATEMENT OF TORTS § 757 (1939).

42. *University Computing Co. v. Lykes-Youngstown Corp.*, 504 F.2d 518, 539, 5 Computer L. Serv. Rep. (Callaghan) 1248, 1265 (5th Cir. 1974).

43. 504 F.2d 518, 5 Computer L. Serv. Rep. (Callaghan) 1248 (5th Cir. 1974).

44. *Id.* at 541, 5 Computer L. Serv. Rep. (Callaghan) at 1269.

believed that the defendants' inability to market the system was insignificant.<sup>45</sup> Additionally, the court held that the misappropriator of a trade secret need not be in present or potential competition with the plaintiff. He may compete merely in the sense that he has removed himself as a potential customer by putting the plaintiff's trade secret to use, without license to do so.<sup>46</sup>

The trade secret must not only have some impact on trade but, as the name indicates, it must also be secret.<sup>47</sup> It will remain the subject of legal protection only so long as its secrecy is maintained. However, trade secrets are not required to be so completely novel that no one else has ever utilized them. They may be quite widely disseminated and, yet, remain secrets if some effort has been made to limit their use and disclosure.

In *Data General Corp. v. Digital Computer Controls, Inc.*,<sup>48</sup> the designer of a minicomputer supplied customers with its design logic so that they could perform their own maintenance.<sup>49</sup> These widely distributed maintenance diagrams were accompanied, however, by proprietary legends and notices restricting use of the diagrams to maintenance needs. Customers were required to enter into confidentiality agreements. Consequently, when the defendants obtained the maintenance diagram from an original equipment manufacturer and used it to build a functionally equivalent computer, their defense that the plaintiff-designer had not taken adequate precautions to protect its trade secret failed.<sup>50</sup> Even in the presence of widespread distribution, the plaintiff's efforts to limit use and disclosure of its technical information were sufficient to invoke the trade secret doctrine.<sup>51</sup>

A software proprietor's internal precautions to guard his secret may also be important. In *Sperry Rand Corp. v. Pentronix, Inc.*,<sup>52</sup> the United States District Court for the Eastern District of Pennsylvania found the existence of a trade secret based upon evidence that documents relating to Sperry Rand's misappropriated magnetic memory core manufacturing process had been stamped "Company Confidential," that the doors to offices where such documents were stored were

---

45. *Id.* at 540, 5 Computer L. Serv. Rep. (Callaghan) at 1268.

46. *Id.*

47. *Id.* at 534, 5 Computer L. Serv. Rep. (Callaghan) at 1258. A protective order may be granted in cases in which a proprietor desires to safeguard against any unnecessary disclosure of software development during the pendency of a court action. *Electronic Assistance Corp. v. New York*, 362 F. Supp. 755, 758, 4 Computer L. Serv. Rep. (Callaghan) 945, 946-47 (S.D.N.Y. 1973); *United States v. IBM*, 60 F.R.D. 650, 652-53, 4 Computer L. Serv. Rep. (Callaghan) 486, 486-87 (S.D.N.Y. 1973); *Adams v. Dan River Mills, Inc.*, 54 F.R.D. 220, 222, 4 Computer L. Serv. Rep. (Callaghan) 33, 35 (W.D. Va. 1972).

48. 357 A.2d 105, 5 Computer L. Serv. Rep. (Callaghan) 1073 (Del. Ch. 1975).

49. *Id.* at 108, 5 Computer L. Serv. Rep. (Callaghan) at 1077.

50. *Id.* at 110-11, 5 Computer L. Serv. Rep. (Callaghan) at 1079-81.

51. *Id.* at 110-11, 5 Computer L. Serv. Rep. (Callaghan) at 1080-81.

52. 311 F. Supp. 910, 2 Computer L. Serv. Rep. (Callaghan) 600 (E.D. Pa. 1970).

locked, and that visitors to the Sperry plant were carefully screened.<sup>53</sup> In *Telex Corp. v. IBM*,<sup>54</sup> the United States Court of Appeals for the Tenth Circuit found that trade secret protection remained available even though IBM's object code was in daily, open, unrestricted use by employees since its more readily copyable source code was kept securely locked. Similarly, in *Com-Share, Inc. v. Computer Complex, Inc.*,<sup>55</sup> the United States District Court for the Eastern District of Michigan was influenced by the fact that the plaintiff had built passwords into its system to prevent unauthorized access and had kept its magnetic tapes and symbolics locked when not in use.<sup>56</sup>

In software cases, the courts may also be inclined to find the existence of trade secrets because of the general consensus among software companies that their products are secret, confidential and proprietary in nature. This belief is understandable, considering the large sums of capital expended in developing such products. "A court may well be persuaded by the amount of effort or money expended in developing the information in question, and the resulting value of that information."<sup>57</sup> Economic considerations may, in fact, be more important than secrecy or novelty in determining whether a trade secret exists.<sup>58</sup>

The protection afforded by trade secret law does not extend to preventing use of the trade secret by non-licensees who have discovered the secret independently or who have discerned it, through "reverse engineering,"<sup>59</sup> from the proprietor's marketed products.<sup>60</sup> Thus, the benefits of trade secret protection fall far short of the benefits of patent protection.<sup>61</sup> There is, however, protection against use by those who have discovered the secret through unfairness or have used it in breach of confidentiality agreements or fiduciary duties.

The scope of what will be characterized as wrongful disclosure or breach of fiduciary duty may be extremely broad. Yet, the generality of the information appropriated may limit the software proprietor's ability to recover.<sup>62</sup> The dividing line between the general and the secret may not be easy to draw,<sup>63</sup> but many cases have illustrated the type

---

53. *Id.* at 919, 2 Computer L. Serv. Rep. (Callaghan) at 613-14.

54. 510 F.2d 894, 5 Computer L. Serv. Rep. (Callaghan) 3 (10th Cir. 1975).

55. 338 F. Supp. 1229, 3 Computer L. Serv. Rep. (Callaghan) 462 (E.D. Mich. 1971).

56. *Id.* at 1234, 3 Computer L. Serv. Rep. (Callaghan) at 470.

57. Bender, *supra* note 34, at 4.

58. *Id.* at 5.

59. "Reverse engineering" is the process by which a product is analyzed and its formula discovered. *Laff v. John O. Butler Co.*, 64 Ill. App. 3d 603, 616, 381 N.E.2d 423, 433 (1978).

60. *Id.*

61. See Bigelow, *Legal Aspects of Proprietary Software*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-1, art. 1 (1968).

62. See generally *Telex Corp. v. IBM*, 510 F.2d 894, 928-29, 5 Computer L. Serv. Rep. (Callaghan) 3, 59-60 (10th Cir. 1975).

63. *Id.*

of conduct that may or may not be characterized as the appropriation of secrets.

In *Automated Systems, Inc. v. Service Bureau Corp.*,<sup>64</sup> the plaintiff sued for wrongful use of trade secrets and business opportunity.<sup>65</sup> Plaintiff had developed a system for inventory control of auto parts using data processing equipment, formed the plaintiff corporation to develop and market the system, and entered into an agreement with the defendant authorizing it to sell the system to auto dealers during a four month "test sell" period.<sup>66</sup> The defendant service bureau assigned one of its employees (a man with wide experience in data processing and systems analysis, but with no knowledge of the auto parts business) to learn the defendant's system for preparation of a sales manual. Defendant undertook in good faith to perform the sales agreement but, meeting with no success, exercised its termination option. Thereafter, the defendant sold to Chevrolet dealers an inventory system similar to that the plaintiff had designed, but utilizing components more acceptable to Chevrolet.

The court found no wrongful use of trade secrets and no breach of fiduciary duty on the part of the defendant. It was held that the defendant's new system, designed by the same employee who had prepared the sales manual for the plaintiff's system, owed its existence to the auto parts know-how the employee had acquired while working with the plaintiff.<sup>67</sup> But the court regarded that know-how as the kind of general information that an employee may take from one job and freely employ in another, in the absence of a contrary agreement with his former employer.<sup>68</sup> Furthermore, in finding no breach of fiduciary duty, the court placed great emphasis on several facts: the sales agreement between the parties had terminated when the defendant's deal with Chevrolet was made; the defendant had undertaken only to market plaintiff's system as it was, without modifications; the defendant's system was substantially different from the plaintiff's; and the plaintiff's system, already installed prior to the defendant's sales agreement in a number of dealerships, was well-known and was composed of elements generally known and in use.<sup>69</sup> Absent the misuse of trade secrets, the defendant was free to engage in the same general business as the plaintiff after the termination of their contract.<sup>70</sup>

In contrast to the situation in *Automated Systems*, when a former employee finds it necessary to remove documents and equipment from the premises of his former employer, the court is likely to find that the

---

64. 401 F.2d 619, 1 Computer L. Serv. Rep. (Callaghan) 581 (10th Cir. 1968).

65. *Id.* at 620, 1 Computer L. Serv. Rep. (Callaghan) at 581-82.

66. *Id.* at 620, 1 Computer L. Serv. Rep. (Callaghan) at 582.

67. *Id.* at 625, 1 Computer L. Serv. Rep. (Callaghan) at 589.

68. *Id.*

69. *Id.* at 623-24, 1 Computer L. Serv. Rep. (Callaghan) at 586-88.

70. *Id.* at 625, 1 Computer L. Serv. Rep. (Callaghan) at 589.

information so taken was not part of the general information the employee acquired on the job.<sup>71</sup> However, an employee need not physically remove documents for the court to find that more than general information has been carried away. An employee who spends a great deal of time working on an item of software may well have committed portions of it to memory, and "[a]n employee may well learn by heart figures, plans, charts, formulae and so on; the fact that he is able to do so should not mean that he should be able to claim the information as his own knowledge."<sup>72</sup> In *A.H. Emery Co. v. Marcon Products Co.*,<sup>73</sup> in which the plaintiff's former employee reproduced blueprints of a hydraulic load cell from memory, the court found, "[I]t is as much a breach of confidence for an employee to reproduce his employer's drawing from memory as to copy them directly."<sup>74</sup> Similarly, in *Sperry Rand Corp. v. Rothlein*,<sup>75</sup> in which the defendant had memorized and then copied a trade secret technique for producing silicon alloy junction transistors, the court remarked that it is irrelevant whether a copy "came out in a defendant's hand or in his head. His duty of fidelity to his employer remains the same."<sup>76</sup>

Courts will not hold a defendant liable for misappropriation of trade secrets, breach of a confidential relationship or unfair competition merely because he entered into competition with his former employer. In *Computer Sciences Corp. v. Ferguson*,<sup>77</sup> for example, a California court found that a defendant was free to solicit customers of his former employer because "such sales were not made because of the employee's personal acquaintance with the customers and knowledge of the peculiar likes, dislikes and fancies" but, rather, on the employee's ability to improve the quality of products offered by competitors.<sup>78</sup> The employee had the right to announce to customers, before his resignation, that he was going to engage in business for himself and to later use any information he had acquired during his employment, which did not entail trade secrets.<sup>79</sup> Neither these actions nor the use

71. See, e.g., *Analogic Corp. v. Data Translation, Inc.*, 371 Mass. 643, 646-47, 358 N.E.2d 804, 806-07, 6 Computer L. Serv. Rep. (Callaghan) 345, 347-48 (1976).

72. A. TURNER, *THE LAW OF TRADE SECRETS* 169 (1962), quoted in Bender, *supra* note 34, at 10.

73. 268 F. Supp. 289 (S.D.N.Y. 1967), *aff'd*, 389 F.2d 11 (2d Cir. 1968).

74. *Id.* at 300.

75. 241 F. Supp. 549 (D. Conn. 1964).

76. *Id.* at 563.

77. 1 Computer L. Serv. Rep. (Callaghan) 813 (Super. Ct. Los Angeles County Cal. 1967), *aff'd*, 74 Cal. Rptr. 86, 1 Computer L. Serv. Rep. (Callaghan) 823 (Ct. App. 1968).

78. *Id.* at 815.

79. *Id.* Similarly, in *Reed, Roberts Associates, Inc. v. Strauman*, the New York Court of Appeals found that specialized knowledge gained in the computer field, not involving trade secrets, could be used in competition with a former employer from whom such knowledge was obtained; to hold otherwise would render specialists "virtual hostages of their employers." 40 N.Y.2d 303, 309, 353 N.E.2d 590, 594, 386 N.Y.S.2d 677, 680, 7 Computer L. Serv. Rep. (Callaghan) 727, 727 (1976).

of his former employer's customer list constituted a breach of duty.<sup>80</sup>

Of course, a manufacturer may readily prove breach of duty or wrongful use of information if he can show that his employees or customers agreed to keep such information confidential and not to use it to compete. Some writers believe that written contractual commitments not to disclose are the best form of protection available to the software producer.<sup>81</sup> Non-disclosure clauses in leases of software and in employment contracts are increasingly common and may assure producers the right to injunctive relief or monetary damages when breached.

Such clauses, as all contractual provisions, must be carefully drafted so as to render them enforceable, imposing obligations and limiting employee and customer use to the extent desired. The absence of certain terms from a contract may be taken as intentional, and the employee or customer may be free to disclose information or compete in a way the manufacturer intended to prohibit. Restrictive covenants by which an employee agrees not to compete may be unenforceable if the applicable time and geographical area are not sufficiently limited.<sup>82</sup> Moreover, the mere act of entering into an employment relationship with the competitor of a former employer does not, in itself, constitute violation of a covenant not to compete. Restrictions on such new employment will probably not be upheld unless a plaintiff can show that the former employee is working in an area of data processing indistinct from that practiced by the plaintiff and in such a way as to constitute unfair competition.<sup>83</sup>

The difficulty that may arise in contractually limiting the terms of a license granted to a customer is demonstrated by *Systems Development Corp. v. United States*.<sup>84</sup> In that case, the National Library of Medicine obtained a license to use the plaintiff's computerized health information retrieval system<sup>85</sup> and allowed others, including representatives of private pharmaceutical houses, to have access to the computerized data, *i.e.*, to be put on line. The agreement between the parties contained the following language: "The National Library of Medicine

---

80. 1 Computer L. Serv. Rep. (Callaghan) 813, 815 (Super. Ct. Los Angeles County Cal. 1967), *aff'd*, 74 Cal. Rptr. 86, 1 Computer L. Serv. Rep. (Callaghan) 823 (Ct. App. 1968). Use of a former employer's customer list for purposes of competition will not be held actionable when, because of the modicum of care taken in protecting it and limited money and time expended in compiling it, the list does not qualify as a trade secret. *Republic Syss. & Programming, Inc. v. Computer Assistance, Inc.*, 322 F. Supp. 619, 628 (D. Conn. 1970).

81. Bigelow, *Legal Aspects of Proprietary Software*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-1, art. 1, at 8 (1972).

82. 7 COMPUTER L. & TAX. REP., June 1981, at 1 (citing *Applied Data Processing v. Petrillo*, No. 184323 (New Haven Super. Ct. Conn. 1980)).

83. *Modern Controls, Inc. v. Andreadhris*, 578 F.2d 1264, 1270 (8th Cir. 1978); *Electronic Data Syss. Corp. v. Kinder*, 497 F.2d 222, 224, 6 Computer L. Serv. Rep. (Callaghan) 729, 730 (5th Cir. 1974).

84. 531 F.2d 529, 6 Computer L. Serv. Rep. (Callaghan) 193 (Ct. Cl. 1976).

85. *Id.* at 529-30, 6 Computer L. Serv. Rep. (Callaghan) at 193.

agrees not to utilize licensed material in the performance of computer service bureau operations nor performance of any services for third parties except within its mission as established by law or regulations."<sup>86</sup> The plaintiff alleged that the licensee had breached its commitment not to operate as a service bureau and had taken away customers who would otherwise have dealt directly with the plaintiff. Holding that the contract language was ambiguous,<sup>87</sup> the court found that services to pharmaceutical houses were within the library's "mission," falling within the contractual exception.<sup>88</sup> Accordingly, software licensors must make their intentions clear if they are to successfully enjoin disclosure of their information beyond the bounds they intended to license.<sup>89</sup>

Contractual pitfalls notwithstanding, computer software producers may successfully maintain suits for trade secret misappropriation and breach of confidence, recovering both injunctive relief and monetary damages against former employees, customers and competitors. A number of cases illustrate the evidence required and the appropriate measure of damages and form of injunctive relief.

In *Analogic Corp. v. Data Translation, Inc.*,<sup>90</sup> the defendants had worked for the plaintiff while it was developing a high speed data acquisition module.<sup>91</sup> The evidence presented at trial established that the defendants had removed drawings and a sample of the module from the plaintiff's premises. Additionally, it was shown that while the plaintiff had invested eighteen months and \$100,000 in developing its module, within a few months after the defendants left the plaintiff's employment, they were able to produce a similar module for only \$2,500. Consequently, the court found that the defendants' success came not merely as a result of the general increase and improvement in skills acquired while working for the plaintiff, but as a result of their unauthorized use of proprietary information.<sup>92</sup> In fashioning injunctive relief, the court considered the time, according to expert testimony,

---

86. *Id.* at 530, 6 Computer L. Serv. Rep. (Callaghan) at 194.

87. *Id.*

88. *Id.* at 531, 6 Computer L. Serv. Rep. (Callaghan) at 196.

89. Nevertheless, despite a contractual provision to the contrary, the defendant service bureau in *Smithsonian Inst. v. Datatron*, 3 Computer L. Serv. Rep. (Callaghan) 393 (E.D.N.Y. 1971), was unable to retain copies of Smithsonian's computerized mailing list after the termination of the bureau's relationship with Smithsonian. *Id.* at 397. The court reasoned that the subscription list was essential to preserve the Smithsonian Magazine's good will. *Id.* at 396. The court further observed that, in procuring the information in the data file, the defendant had acted solely as the plaintiff's agent and that it had procured most of the information solely as a result of the efforts and expenditures of the plaintiff. *Id.* It was held that the defendant would not be injured by the injunction issued. *Id.* at 397.

90. 371 Mass. 643, 358 N.E.2d 804, 6 Computer L. Serv. Rep. (Callaghan) 345 (1976).

91. *Id.* at 645, 358 N.E.2d at 806, 6 Computer L. Serv. Rep. (Callaghan) at 346.

92. *Id.* at 646, 358 N.E.2d at 806, 6 Computer L. Serv. Rep. (Callaghan) at 347. Additionally, the court believed that the defendants' actions, contrary to statements they had made when they resigned that they were not taking with them any docu-

that would have been required for the defendants to have reverse engineered the plaintiff's module, without having had access to trade secrets.<sup>93</sup> However, the court declared that the time required for reverse engineering should not become an inflexible standard for determining the reasonable length of an injunction not to compete.<sup>94</sup> Since the defendants had been spared the costs of independent invention, the court directed that on remand it would be appropriate for the defendants to be ordered to pay the plaintiff a sum representative of the cost of such independent invention and duplication.<sup>95</sup>

In *Sperry Rand Corp. v. Pentronix, Inc.*,<sup>96</sup> the defendant-employees had agreed in writing not to disclose or use confidential information acquired during their employment with Sperry.<sup>97</sup> Nevertheless, in response to an attractive offer by Pentronix, a year-old corporation with no experience or personnel engaged in the manufacture of magnetic memory cores, the defendants left Sperry, taking with them not only intimate knowledge of Sperry's manufacturing process, but also documents and equipment, which had been clearly designated "Company Confidential."<sup>98</sup> In contrast to the eight years of research and development before Sperry could first market its magnetic memory core, Pentronix was able to enter the market within five months after hiring Sperry's employees.<sup>99</sup> The composition of the Pentronix core was identical in composition to the Sperry model.<sup>100</sup> Moreover, before Pentronix had even produced any cores, it had announced its performance data and test characteristics.<sup>101</sup> Based on this evidence, the court held that Sperry was entitled to injunctive relief, an accounting and damages for profits lost as a result of the defendants' unfair competition and breach of contract.<sup>102</sup>

*Telex Corp. v. IBM*<sup>103</sup> provides a further example of trade secret misappropriation accomplished by luring away a competitor's employees. In that case, Telex was able to enter the market for plug compatible peripheral devices and to displace IBM products, far sooner than it could have done by reverse engineering, through its hiring of key IBM employees and inducing them to reveal IBM trade secrets.<sup>104</sup> The damages awarded to IBM included: the loss IBM sustained for rents of its

---

ments or materials belonging to Analogic, further established their liability. *Id.* at 645, 358 N.E.2d at 806, 6 Computer L. Serv. Rep. (Callaghan) at 346.

93. *Id.* at 647-48, 358 N.E.2d at 807, 6 Computer L. Serv. Rep. (Callaghan) at 348.

94. *Id.* at 648, 358 N.E.2d at 808, 6 Computer L. Serv. Rep. (Callaghan) at 349.

95. *Id.* at 649, 358 N.E.2d at 808, 6 Computer L. Serv. Rep. (Callaghan) at 350.

96. 311 F. Supp. 910, 2 Computer L. Serv. Rep. (Callaghan) 600 (E.D. Pa. 1970).

97. *Id.* at 912, 2 Computer L. Serv. Rep. (Callaghan) at 603.

98. *Id.* at 918, 2 Computer L. Serv. Rep. (Callaghan) at 613.

99. *Id.* at 912, 2 Computer L. Serv. Rep. (Callaghan) at 602.

100. *Id.* at 920, 2 Computer L. Serv. Rep. (Callaghan) at 615-16.

101. *Id.* at 919, 2 Computer L. Serv. Rep. (Callaghan) at 614.

102. *Id.* at 923-24, 2 Computer L. Serv. Rep. (Callaghan) at 620-21.

103. 510 F.2d 894, 5 Computer L. Serv. Rep. (Callaghan) 3 (10th Cir. 1975).

104. *Id.* at 929, 5 Computer L. Serv. Rep. (Callaghan) at 59.



higher-priced device (a loss calculated according to the average monthly rentals IBM would have enjoyed during its exclusive presence in the field while Telex was still engaged in reverse engineering); the approximate amount that IBM had already spent on development of its device at the time its employees were lured away; and the money Telex saved on another of its projects by employing IBM secrets.<sup>105</sup> The court refused to award IBM what had been alleged as increased security costs — for guards' salaries, cameras, locks, etc.<sup>106</sup> It was held that the causal relationship between those security costs and the defendants' misconduct was too speculative because "Telex was not climbing fences or breaking down doors in its appropriation of IBM's trade secrets."<sup>107</sup>

In addition to successful trade secret misappropriation suits against former employees and their new associates, successful actions have been brought based on misappropriation by customers. For example, in *Data General Corp. v. Digital Computer Controls, Inc.*,<sup>108</sup> although computer maintenance diagrams bore proprietary notices restricting use to maintenance purposes only, the defendant had used them to build and market its own minicomputer functionally equivalent to that manufactured by the plaintiff.<sup>109</sup> In the absence of a showing that the defendant had been able to reverse engineer a substantially identical device, it was permanently enjoined from using even its own designs to build and market one, and the case was referred to the jury for an assessment of damages.<sup>110</sup>

*Com-Share, Inc. v. Computer Complex, Inc.*<sup>111</sup> is an example of a successful suit for breach of confidence and trade secret disclosure against a former joint venturer. In that case, the parties had both been engaged in the business of developing and marketing software and offering use of computer systems on a time sharing basis.<sup>112</sup> Operating in different areas of the country, they had not been direct competitors.<sup>113</sup> They had entered into a technical exchange agreement to share new software developments and enhancements, agreeing not to lease, sell, or divulge to third parties the information so acquired without the other's written consent.<sup>114</sup> Upon termination of the agreement, the defendant initiated arrangements to sell its assets and good will to Tymshare, Inc. Tymshare was a large and profitable competitor of the plaintiff-corporation, which had sustained operating losses since its founding. Plaintiff brought suit to enjoin the defendant from further

---

105. *Id.* at 931-32, 5 Computer L. Serv. Rep. (Callaghan) at 63-65.

106. *Id.* at 933, 5 Computer L. Serv. Rep. (Callaghan) at 65.

107. *Id.* at 933, 5 Computer L. Serv. Rep. (Callaghan) at 66.

108. 357 A.2d 105, 5 Computer L. Serv. Rep. (Callaghan) 1073 (Del. Ch. 1975).

109. *Id.* at 107, 5 Computer L. Serv. Rep. (Callaghan) at 1075.

110. *Id.* at 114, 5 Computer L. Serv. Rep. (Callaghan) at 1086-88.

111. 338 F. Supp. 1229, 3 Computer L. Serv. Rep. (Callaghan) 462 (E.D. Mich. 1971).

112. *Id.* at 1231, 3 Computer L. Serv. Rep. (Callaghan) at 464.

113. *Id.* at 1237, 3 Computer L. Serv. Rep. (Callaghan) at 474.

114. *Id.* at 1232, 3 Computer L. Serv. Rep. (Callaghan) at 467.

divulging software developments, which the plaintiff had produced at a cost of two million dollars and had only disclosed under the limitations of the technical exchange agreement. The injunction was granted, with the court finding a confidential relationship between the original parties to the agreement and characterizing the plaintiff's software developments as unique property constituting trade secrets and supplied in confidence.<sup>115</sup>

A similar case, one that presented the court with an opportunity to discuss the propriety of various measures of damages, is *University Computing Co. v. Lykes-Youngstown Corp.*<sup>116</sup> In that case, the parties were negotiating the formation of a partnership to provide computer services.<sup>117</sup> The plaintiff had already developed and issued a restricted license to a department store for use of AIMES III, its automated inventory management evaluation system. It was this system the contemplated partnership was to market. Negotiations ultimately broke down, and the defendant formed his own subsidiary to provide the contemplated services. By persuading an employee of the licensee-department store to turn over the tapes and documents constituting the AIMES system, the defendant was able to copy them and make the system the object of the newly formed subsidiary's sales campaign. The plaintiff successfully sued for misappropriation of trade secrets.<sup>118</sup>

In considering the measure of damages, the court in *University Computing* cited the need for a flexible approach, one looking to the commercial setting of the injury, the probable consequences of the misappropriation, and the extent of use to which the defendant put the trade secret after misappropriation.<sup>119</sup> The court discussed a number of methods for assessing damages, rejecting several before selecting the one it found appropriate. In some cases, the court noted, the loss suffered by the plaintiff would be a useful measure of damages, *e.g.*, when a defendant has published and thereby destroyed a trade secret.<sup>120</sup> In the instant case, however, that had not occurred. Another measure would be the defendant's actual profits from his misappropriation.<sup>121</sup> But the subject defendant had been unsuccessful in marketing the purloined system and, therefore, had received no profits. The plaintiff

---

115. *Id.* at 1239, 3 Computer L. Serv. Rep. (Callaghan) at 478.

116. 504 F.2d 518, 5 Computer L. Serv. Rep. (Callaghan) 1248 (5th Cir. 1974).

117. *Id.* at 526-27, 5 Computer L. Serv. Rep. (Callaghan) at 1250-51.

118. *Id.* at 535, 5 Computer L. Serv. Rep. (Callaghan) at 1259.

119. *Id.* at 538, 5 Computer L. Serv. Rep. (Callaghan) at 1265.

120. *Id.* at 535, 5 Computer L. Serv. Rep. (Callaghan) at 1259-60.

121. *Id.* at 536, 5 Computer L. Serv. Rep. (Callaghan) at 1260-61. The court indicated that it might have awarded as damages what the defendant would have realized as profits had he been successful; this measure would justly allocate to the defendant the risk of his failure in marketing and would remove this risk from the injured plaintiff. *Id.* The court stated that "lack of actual profits does not insulate the defendants from being obligated to pay for what they have wrongfully obtained in the mistaken belief their theft would benefit them." *Id.* at 536, 5 Computer L. Serv. Rep. (Callaghan) at 1261.

could also have been awarded its cost in developing the stolen system; however, in the context of the plaintiff's commercial operations such costs would have been too difficult to ascertain.<sup>122</sup> The court finally adopted, as the appropriate measure of damages, the reasonable cost of a license to assemble and market the plaintiff's system.<sup>123</sup>

Factors to be considered in the cost of a compulsory license include prices paid by past or current licensees, the plaintiff's development costs, the importance of the secret in the plaintiff's business, the nature and extent of the use to which the secret was put by the defendant, foreseeable or resultant changes in the parties' competitive postures, and any unique factors that might exist, such as the ready availability of alternative processes.<sup>124</sup> Upon consideration of these factors and the testimony of an expert in pricing software systems for marketing, the court in *University Computing* set the value of rights to use of the AIMES system — which the defendant was compelled to purchase — at \$220,000.<sup>125</sup> The plaintiff was not required to prove any lost profits; he only needed to show misappropriation and evidence of the value of the secrets taken.<sup>126</sup>

The wide latitude available in fashioning a remedy for the wronged trade secret proprietor is also illustrated in *International Data Corp. v. Informat, Inc.*<sup>127</sup> In that case, the defendants, who had been charged with invading the plaintiff's computerized data bank, were enjoined from retaining, selling, disclosing, copying or using the information they had obtained (a list of computer users) and were ordered to pay a judgment equalling any payment or benefits they had received by using this information.<sup>128</sup> The accounting, upon which this judgment was based, was required to include, *inter alia*, the most currently known name, address and phone number of every person or firm to whom data had been disclosed and an exact description of every copy made by the defendants.<sup>129</sup>

Despite successful suits such as those previously discussed, the common law protection afforded software manufacturers is not always sufficient. The burden of proof imposed on a plaintiff and the flexibility of the courts vary from jurisdiction to jurisdiction. A plaintiff may find it difficult, if not impossible, to sue the misappropriator who does his deed in another jurisdiction.<sup>130</sup> Furthermore, trade secret mis-

---

122. *Id.* at 538, 5 Computer L. Serv. Rep. (Callaghan) at 1264.

123. *Id.* at 538-39, 5 Computer L. Serv. Rep. (Callaghan) at 1266. In arriving at this measure of damages, the court noted that "the primary concern in most cases is to measure the value to the defendant of what he actually obtained from the plaintiff." *Id.* at 539, 5 Computer L. Serv. Rep. (Callaghan) at 1266.

124. *Id.*

125. *Id.* at 544, 5 Computer L. Serv. Rep. (Callaghan) at 1273.

126. *Id.* at 543-46, 5 Computer L. Serv. Rep. (Callaghan) at 1272-77.

127. 3 Computer L. Serv. Rep. (Callaghan) 1163 (C.D. Cal. 1971).

128. *Id.* at 1164-65.

129. *Id.*

130. Because it is unfair competition rather than mere theft that the trade secret doc-

appropriation is not always easy to detect. It will not always be the product of a newly organized corporation that is found to be similar to that of a potential plaintiff, and it will be more difficult to prove that an established concern did not simply turn out a product through independent effort. Moreover, competitors and customers cannot always be trusted to report the overtures of those seeking to market stolen secrets. It is, therefore, not surprising that software manufacturers are casting about for new methods of protection, finding encouragement in the broad benefits and statutory damages available under federal proprietary protection laws.

#### IV. PROPRIETARY PROTECTION UNDER FEDERAL LAW

##### A. Trademark Registration

In an effort to render their products readily identifiable and distinguishable from those of their competitors, manufacturers of computer software have begun to seek the protection of the federal trademark laws.<sup>131</sup> Although some of their efforts have met with definitional impediments, an increasing number of software manufacturers are achieving success in securing trademark registration.

The general applicability of the trademark laws to computer software depends first upon whether the software constitutes "goods in commerce," the statutory description of protectable subject matter.<sup>132</sup> Some software suppliers have already confronted this clause and found it an insurmountable barrier. For example, in *In re Shareholders Data Corp.*,<sup>133</sup> the United States Court of Customs and Patent Appeals considered computer reports on the valuations of subscribers' securities portfolios to be conduits for rendering a service.<sup>134</sup> As such, they were held not to qualify for trademark protection as "goods in trade."<sup>135</sup> Similarly, the Patent Office Trademark Trial and Appeal Board denied registration to the petitioner in *In re Compute-Her-Look, Inc.*,<sup>136</sup> holding that computerized beauty analysis printouts were part of a service, rather than goods solicited in the marketplace for their intrinsic

---

trine is designed to prevent, the law of the jurisdiction where the defendant used the stolen secret controls. *Data Gen. Corp. v. Digital Computer Controls, Inc.*, 357 A.2d 105, 113, 5 Computer L. Serv. Rep. (Callaghan) 1073, 1085 (Del. Ch. 1975).

131. 15 U.S.C. §§ 1051-1127 (1976 & Supp. IV 1980).

132. *Id.* §§ 1052(f), 1127 (1976). In *In re Shareholders Data Corp.*, 495 F.2d 1360, 5 Computer L. Serv. Rep. (Callaghan) 1123 (C.C.P.A. 1974), the United States Court of Customs and Patent Appeals used the phrase "goods in trade." *Id.* at 1361, 5 Computer L. Serv. Rep. (Callaghan) at 1123.

133. 495 F.2d 1360, 5 Computer L. Serv. Rep. (Callaghan) 1123 (C.C.P.A. 1974).

134. *Id.* at 1361, 5 Computer L. Serv. Rep. (Callaghan) at 1123.

135. See note 132 *supra*.

136. 176 U.S.P.Q. (BNA) 445, 5 Computer L. Serv. Rep. (Callaghan) 891 (Pat. Off. Trademark Trial & App. Bd. 1972).

value.<sup>137</sup>

In other instances, however, software manufacturers have successfully secured trademark registration.<sup>138</sup> For example, Data Packaging Corporation was able to register as a trademark the narrow, colored band it mounts on its computer tape reels.<sup>139</sup> Although Data Packaging may have problems in protecting any special techniques it uses, customers will be able to look for its trademark and choose Data Packaging tapes over the products of its competitors, once it has established its reputation for quality.

Similar benefits have been experienced by Calvin Mooers, a software producer who has registered programming languages he has developed.<sup>140</sup> The mark Mooers uses is TRAC, identifying his languages, standards and computer services.<sup>141</sup> The trademark registration prevents other manufacturers from identifying their language by the same name;<sup>142</sup> therefore, they cannot take advantage of the reputation for standardization achieved through the labor of the TRAC manufacturers. While other programmers may appropriate and modify the TRAC languages, users will probably prefer the standardization and compatibility indicated by the name TRAC when they make subsequent software transactions.

Although trademark registration may have some potential for checking unfair competition in the computer software industry, it will not prevent competitors from wrongfully appropriating and using the technology behind the non-copyable trademarks. For statutory help in preventing such parasitism, the software industry has looked instead to the copyright and patent laws.

### B. Copyright Protection

Because a copyright normally affords the holder with the exclusive right to reproduce, adapt, publish, perform and display his work,<sup>143</sup> it is

---

137. *Id.* at 446-47, 5 Computer L. Serv. Rep. (Callaghan) at 893.

138. The field of available trademarks may be wide open to software manufacturers. Since computer software does not compete with other everyday goods for the ordinary consumer's attention, it may be marked by names or symbols which would be rejected (as so similar to other trademarks as to be likely to cause consumer confusion) if associated with those goods. See note 142 *infra*.

139. *In re Data Packaging Corp.*, 453 F.2d 1300, 172 U.S.P.Q. (BNA) 396, 4 Computer L. Serv. Rep. (Callaghan) 104 (C.C.P.A. 1972).

140. See Mooers, *Identification of Programming Languages*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-5, art. 1, at 5 (1978).

141. *Id.*

142. 15 U.S.C. § 1052(d) (1976). Subsection (d) prohibits the registration of a trademark that resembles one that is already registered with the Patent and Trademark Office if the Commissioner of Patents and Trademarks determines that confusion, mistake, or deceit is likely to result from any such resemblance. *Id.* Additionally, any person who commercially uses, reproduces, copies, or colorably imitates a registered trademark so as to deceive or cause confusion or mistake can be held liable in a civil action for infringement. *Id.* § 1114.

143. 17 U.S.C. app. § 106 (1976).

understandable that software manufacturers have eagerly sought this form of protection for their products. The first deposit of a computer program for copyright registration was made on November 30, 1961, but it was not until 1964 that the Register of Copyrights decided computer programs could be accepted for registration.<sup>144</sup> In a circular published that year, the Register stated that the applicability of the federal copyright laws to computer programs would be weighed "in favor of registration, wherever possible."<sup>145</sup> Nevertheless, it was recognized that the copyrightability of computer programs involved two "doubtful questions": whether a computer program was the "writing of an author"<sup>146</sup> and whether a reproduction of that program, in the form actually used to operate a computer, was a copy that could be accepted for copyright registration.<sup>147</sup>

The 1976 Copyright Act<sup>148</sup> apparently answered both of these questions in the affirmative.<sup>149</sup> Additionally, the 1980 revision of section 117 of the Act,<sup>150</sup> precipitated by the recommendations of the National Commission on New Technological Uses of Copyrighted Works,<sup>151</sup> provided some clarification of the extent to which a copy-

---

144. See Note, *Protection of Computer Software — A Hard Problem*, 26 DRAKE L. REV. 180, 192 (1976-1977).

145. Copyright Office Circular 31D (Jan. 1965), reprinted in 6 Computer L. Serv. Rep. (Callaghan) 1167 (1978).

146. *Id.* Whether a computer program or a data base is the "writing of an author" is more than a mere question of semantics. Rather, this question lies at the very root of copyrightability. The constitutional authority for enactment of a copyright statute and for its application by the agency Congress delegates is article I of the United States Constitution, by which Congress is given the power "[t]o 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." U.S. CONST. art. I, § 8, cl. 8. It is patent protection which is extended to inventors and their discoveries; copyright protection extends to authors and their writings. See Note, *Protection of Computer Software — A Hard Problem*, 26 DRAKE L. REV. 180, 184-96 (1976-1977). Thus, programs and data bases must qualify as "writings of an author" before Congress may constitutionally grant them copyright protection.

147. Copyright Office Circular 31D (Jan. 1965), reprinted in 6 Computer L. Serv. Rep. (Callaghan) 1167 (1978). Under the Copyright Act of 1909, ch. 320, §§ 1-64, 35 Stat. 1075-88 (current version at 17 U.S.C. app. §§ 101-118 (1976 & Supp. IV 1980)), to qualify his "writing" for copyright protection an "author" had to deposit two copies of a published work with the Register of Copyrights. *Id.* § 12, 35 Stat. at 1078. The computer software industry had great difficulty complying with this statutory requirement since it was not clear that programs in machine readable form were "published" when disseminated or that, when deposited, they qualified as "copies."

148. 17 U.S.C. app. §§ 101-117 (1976 & Supp. IV 1980). The 1976 Copyright Act is the first major revision of federal copyright law since 1909.

149. *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F. Supp. 171, 173 (N.D. Cal. 1981) (citing 17 U.S.C. §§ app. 101, 102 (1976)); see text accompanying notes 156-78 *infra*.

150. 17 U.S.C. § 117 (Supp. IV 1980).

151. NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT (1978) [hereinafter cited as CONTU].

righted program could be rightfully used and adapted by the owner of a copy of that program. The Act fails, however, to set precise limits on such use and does not specifically address the fair use that others may make of copyrighted computer software. Moreover, unique problems exist in the software field in detecting and, thereby, proving infringement.

### 1. Copyrightability of Computer Software

In copyright law, a fundamental distinction exists between the expression of ideas and the employment of those ideas, the latter of which is not a writing of an author that can properly be protected by a copyright. For example, in the landmark case of *Baker v. Selden*,<sup>152</sup> the United States Supreme Court ruled that the plaintiff-author of a copyrighted book was not protected from use by others of his bookkeeping system, but only from their reproducing his expression of those bookkeeping ideas.<sup>153</sup> Similarly, the United States Court of Appeals for the Fifth Circuit in *Imperial Homes Corp. v. Lamont*<sup>154</sup> indicated that while a copyright can prohibit anyone but the architect from copying a blueprint, it does not prevent others from constructing the dwelling pictured.<sup>155</sup>

Section 102 of the 1976 Copyright Act, consistent with the above cases, provides that copyright protection does not extend to "any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied" in the author's work.<sup>156</sup> Rather, the proper subject matter of copyright is "in original *works of authorship* fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."<sup>157</sup> Among works of authorship are "literary works."<sup>158</sup> Congress has indicated that this designation

does not connote any criterion of literary merit or qualitative value: it includes catalogs, directories, and similar factual, reference, or instructional works and compilations of data. It also includes computer data bases, and computer programs to the extent that they incorporate authorship in the programmer's expression of original ideas, as distinguished from the

---

152. 101 U.S. 99 (1879).

153. *Id.* at 104-07.

154. 458 F.2d 895 (5th Cir. 1972).

155. *Id.* at 899.

156. 17 U.S.C. § 102(b) (Supp. IV 1980).

157. *Id.* § 102(a) (emphasis added). Thus, there is room for the copyright protection to expand along with society's imagination.

158. *Id.* § 102(a)(1).

ideas themselves.<sup>159</sup>

Although, like other compilations, data bases may easily be viewed as protectable literary works, it may be difficult to draw the line between the copyrightable elements of style and expression in a computer program and the process which underlies it.<sup>160</sup>

The 1976 Act goes even further in clarifying the fact that reproductions of computer programs can constitute statutorily prohibited "copies." Previously, it was questionable whether unauthorized placement of a copyrighted work into a computer, *e.g.*, in the form of IBM cards or magnetic tapes, amounted to the preparation of a copy in violation of the rights of the copyright owner.<sup>161</sup> However, prior case law, holding that something "is not susceptible of being copied until it has been put in a form which others can see and read,"<sup>162</sup> has been entirely abandoned by section 101 of the new Act:

"Copies" are material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or *with the aid of a machine or device*. The term "copies" includes the material object, other than a phonorecord, in which the work is first fixed.<sup>163</sup>

A work is "fixed" if it is "sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration."<sup>164</sup>

Two recent cases address the issue of whether a reproduction of a copyrighted computer program in its object phase violates the 1976 Act: *Data Cash Systems, Inc. v. JS&A Group, Inc.*<sup>165</sup> and *Tandy Corp. v. Personal Micro Computers, Inc.*<sup>166</sup> The courts in these cases arrived at contradictory conclusions as to the Act's applicability to read only memory (ROM) chips.

159. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 52, *reprinted in* [1976] U.S. CODE CONG. & AD. NEWS 5659, 5667.

160. Copyright Office Circular 31D (Jan. 1965), *reprinted in* 6 Computer L. Serv. Rep. (Callaghan) 1167 (1978).

161. *See Carey, Copyright Registration and Computer Programs*, 11 BULL. COPYRIGHT SOC'Y 362, 364-65 (1964).

162. *White-Smith Music Publishing Co. v. Apollo Co.*, 209 U.S. 1, 17 (1908). In that case, the plaintiff, a publisher of sheet music, could not recover for infringement of its copyright because the defendant's perforated music rolls, for use in player pianos, were not intelligible to human beings and, therefore, did not constitute copies. *Id.* at 18. *See also* Copyright Office Circular 31D (Jan. 1965), *reprinted in* 6 Computer L. Serv. Rep. (Callaghan) 1167 (1978).

163. 17 U.S.C. app. § 101 (1976 & Supp. IV 1980) (emphasis added).

164. *Id.*

165. 480 F. Supp. 1063, 7 Computer L. Serv. Rep. (Callaghan) 1004 (N.D. Ill. 1979), *aff'd on other grounds*, 628 F.2d 1038, 7 Computer L. Serv. Rep. (Callaghan) 1438 (7th Cir. 1980).

166. 524 F. Supp. 171 (N.D. Cal. 1981).



Although the United States District Court for the Northern District of Illinois held that the 1909 Act, rather than the 1976 Act, applied in *Data Cash*,<sup>167</sup> the court believed that the definition of "copy" under the 1976 Act applied to "computer programs in their flow chart, source and assembly phases but not in their object phase, *i.e.*, the ROM."<sup>168</sup> It was noted that section 101 of the Act defined copies as encompassing works "which may be perceived 'with the aid of a machine or device.'"<sup>169</sup> Because the court concluded that a computer program in its object phase is a mechanical device rather than a protected work, it stated that copies of the ROM would not fall within that definition.<sup>170</sup>

The United States Court of Appeals for the Seventh Circuit noted on appeal that during the trial neither party had argued the point that an object program was not a copy and, before the present court, neither party was defending it.<sup>171</sup> Therefore, the court did not consider the issue further and affirmed the lower court's decision that there was no infringement on other grounds.<sup>172</sup>

In *Tandy Corp. v. Personal Micro Computers, Inc.*,<sup>173</sup> the United States District Court for the Northern District of California expressly disagreed with the dicta in *Data Cash*.<sup>174</sup> The defendant's duplication of Tandy's copyrighted programs onto silicon chips constituted infringement, in the court's opinion, because the ROM chips fell within the 1976 Act's definition of copies.<sup>175</sup> In concluding that they were

---

167. 480 F. Supp. 1063, 1066-67, 7 Computer L. Serv. Rep. (Callaghan) 1004, 1008-09 (N.D. Ill. 1979), *aff'd on other grounds*, 628 F.2d 1038, 7 Computer L. Serv. Rep. (Callaghan) 1438 (7th Cir. 1980). The court believed section 117 limited actions against infringers of computer copyrights to the law in force prior to the 1976 Act. *Id.* (citing 17 U.S.C. § 117 (1976) (superceded)).

168. *Id.* at 1066 n.4, 7 Computer L. Serv. Rep. (Callaghan) at 1008 n.4. The development of *Data Cash*'s computer program for a computer chess game, *Compuchess*, involved four phases: (1) creation of a flow chart; (2) formulation of a "source program," which involved translating the flow chart into computer program language; (3) translation of the "source program" into machine readable language, called an "assembly program"; and (4) development of an "object program," which involved conversion of the machine language into a device commanding a series of electric impulses. *Id.* at 1065, 7 Computer L. Serv. Rep. (Callaghan) at 1005-06. This "object program," the read only memory (ROM), was then installed in the *Compuchess* computer as part of the circuitry. *Id.* at 1066, 7 Computer L. Serv. Rep. (Callaghan) at 1007.

169. *Id.* at 1066 n.4, 7 Computer L. Serv. Rep. (Callaghan) at 1008 n.4 (citing 17 U.S.C. § 101 (1976)).

170. *Id.*

171. 628 F.2d 1038, 1041, 7 Computer L. Serv. Rep. (Callaghan) 1438, 1441 (7th Cir. 1980).

172. *Id.* at 1040, 7 Computer L. Serv. Rep. (Callaghan) at 1439. The court held that *Data Cash* was precluded from recovering for copyright infringement because of its failure to provide proper copyright notice. *Id.* at 1042, 7 Computer L. Serv. Rep. (Callaghan) at 1443.

173. 524 F. Supp. 171 (N.D. Cal. 1981).

174. *Id.* at 175.

175. *Id.* at 173. "The technology of computers has reached the point where programs

"fixed," so as to fulfill the requirements of section 102(a), the court relied on legislative history:

"Under the bill it makes no difference what the form, manner or medium of fixation may be — whether it is in words, numbers, notes, sounds, pictures or any other graphic or symbolic indicia, whether embodied in a physical object in written, printed, photographic, sculptural, punched, magnetic, or other stable form, and whether it is capable of perception directly or by means of any machine or device 'now known or later developed.'"<sup>176</sup>

Consequently, the court was not persuaded by the Illinois district court's opinion in *Data Cash* that an object program is not a statutorily prohibited copy.<sup>177</sup> The *Tandy* court also held that the definitional sections protect a computer program, as a "work of authorship," and a silicon chip, as a "tangible medium of expression."<sup>178</sup>

## 2. Requirements for Copyright Protection

Just as the 1976 Act's definitional sections make copyright more available, the formal requirements of the Act render such protection more accessible to computer programmers. Unlike the old Act, which required publication with copyright notice and deposit with the Copyright Office of two complete copies,<sup>179</sup> the new law provides that copyright subsists from the first moment a work of authorship is fixed in a tangible medium of expression and that publication with notice is no longer a prerequisite.<sup>180</sup> Consequently, federal copyright law largely pre-empts common law copyright,<sup>181</sup> which protected unpublished

---

can be imprinted directly onto silicon chips. Those chips are then permanently wired into the computer." *Id.*

176. *Id.* (quoting H.R. REP. NO. 1476, 94th Cong., 2d Sess. 52, reprinted in [1976] U.S. CODE CONG. & AD. NEWS 5659, 5665).

177. *Id.* at 175. The *Tandy* court also disagreed with the holding of the district court in *Data Cash* that section 117 of the 1976 Act was intended to limit owners of copyrighted computer works to recovery based on the law existing prior to the new Act. *Id.* at 174-75. See note 167 *supra*. The section was interpreted in *Tandy*, based on the language used and legislative history, to apply only to "the problems surrounding the input into computers of properly obtained copyrighted materials." 524 F. Supp. 171, 174 (N.D. Cal. 1981). The court concluded that Congress was only concerned with "computer uses of copyrighted works." *Id.* (quoting H.R. REP. NO. 1476, 94th Cong., 2d Sess. 116, reprinted in [1976] U.S. CODE CONG. & AD. NEWS 5659, 5731) (emphasis in original). The subsequent revision of section 117, which prescribes the extent of permissible adaptation by the owner of a copy of a computer program, supports the *Tandy* court's interpretation of the earlier version of that section. See 17 U.S.C. § 117 (Supp. IV 1980).

178. 524 F. Supp. 171, 173 (N.D. Cal. 1981) (citing 17 U.S.C. app. §§ 101, 102 (1976)).

179. Act of Mar. 4, 1909, ch. 320, §§ 9, 12, 35 Stat. 1077, 1078 (repealed 1947).

180. 17 U.S.C. § 102(a) (Supp. IV 1980).

181. *Id.* § 301; H.R. REP. NO. 1476, 94th Cong., 2d Sess. 52, 129-33, reprinted in [1976] U.S. CODE CONG. & AD. NEWS 5659, 5745-49.

works from the moment of their creation.<sup>182</sup> Thus, producers of computer software have rights in their original products prior to any registration and those rights endure for the life of the originator plus fifty years.<sup>183</sup>

While registration is not a prerequisite to copyright, it is a prerequisite to an infringement suit.<sup>184</sup> Registration may be obtained by delivering the required deposits to the Copyright Office,<sup>185</sup> along with the Class TX registration form (for nondramatic literary works).<sup>186</sup> Generally, one complete copy of an unpublished work or two copies of a published work must be provided to secure registration.<sup>187</sup> This deposit requirement would present an obstacle to registration of data bases and programs, which are constantly being modified and updated, but for the statutory section allowing the Register of Copyrights to permit, for particular classes, the deposit of identifying material instead of copies.<sup>188</sup> However, identifying portions of computer programs and data bases must be submitted in a form visually perceptible without the aid of a machine or device.<sup>189</sup>

Additionally, the 1976 Act requires:

Whenever a work protected under this title is published in the United States or elsewhere by authority of the copyright owner, a notice of copyright as provided by this section shall be placed on all publicly distributed copies from which the work

---

182. M. NIMMER, COPYRIGHTS § 2.02, at 2-16 (1981).

183. 17 U.S.C. § 302(a) (Supp. IV 1980). Moreover, when a work is made for hire, as is the case with many computer programs, "the copyright endures for a term of seventy-five years from the year of its first publication or a term of one hundred years from the year of its creation, whichever expires first." *Id.* § 302(c).

184. *Id.* § 411(a).

185. *Id.* § 408.

186. 37 C.F.R. § 202.3(b)(i) (1981).

187. 17 U.S.C. app. § 408(b)(1)-(2) (1976 & Supp. IV 1980).

188. *Id.* § 407(c). The exception was enacted to provide "a satisfactory archival record of a work without imposing practical or financial hardship on the depositor." *Id.*

189. 37 C.F.R. § 202.20(c)(2)(vii)(A) (1981). The Copyright Office has specifically prescribed alternative forms of registration for machine readable works. *Id.* § 202.20(c)(2)(vii)(A)-(B). For computer programs in the form of machine readable copies, such as magnetic tapes, discs, or punched cards, the deposit must consist of "one copy of [the] identifying portions of the programs . . . the first and last twenty-five pages or equivalent units of the program . . . together with the page or equivalent unit containing the copyright notice, if any," in a form visually perceptible without the aid of a machine or device (on paper or in microform). *Id.* § 202.20(c)(2)(vii)(B). For data bases, the identifying portions requirement applies in a similar manner, except that in the case of an automated data base comprising separate and distinct data files, fifty complete data records from each file or the entire file, whichever is less, must be submitted in visually perceptible form. *Id.* A typed or printed description statement must accompany such representative portions of an automated data base, including, *inter alia*, the name and content of each separate file within the data base, the origin(s) of the data, a description of the exact contents and manner of display of any machine readable copyright notice employed in the work, the frequency with which it is displayed and a sample of any visually perceptible copyright notice placed on the work or its containers. *Id.*

can be visually perceived, either directly or with the aid of a machine or device.<sup>190</sup>

To fulfill this requirement, copyright indicia,<sup>191</sup> along with the date of publication and the name of the copyright owner, "shall be affixed to the copies in such manner and location as to give reasonable notice of the claim of copyright."<sup>192</sup> The Copyright Office has offered four examples of acceptable methods for affixing notice upon works in machine readable form: (1) a notice embodied on the machine readable copies so that when a visually perceptible printout is made, the notice appears either with or near the title or at the end of the work; (2) a notice displayed at the user's terminal when he signs on; (3) a notice that is continuously displayed on the terminal; or (4) a permanently legible notice reproduced on a label that is securely attached to the copies, or to a box, reel, cartridge, cassette or other container used as the copies' permanent container.<sup>193</sup>

### 3. Use by Others of Copyrighted Computer Software

#### *a. Adaptation and Copying by Rightful Possessors*

When Congress passed the 1976 Copyright Act, section 117 was originally enacted to postpone legislation on accepted computer uses of copyrighted works,<sup>194</sup> pending a report by the National Commission on

190. 17 U.S.C. app. § 401(a) (1976 & Supp. IV 1980).

191. Acceptable copyright marks include the letter "C" in a circle, the word "Copyright," or the abbreviation "Copr." *Id.* § 401(b)(1).

192. *Id.* § 401(b)-(c). Additionally, "[t]he Register of Copyrights shall prescribe by regulation, as examples, specific methods of affixation and positions of the notice on various types of works that will satisfy this requirement, but these specifications shall not be considered exhaustive." *Id.* § 401(c). This section suggests that there is room for the use of novel techniques for affixing copyright notice on data bases.

193. 37 C.F.R. § 201.20(g) (1981).

194. 17 U.S.C. app. § 117 (1976) (current version at 17 U.S.C. § 117 (Supp. IV 1980)). As originally enacted, section 117 provided:

Notwithstanding the provisions of sections 106 through 116 and 118, this title does not afford to the owner of copyright in a work any greater or lesser rights with respect to the use of the work in conjunction with automatic systems capable of storing, processing, retrieving, or transferring information, or in conjunction with any similar device, machine, or process, than those afforded to works under the law, whether title 17 or the common law or statutes of a State, in effect on December 31, 1977, as held applicable and construed by a court in an action brought under this title.

*Id.* Computer uses of copyrighted works was defined as "the use of works 'in conjunction with automated systems capable of storing, processing, retrieving, or transferring information.'" H.R. REP. NO. 1476, 94th Cong., 2d Sess. 116, reprinted in [1976] U.S. CODE CONG. & AD. NEWS 5659, 5731. The House Report notes that "[w]ith respect to the copyrightability of computer programs, the ownership of copyrights in them, the term of protection, and the formal requirements of the remainder of the bill, the new statute would apply." *Id.*

New Technological Uses of Copyrighted Works (CONTU).<sup>195</sup> The Commission was created to provide recommendations regarding the use of such works in conjunction with computer and machine duplication, including data base input and photocopying.<sup>196</sup> In its formal report on July 31, 1978, CONTU recommended that the new law be amended so as to make it explicit that computer programs are copyrightable subject matter<sup>197</sup> and "to ensure that rightful possessors of copies of computer programs . . . [could] use or adapt these copies for their use."<sup>198</sup> Permissible adaptations would include the making of a machine language object program from a source program that a customer had rightfully acquired.<sup>199</sup> Permissible copying would include the placing of the program into the computer's memory.<sup>200</sup> Such adaptation and copying would merely permit the customer to use the program for the purpose for which he acquired it and in conjunction with a computer to which he has access.<sup>201</sup> "Rightful possessors" would also

---

195. See CONTU, *supra* note 151.

196. See H.R. REP. NO. 1476, 94th Cong., 2d Sess. 116, *reprinted in* [1976] U.S. CODE CONG. & AD. NEWS 5659, 5731.

197. CONTU, *supra* note 151, at 1. CONTU premised its support for copyright protection of computer software by pointing to its determination that a copyright had the "smallest negative impact" upon economic factors such as protection of the market, when compared to trade secret or patent protection. *Id.* at 16-18. The Commission found no evidence to support a contention that affording copyright protection to programs facilitated the creation of monopolies by software firms. *Id.* at 23. Noting that the competitive industrial system allows entrepreneurs to easily enter fields already occupied by firms doing business, the Commission stated, "The absence of significant barriers to entering the program-market is striking. There are several hundred independent firms whose stock in trade is computer programs . . . . [No] firm is even remotely close to dominating the programming industry." *Id.* The Commission also found that copyrighting computer programs would have a negligible effect on the retail prices of consumer goods and services. *Id.* at 23-24.

CONTU strenuously argued that no distinction could be made, for purposes of determining eligibility for copyright protection, between programs which produce copyrightable output and those which do not. *Id.* at 21. In contrast, Commissioner Nimmer suggested, in his separate opinion, that copyright law ought to exclude from the scope of its protection all programs employed in such tasks as regulating traffic lights during rush hour or monitoring the vital signs of a patient in intensive care. *Id.* The Commission majority rejected this distinction since "it does not square with copyright practice past and present, which recognizes copyright protection for a work of authorship regardless of the uses to which it may be put." *Id.* The Commission asserted that judgments on the artistic or literary merit of works of authorship, always assiduously avoided by the courts, are inappropriate standards for determining copyrightability. *Id.* at 25.

Assistant Attorney General William F. Baxter, head of the Justice Department's Antitrust Division, apparently agreeing that copyright protection for computer software will not encourage monopolies, recently expressed plans to seek even stronger copyright protection for computer software. See PAT. TRADEMARK & COPYRIGHT J. (BNA) No. 571, at A-4 (March 18, 1982).

198. CONTU, *supra* note 151, at 1.

199. See *id.* at 12-13.

200. See *id.* at 13.

201. *Id.*

be allowed to make archival copies, to be used in case of destruction or damage of the original due to mechanical or electrical failure.<sup>202</sup> These archival copies would have to be destroyed when rightful possession ended or returned along with the original copy to the copyright owner.<sup>203</sup> Under the CONTU recommendations, the right to make needed adaptations would also explicitly include the right, notwithstanding the copyright proprietor's exclusive right to prepare translations, to convert the program from one higher level language to another and to add features to the program that were not present at the time of rightful acquisition.<sup>204</sup> Copyright proprietors not wishing to permit such adaptations would remain free to contractually limit the use of their programs.<sup>205</sup>

CONTU further recommended that section 117 of the new law be repealed so that there would be no question that the placement of copyrighted works into computers is the preparation of a copy and a potential copyright infringement.<sup>206</sup> In 1980, the section was reenacted to permit owners of copies of copyrighted computer programs to make new copies or adaptations provided:

(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or (2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.<sup>207</sup>

*b. Application of the Morrisey Doctrine to Copyrighted Computer Programs*

As previously stated, copyrights are intended to protect the expression of ideas, rather than the ideas themselves.<sup>208</sup> Logically, therefore, if only a very limited number of expressions of an idea are possible, one may not restrict another's use of an idea by obtaining a copyright on the language employed. This restriction has been designated the *Morrisey* doctrine based on the case, *Morrisey v. Proctor & Gamble Co.*<sup>209</sup> In that case, the United States Court of Appeals for the First Circuit held that *Morrisey* had not infringed on *Proctor & Gamble's*

---

202. *Id.* at 12-13.

203. *Id.* at 12.

204. *Id.* at 13.

205. *Id.* at 13-14.

206. *Id.* at 12-13. Section 117 had raised questions as to the ability of software manufacturers to recover for infringement of their copyrighted works. See note 177 *supra*.

207. 17 U.S.C. § 117 (Supp. IV 1980). A computer program is statutorily defined as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." *Id.* § 101.

208. See text accompanying notes 152-55 *supra*.

209. 379 F.2d 675 (1st Cir. 1967).

copyright by copying the latter's boxtop sweepstake rules almost verbatim because the number of ways to express such rules was extremely limited.<sup>210</sup>

The *Morrissey* doctrine remains applicable under the new Copyright Act,<sup>211</sup> indicating that copyright protection for computer programs will not forbid unauthorized use of language previously copyrighted by other programmers when such use is necessary to implement a particular process.<sup>212</sup> Consequently, programmers remain free to recast ideas embodied in copyrighted language into other operable languages.<sup>213</sup> The degree of protection copyright law will afford program proprietors depends, therefore, upon whether computer ideas may be expressed in only a limited number of ways and upon how difficult it would be for others to extract those ideas without copying the proprietor's language. Some experts believe that countless ways exist to produce a program and that programming ideas can easily be restated in another language.<sup>214</sup> Yet others suggest that ideas in copyrighted program language may be difficult to extract without using the

---

210. *Id.* at 678-79. In *Continental Cas. Co. v. Beardsley*, 253 F.2d 702 (2d Cir.), *cert. denied*, 358 U.S. 816 (1958), the United States Court of Appeals for the Second Circuit similarly reasoned:

[T]he use of specific language . . . may be so essential to accomplish a desired result and so integrated with the use of a . . . conception that the proper standard of infringement is one which will protect as far as possible the copyrighted language and yet allow free use of the thought beneath the language.

*Id.* at 706.

211. See 17 U.S.C. § 117 (Supp. IV 1980); CONTU, *supra* note 151, at 20.

212. CONTU, *supra* note 151, at 20. The CONTU report states that "copyrighted language may be copied without infringement when there is but a limited number of ways to express an idea. This rule is the logical extension of the fundamental principle that copyright cannot protect ideas." *Id.* (footnote omitted).

213. The CONTU Software Subcommittee recommended that infringement be found in the case of unauthorized COBOL-FORTRAN translation (the communication of business oriented problems to a computer). See Bigelow, *Copyrighting Programs*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-3, art. 4, at 4 (1978). Yet, there is some question as to whether program copyright proprietors should have exclusive rights to prepare such translations. When human language is involved (e.g., French, English, etc.), it is possible to protect particular expressions of ideas without restricting the free use of the ideas themselves. To move from FORTRAN to COBOL, on the other hand, is essentially the use of ideas, first employed in programs for scientifically applied computers, in programs implementing business use of computers. The translation is more of a science than an art; the mode of expression so changes that nothing of the initial programmer's original expression can be retained. To nevertheless give the original programmer exclusive translation rights is, in effect, to give him a monopoly on new uses of his ideas, which copyright is not intended to protect. See Corasick & Brockway, *Protection of Computer-Based Information*, 40 ALB. L. REV. 113, 126-28 (1975). The authors of that article discuss machine encoding as translation, but their comments are pertinent to the limitations of COBOL-FORTRAN translation.

214. CONTU, *supra* note 151, at 20 n.106. At a CONTU hearing, Dan McCracken, Vice President of the Association for Computing Machinery, was asked how many different ways there were to produce a program, and he replied, "An infinite number in principle, and in practice dozens, hundreds." *Id.*

same or very similar language.<sup>215</sup> A fair assessment of the limitations imposed upon software competitors by copyright protection is perhaps that it may vary according to the complexity of the program copyrighted and the skill of rival programmers.<sup>216</sup>

c. *Use of Data Bases*

The 1976 Copyright Act does not specifically address the scope of protection afforded to data bases and the works contained therein. CONTU noted, however, that section 106 of the new law would prohibit the unauthorized storage of a copyrighted work within a computer memory as part of the data base.<sup>217</sup> Exclusive rights inhere in the proprietor of the copyrighted input.<sup>218</sup> Yet, as section 107 points out, some "fair use" may be made of copyrighted works.<sup>219</sup>

The determination of whether a use is fair depends on the nature of the work. CONTU believed that fair use would rarely apply to the reproduction of copyrighted works in their entirety, unless authorized by the copyright proprietors.<sup>220</sup> Fair use would apply with similar rar-

215. Note, *Protection of Computer Programs: Resurrection of the Standard*, 50 NOTRE DAME LAW. 333, 341 (1974). "To maintain the time saving factor while incorporating the basic premise of the old program into a schematically different yet functionally equivalent new program would be difficult." *Id.*

216. Although free use of the ideas presented in copyrighted expressions may not be inhibited by copyright law, a copyright holder has the exclusive right to perform his work publicly. Some writers have suggested that this right may afford programmers some additional protection. In *Walt Disney Prod. v. Alaska Television Network, Inc.*, 310 F. Supp. 1073 (W.D. Wash. 1969), the United States District Court for the Western District of Washington held that the defendant's video taping of the plaintiff's program and dissemination of it through the defendant's cable system constituted a copyright infringement in violation of the plaintiff's exclusive right of performance. *Id.* at 1075. One commentator has observed:

There is great similarity between capturing a dramatic work on video tape and capturing a literary work (i.e. computer program) on computer magnetic tape. By analogy, if the playing of the video tape constitutes a performance of the dramatic work, the use of a computer magnetic tape constitutes a performance of the literary work.

Prasinos, *Worldwide Protection of Computer Programs by Copyright*, 4 RUTGERS J. COMPUTERS & L. 42, 67 (1974).

217. CONTU, *supra* note 151, at 39.

218. 17 U.S.C. app. § 106 (1976 & Supp. IV 1980).

219. *Id.* § 107.

220. CONTU, *supra* note 151, at 39. Parties could enter into contractual or licensing arrangements so that copyrighted works might be fed into computers, with any limitations remaining a subject for negotiation. A copyright clearinghouse to negotiate group contracts between information users and copyright owners could be developed, to facilitate contracts based on the terms reached between the copyright owners and the clearinghouse. Keplinger, *Input of Copyrighted Works to Computer Systems: The Case for Invisible Copies*, 3 COMPUTER L. SERV. (CALLAGHAN) § 5-3, art. 4, at 15 (1973).

Since "authors" have traditional publication rights as well as the exclusive right to place their works into machine readable form, a new form of original publishing may even emerge. "There is reason to believe that machine-readable data bases will largely replace their hard copy counterparts in providing . . . [in-



ity to the reproduction of data bases by placing them in memory.<sup>221</sup>

That only one copy is being made, or even that the owner of the computer system intends to exact no fee for providing access to the work, would no more insulate the copies from liability for copyright infringement than would similar circumstances insulate a public library which made unauthorized duplications of entire copyrighted works for its basic lending functions.<sup>222</sup>

Nevertheless, unauthorized placement of a complete work into a computer's memory to facilitate scholarly research, *e.g.*, making a concordance to do syntactical analysis or criticism of a work, might not constitute infringement. However, "[t]o prevent abuse of fair use principles, any copy created in a machine memory should be erased after completion of the particular research project for which it was made."<sup>223</sup>

The purpose of so narrowly restricting the copying of works in their entirety is to preserve the potential market for these works. There are, of course, instances in which the principal way in which a work is used is by consultation of its segments. Researchers using abstracts rarely need more than limited portions of the volumes they consult. Therefore, the standards of fair use would need to be more stringent when portions of abstracts have been placed into a computer. On the other hand, the input of insubstantial portions of works most often used in their entirety could conceivably be fair. If the use in question would have been fair without the aid of a machine, the principle should be extended to use of the work in a computer.<sup>224</sup>

It is clear that one who purchases the right to retrieve data upon a search request would infringe a copyright by retrieving the entire data base and marketing a duplicate. At the other extreme, retrieval and use of single items would certainly not constitute copyright infringement.<sup>225</sup> Yet,

[t]he retrieval and reduplication of any substantial portion of a data base, whether or not the individual data are in the public domain, would likely constitute a duplication of the copyrighted element of a data base and would be an infringement. In any event, the issue of how much is enough to constitute a copyright violation would likely entail analysis on a case-by-case basis with considerations of fair use bearing on whether the unauthorized copying of a limited portion of a

---

formation to those] with substantial research needs." Squires, *Copyright and Compilations in the Computer Era: Old Wine in New Bottles*, 24 BULL. COPYRIGHT SOC'Y 18, 46 (1976).

221. CONTU, *supra* note 151, at 39.

222. *Id.* at 40 (footnote omitted).

223. *Id.* at 40 n.166.

224. See Lawlor, *Copyright Aspects of Computer Usage*, 11 BULL. COPYRIGHT SOC'Y 380, 400 (1964).

225. CONTU, *supra* note 151, at 42.

data base would be held noninfringing. Fair use should have very limited force when an unauthorized copy of a data base is made for primarily commercial use.<sup>226</sup>

Courts have been persuaded more readily to find infringement in cases in which there has been evidence of unfair economic advantage or unfair competition. One writer has noted

that the permissible use made of a prior copyrighted compilation by a subsequent compiler is narrower when the subsequent compiler is a competitor of the former. As the use approaches the point of possible competitive disadvantage to the copyrighted works — or at least dilution of its reputation or uniqueness — the courts will be less inclined to condone unverified copying.<sup>227</sup>

Such was the rationale of at least one case viewed as discordant with the general principles of copyright law.<sup>228</sup> In *Leon v. Pacific Telephone & Telegraph Co.*,<sup>229</sup> a defendant's directory of telephone numbers in numerical sequence allegedly infringed the plaintiff's copyright in an alphabetical city directory.<sup>230</sup> Despite the fact that the defendant inverted the names and numbers, the court found for the plaintiff, based on the unfair economic advantage acquired through such practices.<sup>231</sup> Thus, it may be surmised that when substantial portions of data bases have been copied and used to the data base proprietor's economic disadvantage, the courts may be inclined to find infringement.

What would constitute fair use of a data base will probably depend, in part, on whether the data base has been published. Section 101 of the new Copyright Act defines "publication" and suggests that whether a work is published depends upon the extent and nature of its distribution.<sup>232</sup> It is published if it is distributed under no explicit or implicit restrictions and is thus available for further distribution or public display.<sup>233</sup> The fair use doctrine is applied more narrowly to unpublished works "since, although the work is unavailable, this is the result of a deliberate choice on the part of the copyright owner."<sup>234</sup>

A data base proprietor could conceivably avoid publication by making his data base available only to particular users, placing restrictions on disclosure and transfer. He could then more substantially de-

---

226. *Id.*

227. Squires, *Copyright and Compilations in the Computer Era: Old Wine in New Bottles*, 24 BULL. COPYRIGHT SOC'Y 18, 28-29 (1976).

228. *Id.* at 29.

229. 91 F.2d 484 (9th Cir. 1937).

230. *Id.* at 485.

231. *Id.* at 486-87.

232. 17 U.S.C. app. § 101 (1976 & Supp. IV 1980).

233. *Id.*

234. S. REP. NO. 473, 94th Cong., 1st Sess. 64 (1975). This is part of the legislative history of the new Copyright Act.

limit "fair use" of his data. If, however, he authorizes further distribution and public display of the data base, he will have published and will thereby have less control over the fair uses to which his data may be put.

#### 4. Infringement: Proof and Recovery

As of this date, no decisions have been published defining the standards for finding copyright infringement of a computer program.<sup>235</sup> However, it has been suggested that courts should consider the following factors: the focus and purpose of the original and allegedly copied program; any similarity in the operating sequences; the significance of dissimilar material; common errors; and the appearance or repetition of unique or qualitatively significant terms.<sup>236</sup> "The appearance of these elements, cumulatively weighed, would establish the inference of copying, which would shift to the alleged infringer the burden of establishing the independent nature of his program."<sup>237</sup>

These elements reflect the fact that one method of rendering program copyright infringement detectable is for the proprietor to insert identification akin to the fictitious addresses sometimes inserted in copyrighted directories.<sup>238</sup> Such a technique would aid in detecting infringement when an entire work has been copied; however, this method might be inadequate when only segments of a copyrighted work were the subject of an alleged infringement.

In computer copyright infringement cases, courts may also experience difficulty in determining how much alteration must be done to an original work before the altered work is no longer a copy.

It is not possible to define clearly how much or how many changes can be made in an original copyrighted work and yet be encompassed within the purview of a prohibited copy. The most that can be definitely stated is that in order for a reproduction to constitute a copy the alleged copy must contain some of the essential nature, substance or personality of the author's original creation.<sup>239</sup>

---

235. In neither *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F. Supp. 171 (N.D. Cal. 1981), nor *Data Cash Syss., Inc. v. JS&A Group, Inc.*, 480 F. Supp. 1063, 7 Computer L. Serv. Rep. (Callaghan) 1004 (N.D. Ill. 1979), *aff'd on other grounds*, 628 F.2d 1038, 7 Computer L. Serv. Rep. (Callaghan) 1438 (7th Cir. 1980), did the courts find it necessary to formulate a standard for infringement of the copyrighted computer programs.

236. Note, *Protection of Computer Programs: Resurrection of the Standard*, 50 NOTRE DAME LAW. 333, 341 (1974).

237. *Id.*

238. There may be no need to intentionally insert such bugs since most programs of sufficient length include a substantial number of errors, giving them "their own personalities." Galbi, *Copyright and Unfair Competition Law as Applied to the Protection of Computer Programming*, 3 COMPUTER L. SERV. (CALLAGHAN) § 4-3, art. 1, at 13 (1978).

239. *Id.* at 11.

Whenever it is alleged that an infringing computer program has been written by copying a copyrighted flow program, part of the test for infringement should involve an analysis of the levels of detail in the diagram and the allegedly infringing program.<sup>240</sup> The "new" program, which has not been sufficiently altered to lose the status of a "copy," should closely conform to the copied diagram in level of detail, which can vary greatly. Whatever test is applied to detect adaptations, it is clear that under the new copyright law unauthorized adaptations of copyrighted works do constitute infringement, and defendants will need to devote significant efforts to prove that their works qualify as independent creations.

The remedies available to a copyright owner upon proof of infringement include injunctive relief,<sup>241</sup> impoundment and destruction of infringing articles,<sup>242</sup> and damages.<sup>243</sup> The copyright owner can recover the infringer's profits simply by proving the infringer's gross revenue. The burden is then on the infringer to show that he had deductible expenses or "elements of profit attributable to factors other than the copyrighted work."<sup>244</sup> Alternatively, the owner may elect to recover statutory damages, which may range from \$250 to \$10,000 in ordinary infringement cases and up to \$50,000 in the case of willful infringement.<sup>245</sup> The court may also award the plaintiff costs and reasonable attorneys' fees.<sup>246</sup> Additionally, criminal sanctions are available for copyright infringement and fraud, including fines up to \$10,000 and one year maximum imprisonment.<sup>247</sup>

Copyright protection should be sought, if available, because of the low costs of copyright registration<sup>248</sup> and the frequent success of plaintiffs in copyright infringement suits.<sup>249</sup> Under the rates effective January 1, 1978, the basic fee for registration of copyright claims is only ten dollars,<sup>250</sup> and copyright plaintiffs prevail about seventy percent of the time.<sup>251</sup> When compared to patent claims — in which enormous attorneys' fees are incurred to prove a process is patentable subject matter

---

240. *Id.* at 12-13.

241. 17 U.S.C. § 502(a) (Supp. IV 1980).

242. *Id.* § 503(b).

243. *Id.* § 504.

244. *Id.* § 504(b).

245. *Id.* § 504(c).

246. *Id.* § 505. Section 412 provides that statutory damages and attorneys' fees will generally not be available when infringement occurs prior to registration or, in the case of published works, prior to registration, "unless such registration is made within three months after the first publication of the work." *Id.* § 412.

247. *Id.* § 506(a).

248. *See id.* § 708.

249. *See, e.g.,* Walt Disney Prod. v. Alaska Television Network, Inc., 310 F. Supp. 1073, 1075 (W.D. Wash. 1969); Prasinios, *Worldwide Protection of Computer Programs by Copyright*, 4 RUTGERS J. COMPUTERS & L. 42, 51-52 (1974).

250. 17 U.S.C. § 708(a)(1) (Supp. IV 1980).

251. Prasinios, *Worldwide Protection of Computer Programs by Copyright*, 4 RUTGERS J. COMPUTERS & L. 42, 51-52 (1974).

and plaintiffs succeed only about thirty percent of the time — the wisdom of securing a copyright, whenever possible, becomes apparent.<sup>252</sup>

### C. Patentability of Computer Software

The large number of articles published on the subject of computer software patentability during the last twenty years illustrates the great interest of both the software industry and the legal community in this form of proprietary protection.<sup>253</sup> Patent protection is comprehensive, surpassing copyright and trade secret law in its benefits to the holder.<sup>254</sup> Patents would afford software manufacturers with protection for both the substance and form of the inventive concepts embodied in computer programs, giving the patent holders a limited monopoly on their inventions, enforceable without a showing of unethical acquisition.<sup>255</sup> These advantages make it easy to understand why the software industry has sought to have its products included within the scope of federal patent protection.<sup>256</sup> However, the questions of whether and to what extent computer programs are patentable remain unresolved. Courts and the Patent and Trademark Office (PTO) are constantly seeking resolution of these questions, within the precedents set and latitude left by prior case law and the language and requirements of the patent statute.<sup>257</sup>

---

252. A further advantage in obtaining a copyright is that it offers uniform federal and international protection. Since 1955, the United States has been a member of the Universal Copyright Convention, to which most industrialized nations belong. The copyright protection afforded a work of authorship upon its publication with notice in any one of the member countries is also given in the other member countries.

253. For a comprehensive bibliography, see Nimtz, *Development of the Law of Computer Software Protection*, 61 J. PAT. OFF. SOC'Y 3, 26-43 (1979).

254. Note, *Patentability of Computer Programs*, 27 U. MIAMI L. REV. 494, 496-97 (1973). See generally Nycum, *Legal Protection for Computer Programs*, 1 COMPUTER L.J. 1, 72-73 (1978).

255. Note, *Patentability of Computer Programs*, 27 U. MIAMI L. REV. 494, 496 (1973).

256. Nevertheless, conflicting opinions exist as to the desirability of patent protection for computer software. The hardware industry, perhaps the strongest opponent to software patentability, Scaffetta, *Computer Software Protection: The Copyright Revision Bills and Alternatives*, 8 J. MAR. J. PRAC. & PROC. 381, 393 (1975), cites two adverse effects on that industry if software patents are allowed. The first is that the existence of patent monopolies on computer software may impede effective development and utilization of computers. *Id.* Secondly, hardware manufacturers believe that the acceptance of software as a machine process will lead to the conclusion that the bundling of free software and priced hardware constitutes an antitrust violation, as an illegal tie-in arrangement. *Id.* at 394. In contrast, software manufacturers assert that if patents are not allowed, software developers will be forced to seek protection from state trade secret laws. *Id.* at 394-95. Moreover, unpatentability allegedly thwarts university research and diminishes the staying power of minority groups in the software industry. *Id.*

257. The Patent Act of 1952 is codified at 35 U.S.C. §§ 1-376 (1976 & Supp. III 1979).

## 1. Statutory Requirements

Section 101 of the Patent Act provides that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of [the Act]."<sup>258</sup> A method, apparatus, or combination of the two may be patented, including a new use of a known process, machine, manufacture, composition of matter or material.<sup>259</sup> However, the Act has been interpreted to exclude mathematical, mental and logical formulae, methods or steps, ideas, discoveries of natural laws or physical phenomena, methods of doing business, and printed matter.<sup>260</sup> The question arising as to software patentability is whether such products fall within the statutory classes of subject matter, which evolved before the development of computer technology and, therefore, understandably fail to expressly include computer software.<sup>261</sup>

Any submission for patent protection must be novel, useful, and nonobvious. The invention cannot have been previously "known or used by others in this country, or patented or described in a printed publication in this or a foreign country."<sup>262</sup> "Usefulness" has been interpreted to mean that the submitted invention must do something, in the technological sense.<sup>263</sup> The Patent Act explains the nonobvious requirement as follows:

A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.<sup>264</sup>

---

258. *Id.* § 101.

259. *Id.* § 100(b) (1976). As terms of art in patent law, "process" is interchangeable with "method" and "apparatus" with "machine." *In re Chatfield*, 545 F.2d 152, 161, 6 Computer L. Serv. Rep. (Callaghan) 52, 67 (C.C.P.A. 1976) (Rich, J., dissenting), *cert. denied*, 434 U.S. 875 (1977). "[G]iven an invention which is in essence a new program for a general purpose digital computer, a competent draftsman can readily define the invention as either a process or machine or both." *Id.* at 160, 6 Computer L. Serv. Rep. (Callaghan) at 64 (Rich, J., dissenting).

260. *Gottschalk v. Benson*, 409 U.S. 63, 67-72, 3 Computer L. Serv. Rep. (Callaghan) 256 (1972).

261. *In re Chatfield*, 545 F.2d 152, 159, 6 Computer L. Serv. Rep. (Callaghan) 52, 63 (C.C.P.A. 1976) (Rich, J., dissenting), *cert. denied*, 434 U.S. 875 (1977).

262. 35 U.S.C. § 102 (1976).

263. *See Isenstead v. Watson*, 157 F. Supp. 7, 9, 115 U.S.P.Q. (BNA) 408, 409 (D.D.C. 1957). *See generally* 35 U.S.C. § 101 (1976).

264. 35 U.S.C. § 103 (1976). In *Graham v. John Deere Co.*, 383 U.S. 1 (1966), the United States Supreme Court shed some light on how nonobviousness is to be measured. First, the prior art must be determined; next, the differences between it and the claimed invention must be assessed; and then the ordinary level of skill in the pertinent art must be resolved. *Id.* at 17. Consideration will also be given to

Sections 111 through 146 of the Act detail the procedure that a patent applicant must follow.<sup>265</sup> Section 112, for example, requires the applicant to disclose his invention with specificity:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.<sup>266</sup>

The successful applicant, as patentee, is granted "the right to exclude others from making, using, or selling the invention throughout the United States" for a period of seventeen years.<sup>267</sup> Sections 271 through 293 of the Act define patent infringement,<sup>268</sup> providing for a

---

"commercial success," "the failure of others," and "long felt but unsolved needs." *Id.* at 17-18. See text accompanying notes 373-77 *infra*.

265. 35 U.S.C. §§ 111-146 (1976 & Supp. III 1979). A person seeking a patent must file his application with the Commissioner of Patents so that the application may be inspected by an examiner. *Id.* § 111. The claim can be submitted and rejected several times before it is refined to an acceptable level of novelty. *Id.* § 132. If a rejected claim is not prosecuted within six months, it is considered abandoned. *Id.* § 133. An applicant may take a twice-rejected claim to the Patent Office Board of Appeals, *id.* § 134, and, if denied relief there, he may either appeal to the Court of Customs and Patent Appeals or bring suit against the Commissioner of Patents in the United States District Court for the District of Columbia. *Id.* §§ 141, 145. Should the applicant prevail in either of these courts, then a patent is directed to be issued by the Commissioner of Patents and Trademarks. *Id.* §§ 145-146.

266. *Id.* § 112.

267. *Id.* § 154.

268. *Id.* § 271. The meaning of infringement has been defined by the courts through the doctrine of equivalents. *Graver Tank & Mfg. Co. v. Linde Air Prods.*, 339 U.S. 605, 608-09 (1950). Under this judicially developed doctrine, a court may find literal infringement "where the infringing device . . . is identical to the supporting disclosure of the patent or can be found as taught within the disclosure of the patent." Scafetta, *Programming Technology as an Infringement*, 5 AM. PAT. L.A.Q.J. 35, 38 (1977). However, if the infringing device "performs substantially the same function in substantially the same way to obtain the same result," a patentee may invoke the doctrine of equivalents even if the infringing device is not identical to or suggested by his disclosure. *Graver Tank & Mfg. Co. v. Linde Air Prods.*, 339 U.S. at 608-09 (quoting *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 42 (1929)). One commentator has noted that "the doctrine of equivalents, which is especially applicable to a many-stepped process such as a computer program, prevents a prospective infringer from avoiding infringement liability by substituting for a part of the process its equivalent." Note, *Patentability of Computer Programs*, 27 U. MIAMI L. REV. 494, 496 (1973).

When a software inventor succeeds in obtaining a patent, how much practical protection will it afford him? Certainly if literal infringement is found, as where a software programming method is copied by an unauthorized infringer, the software patent holder will be entitled to damages. *Milgo Elec. Corp. v. United Telecommunications, Inc.*, 6 Computer L. Serv. Rep. (Callaghan) 899 (D. Kan. 1978). But the problem of the actual scope of protection arises because hardware circuitry, which is the functional equivalent of software programs, might be

civil action<sup>269</sup> in which a patentee can recover damages "adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer."<sup>270</sup>

Despite the apparent inclusion of computer programs within the statutory framework of the Patent Act, the PTO declared programs to be unpatentable in its 1968 guidelines.<sup>271</sup> The Patent Office rescinded these guidelines<sup>272</sup> largely because the Court of Customs and Patent Appeals (CCPA) refused to adhere to them.<sup>273</sup> Nevertheless, the Patent Office has continued to reject programming claims with some regularity.<sup>274</sup> The accessibility of the United States District Court for the District of Columbia<sup>275</sup> has had less of a positive impact on software patentability because this court has not shared the CCPA's liberality in ordering the issuance of program patents.<sup>276</sup> Only rarely has the United States Supreme Court spoken on the issue and, on all but one occasion,<sup>277</sup> it has reversed the CCPA.<sup>278</sup> Therefore, the status of program patentability can best be understood in light of the history of Pat-

---

designed to carry out the same function as a disclosed software method or apparatus claim. Will such hardware be the legal equivalent of the software invention so as to constitute patent infringement? This question may become increasingly important since "[i]ntegrated circuits now eliminate the need for software means in special-purpose computers." Scafetta, *Programming Technology as an Infringement*, 5 AM. PAT. L.A.Q.J. 35, 35 (1977). "Even though the present problem is just beginning to generate litigation, it promises to foment greater difficulties as more sophisticated programming technology, such as the integrated circuit, becomes cheaper, faster, smaller and more versatile." *Id.*

Since the commercial debut of computer software and hardware, the Supreme Court has not spoken on the effect of the doctrine of equivalents or on the broadness of patent protection for means plus function claims. *Id.* at 38. See note 288 *infra* for definition of "means plus function." Some lower courts have had occasion, however, to rule on this issue. *E.g.*, *Digitronics Corp. v. New York Racing Assoc., Inc.*, 187 U.S.P.Q. (BNA) 602 (E.D.N.Y. 1975), *aff'd*, 553 F.2d 740 (2d Cir. 1977); *Bullard Co. v. General Elec. Co.*, 234 F. Supp. 995 (W.D. Va. 1964), *aff'd*, 348 F.2d 985 (4th Cir. 1965).

269. 35 U.S.C. § 281 (1976).

270. *Id.* § 284.

271. 33 Fed. Reg. 15,609-10 (1968).

272. 34 Fed. Reg. 15,724 (1969).

273. See, e.g., *In re Prater*, 415 F.2d 1378, 159 U.S.P.Q. (BNA) 583 (C.C.P.A. 1968), *modified*, 415 F.2d 1393, 2 Computer L. Serv. Rep. (Callaghan) 32 (C.C.P.A. 1969).

274. Ross, *The Patentability of Computer "Firmware"*, 59 J. PAT. OFF. SOC'Y 731, 753 (1977). "The PTO has established a separate classification for software-related inventions, namely Class 444 . . . Few patents in Class 444, however, have been issued, especially in recent years." *Id.*

275. See note 265 *supra*.

276. Comment, *Patentability: Piecing Together the Computer Software Patent Puzzle*, 19 ST. LOUIS U.L.J. 351, 354 n.23 (1975).

277. *Diamond v. Diehr*, 450 U.S. 175 (1981), *aff'g* 602 F.2d 982 (C.C.P.A. 1979).

278. *Parker v. Flook*, 437 U.S. 584, 6 Computer L. Serv. Rep. (Callaghan) 833 (1978), *rev'g In re Flook*, 559 F.2d 21, 6 Computer L. Serv. Rep. (Callaghan) 426 (C.C.P.A. 1977); *Dann v. Johnston*, 425 U.S. 219, 5 Computer L. Serv. Rep. (Callaghan) 1133 (1976), *rev'g In re Johnston*, 502 F.2d 765, 4 Computer L. Serv. Rep. (Callaghan) 1491 (C.C.P.A. 1974); *Gottschalk v. Benson*, 409 U.S. 63, 3



ent Office Board of Appeals, CCPA and Supreme Court rulings on programming claims.

## 2. The Decisional Debate Over Computer Software Patentability

The earliest reported decision involving software patentability was *Ex parte King*.<sup>279</sup> In that case, the Patent Office Board of Appeals affirmed the examiner's rejection of the subject apparatus claim,<sup>280</sup> but disagreed that "apparatus operating on particular stored data through a particular stored program is . . . patentably no different than a computer absent such data and program."<sup>281</sup> The Board suggested that the combination of a computer program and the computer in which it is stored during operation might be patentable as a single machine — a special purpose computer — if the "prior art" of the computer did not contain a suggestion for the preparation of such a program.<sup>282</sup>

To deny patent protection to a novel structure it must be shown that the same was obvious at the time the invention was made. A program for a computer which is not made obvious by the prior art but only by appellants' disclosure is not available to teach appellants' invention. Since most general purpose computers have the recognized capability of simulating operations of many other computers or machines by suitable programming, this fact should afford no basis for a denial of a patent on all future novel computer configurations which the art does not make obvious.<sup>283</sup>

In its decision in *In re Prater*,<sup>284</sup> the CCPA relied on *King* in finding that an apparatus claim was patentable.<sup>285</sup> The applicants in *Prater* sought a patent on an improved method for determining the relative proportions of various known constituent gases in a gaseous mixture.<sup>286</sup> The patent application contained both process and apparatus claims.<sup>287</sup> The process claims were a conceptual description of the analysis method. The apparatus claim, on the other hand, was a general expla-

---

Computer L. Serv. Rep. (Callaghan) 256 (1972), *rev'g In re Benson*, 441 F.2d 682, 2 Computer L. Serv. Rep. (Callaghan) 1030 (C.C.P.A. 1971).

279. 146 U.S.P.Q. (BNA) 590, 1 Computer L. Serv. Rep. (Callaghan) 302 (Pat. Off. Bd. App. 1964).

280. The apparatus claim was rejected because the result or function could be accomplished "by routine application of the rules for handling data expressed in Polish Notation," a system of denoting mathematical expressions that was not novel with the applicants. *Id.* at 591, 1 Computer L. Serv. Rep. (Callaghan) at 305.

281. *Id.* at 591, 1 Computer L. Serv. Rep. (Callaghan) at 304.

282. *Id.*

283. *Id.* at 591, 1 Computer L. Serv. Rep. (Callaghan) at 304-05.

284. 415 F.2d 1393, 2 Computer L. Serv. Rep. (Callaghan) 32 (C.C.P.A. 1969).

285. *Id.* at 1405-06, 2 Computer L. Serv. Rep. (Callaghan) at 50-51. The apparatus claim involved reading on a new use (programming) made of an old machine (a digital computer). *Id.* at 1399, 2 Computer L. Serv. Rep. (Callaghan) at 35-36.

286. *Id.* at 1395-96, 2 Computer L. Serv. Rep. (Callaghan) at 34-35.

287. *Id.* at 1398-99, 2 Computer L. Serv. Rep. (Callaghan) at 44-51.

nation of the performance of the process in "means plus function" language.<sup>288</sup> The specifications that accompanied the apparatus claim described in great detail an analog device for performing the analysis and also noted that a general purpose digital computer could be used to perform the analysis.<sup>289</sup>

The examiner and Patent Office Board of Appeals rejected all of the method claims,<sup>290</sup> finding that they were not patentable under section 101 of the Patent Act because their novelty resided in a mental process.<sup>291</sup> This ground for rejection was based on *In re Abrams*,<sup>292</sup> in which the CCPA had held that processes having only mental novelty are unpatentable because they fall outside the statutory "process" class.<sup>293</sup> In *Abrams*, the court rejected the appellant's patent claim on a method for prospecting for petroleum because the novelty of the invention resided in the mental rather than the physical phase of the process.<sup>294</sup> From the *Abrams* case emerged the "mental steps" doctrine,<sup>295</sup> which formed the basis of many PTO decisions in the 1960's.

The examiner in *Prater* had found that each of the process claims could be read on<sup>296</sup> mental calculations and that the only novel subject matter in the claims were those calculations which were outside the

---

288. *Id.* at 1406, 2 Computer L. Serv. Rep. (Callaghan) at 51. A "means plus function" refers to any structure having the capacity to perform the function recited after the words "means for." P. ROSENBERG, PATENT LAW FUNDAMENTALS § 1409[1] (2d ed. 1982).

289. A general purpose computer performs operations by utilizing many different programs. A digital computer operates on numerically expressed data, performing math as a person would. In contrast, an analog computer expresses quantities as voltages, read from meters. Davis, *An Overview of Computer Data Processing*, 1 COMPUTER L. SERV. (CALLAGHAN) § 1-21, art. 1, at 2 (1979).

290. 415 F.2d 1393, 1398, 2 Computer L. Serv. Rep. (Callaghan) 32, 38 (C.C.P.A. 1969).

291. *Id.*

292. 188 F.2d 165 (C.C.P.A. 1951).

293. *Id.* at 169-70.

294. *Id.* at 169.

295. The mental steps doctrine can be broken down into three rules:

1) If all the steps of a claim are purely mental in character, the subject matter is not patentable.

2) If a method claim embodies both positive and physical steps as well as so-called mental steps, yet the alleged novelty or advance over the art resides in one or more of the mental steps, then the claim is considered unpatentable for the same reason that it would be if all the steps were purely mental in character.

3) If a claim embodies both positive and physical steps as well as mental steps, yet the novelty or advance over the art resides in one or more of the positive and physical steps and the mental steps are incidental parts of the process, *i.e.*, only essential to define, qualify or limit its scope, then the claim is patentable. *Id.* at 166.

296. "Reading on" is a shorthand phrase in patent law meaning that a broadly drafted claim has described a machine or process other than that specifically designated in the patent application. Note, *Protection of Computer Software — A Hard Problem*, 26 DRAKE L. REV. 180, 186 n.62 (1976-1977).

statutory classes.<sup>297</sup> The Board agreed saying, "It . . . [is] beside the point that the solution of the mathematical problem can be done by machine. The claims have set forth nothing which cannot be performed purely as a mental exercise using appellants' discovery that the equations having the largest determinant are the ones to use."<sup>298</sup> The examiner not only rejected the process claims as involving nonstatutory subject matter under section 101 but also indicated that since the claims read on subject matter outside the statutory class as well as within the class, the claims failed "to particularly point out and distinctly claim the invention,"<sup>299</sup> thus failing to meet the requirements of section 112.

For similar reasons, the examiner also rejected the apparatus claim. The basis of the rejection was that the claim merely involved programming a general purpose digital computer to perform the (unpatentable) required mathematical operations.<sup>300</sup> The claim also failed under section 103 of the Act because it would have been obvious to program a general purpose digital computer, which had been known and in public use.<sup>301</sup> Had the applicants' claim merely read on an analog device, it would have been patentable.<sup>302</sup> By disclosing both the digital computer and analog device, however, the applicants again failed under section 112 to particularly point out and distinctly claim a patentable invention.

In contrast to the Board, the CCPA distinguished the *Prater* process claims from those in *Abrams*. *Abrams*, the court said, disclosed a process that could be performed only in the mind. "Abrams had disclosed no means whatever for performing, without human intervention, two claimed steps of calculation and comparison."<sup>303</sup> In *Prater*, however, there was "full disclosure of at least analog apparatus for carrying out the claimed steps *without requiring any steps to be performed in the human mind*."<sup>304</sup> The court found, therefore, that the appellants had disclosed a statutorily patentable process.<sup>305</sup> However, the court went on to reject the method claims since the disclosure had not expressly limited the claims to show that the applicants were not seeking coverage on a purely mental process.<sup>306</sup> The court declined to read limitations into the claim.<sup>307</sup> Thus, pursuant to section 112, the specification failed to distinctly point out the subject matter of the purported invention even though a patentable machine-implemented process was

---

297. 415 F.2d 1393, 1398-99, 2 Computer L. Serv. Rep. (Callaghan) 32, 38 (C.C.P.A. 1969).

298. *Id.* at 1398, 2 Computer L. Serv. Rep. (Callaghan) at 39.

299. *Id.* at 1399, 2 Computer L. Serv. Rep. (Callaghan) at 39-40.

300. *Id.* at 1399, 2 Computer L. Serv. Rep. (Callaghan) at 40.

301. *Id.*

302. *Id.* at 1399, 2 Computer L. Serv. Rep. (Callaghan) at 41.

303. *Id.* at 1401-02, 2 Computer L. Serv. Rep. (Callaghan) at 44.

304. *Id.* at 1402, 2 Computer L. Serv. Rep. (Callaghan) at 44 (emphasis in original).

305. *Id.* at 1403, 2 Computer L. Serv. Rep. (Callaghan) at 47.

306. *Id.* at 1404-05, 2 Computer L. Serv. Rep. (Callaghan) at 47-50.

307. *Id.* at 1405, 2 Computer L. Serv. Rep. (Callaghan) at 49.

disclosed.<sup>308</sup>

Additionally, the CCPA disagreed with the examiner and allowed the apparatus claim stating:

Assuming the existence, at the time of the invention, of general-purpose digital computers as well as typical programming techniques therefor, it is nevertheless plain that appellants' invention . . . was not obvious . . . because one not having knowledge of appellants' discovery simply would not know what to program the computer to do.<sup>309</sup>

In so reasoning, the court upheld the finding in *King* that novel ways of programming a computer could be patentable apparatus claims. Additionally, although the court rejected the method claims, it did not do so without restricting application of the mental steps doctrine to processes requiring mental implementation.<sup>310</sup> The court also suggested a way in which applicants might amend defective claims: by clearly limiting them to machine implementation of the process that could be done mentally.<sup>311</sup> Thus, the CCPA eliminated the mental steps doctrine as an absolute obstacle to program patentability and illustrated its willingness to extend patent protection to computer programs.

In *In re Bernhart*,<sup>312</sup> the CCPA took a further step toward broadly extending patentability to computer software. In that case, the applicants sought a patent on a method and apparatus for converting a three-dimensional object into a two-dimensional portrayal.<sup>313</sup> Their disclosure provided equations definitive of the geometric relationships between the three-dimensional and two-dimensional coordinates of points to be portrayed. These equations were programmable into a computer. The examiner and the Board rejected both the apparatus and method claims.<sup>314</sup> The apparatus claims were rejected because their only novelty lay in the equations disclosed, which did not create a structural difference over the prior art.<sup>315</sup> Additionally, the PTO held that the applicants' apparatus type was old since it only combined a digital computer with a plotting device.<sup>316</sup> Similarly, the method claims were rejected because their novelty also existed only in the equations to be solved, the method thus reading on nonstatutory subject matter.<sup>317</sup>

On appeal, however, the CCPA allowed the apparatus claims.<sup>318</sup>

---

308. *Id.*

309. *Id.* at 1406, 2 Computer L. Serv. Rep. (Callaghan) at 51.

310. *Id.* at 1403, 2 Computer L. Serv. Rep. (Callaghan) at 46-47.

311. *Id.* at 1404-05, 2 Computer L. Serv. Rep. (Callaghan) at 48-49.

312. 417 F.2d 1395, 2 Computer L. Serv. Rep. (Callaghan) 359 (C.C.P.A. 1969).

313. *Id.* at 1396, 2 Computer L. Serv. Rep. (Callaghan) at 360.

314. *Id.* at 1398, 2 Computer L. Serv. Rep. (Callaghan) at 363-64.

315. *Id.*

316. *Id.* at 1398, 2 Computer L. Serv. Rep. (Callaghan) at 363.

317. *Id.* at 1398-99, 2 Computer L. Serv. Rep. (Callaghan) at 364.

318. *Id.* at 1399-1400, 2 Computer L. Serv. Rep. (Callaghan) at 364-67.

It was noted that no "mental steps" issue was involved because the means plus function language of the claims did not require or permit the incorporation of human faculties.<sup>319</sup> Recognizing that Congress intended to exclude mathematical equations from monopolization by patent, the court stated, "Accordingly, no rule of law should be announced which would impress a monopoly upon all uses of the equations disclosed by appellants . . . ."<sup>320</sup> But the court added:

To allow the claims in issue here would not prohibit all uses of those equations . . . . [A] member of the public would have to do much more than use the equations to infringe any of these claims. He would have to use them in the physical equipment recited in the claim. Moreover, all machines function according to laws of physics which can be mathematically set forth if known. We cannot deny patents on machines merely because their novelty may be explained in terms of such laws . . . . We should not penalize the inventor who makes his invention by discovering new and unobvious mathematical relationships which he then utilizes in a machine, as against the inventor who makes the *same machine* by trial and error and does not disclose the laws by which it operates.<sup>321</sup>

In response to the objection that the apparatus was structurally the same as an "old" computer, the court observed:

[I]f a machine is programmed in a certain new and unobvious way, it is physically different from the machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed. If a new machine has not been invented, certainly a "new and useful improvement" of the unprogrammed machine has been, and Congress has said . . . that such improvements are statutory subject matter for a patent. It may well be that the vast majority of newly programmed machines are obvious to those skilled in the art and hence unpatentable . . . . We are concluding here that such machines are statutory under 35 U.S.C. § 101, and that claims defining them must be judged for patentability in light of the prior art.<sup>322</sup>

The court also found that the method, disclosing the use of both a digital computer and a planar plotting apparatus, was statutory.<sup>323</sup> A finding that the claimed process could have been done mentally would have required the court "to hold that the human mind is a digital com-

---

319. *Id.* at 1400, 2 Computer L. Serv. Rep. (Callaghan) at 366.

320. *Id.* at 1399, 2 Computer L. Serv. Rep. (Callaghan) at 365.

321. *Id.* at 1399-1400, 2 Computer L. Serv. Rep. (Callaghan) at 365-66 (emphasis in original).

322. *Id.* at 1400, 2 Computer L. Serv. Rep. (Callaghan) at 366-67.

323. *Id.* at 1401, 2 Computer L. Serv. Rep. (Callaghan) at 368.

puter or its equivalent," and this the court was unwilling to do.<sup>324</sup>

Three months after its *Bernhart* decision, the CCPA upheld, in *In re Mahony*,<sup>325</sup> the applicant's method claim on a process for automatically synchronizing a receiver of digital information to carry out a logical process on a bit stream.<sup>326</sup> Although there was no express reference in the process claim to a machine-implemented process, the term "bit stream" had "a meaning in the art which precludes reading the claims on a mentally performable process."<sup>327</sup> The court distinguished *Prater*, in which it was unclear whether coverage was sought for mental or machine implementation of the process disclosed.<sup>328</sup> Through its comments in *Mahony*, the CCPA suggested that computer programs may be patentable if the inventor expressly or implicitly specifies them as processes that are to be performed without mental intervention.

*Prater*, *Bernhart* and *Mahony* illustrate the CCPA's early view that both newly programmed machines (apparatus) and logical steps or equations (process) were patentable as statutory subject matter, whether expressly or implicitly reading on the use of a machine, if they were nonobvious in light of the prior art and distinctly claimed. These cases severely eroded the mental steps doctrine, which was thereafter completely abandoned in *In re Musgrave*.<sup>329</sup> Instead, the technological arts doctrine, initiated in *Prater*, mandated that

patent protection for a process disclosed as being a sequence or combination of steps, capable of performance without human intervention and directed to an industrial technology — a "useful art" within the intendment of the Constitution — is not precluded by the mere fact that the process could alternatively be carried out by mental steps.<sup>330</sup>

---

324. *Id.* at 1401, 2 Computer L. Serv. Rep. (Callaghan) at 367-68.

325. 421 F.2d 742, 2 Computer L. Serv. Rep. (Callaghan) 587 (C.C.P.A. 1970).

326. *Id.* at 746, 2 Computer L. Serv. Rep. (Callaghan) at 592-93. A "bit" is an abbreviation for "binary digit." *Id.* In a "bit stream," bits are transmitted over a circuit in a consecutive line, character separation being accomplished by terminal equipment. *Id.*

327. *Id.* at 746-47, 2 Computer L. Serv. Rep. (Callaghan) at 594.

328. *Id.* at 747-48, 2 Computer L. Serv. Rep. (Callaghan) at 593-94.

329. 431 F.2d 882, 2 Computer L. Serv. Rep. (Callaghan) 920 (C.C.P.A. 1970). In *Musgrave*, the applicants sought a patent on a method for obtaining seismograms that delineated with a high degree of precision the nature of the subsurface formations in the earth's crust. *Id.* at 882, 2 Computer L. Serv. Rep. (Callaghan) at 920. All the patent claims were method claims and were rejected by the Patent Office because either all or some of the steps of the claims were "mental steps" and were relied on for patentability. *Id.* at 888, 2 Computer L. Serv. Rep. (Callaghan) at 925-26. Despite *Prater*, *Mahony*, and *Bernhart*, the CCPA reversed the PTO, dealing the mental steps doctrine its seemingly final blow. See *id.* at 888-90, 2 Computer L. Serv. Rep. (Callaghan) at 930-33. However, the mental steps doctrine apparently has been at least partially resurrected in *Gottschalk v. Benson*, 409 U.S. 63, 3 Computer L. Serv. Rep. (Callaghan) 256 (1972). See text accompanying notes 333-49 *infra*.

330. *In re Prater*, 415 F.2d 1378, 1389, 159 U.S.P.Q. (BNA) 583, 593 (C.C.P.A. 1968),

Applying the technological arts doctrine, the CCPA continued to reverse the Patent Office Board of Appeals' decisions denying software patentability<sup>331</sup> until the United States Supreme Court's decision in *Gottschalk v. Benson*.<sup>332</sup>

In *Benson*, the inventor had done work in developing a telephone switching system known as PBX.<sup>333</sup> PBX was "designed to interconnect telephones using electrical dial impulses emanating from the calling telephone which, because of their binary coded decimal (BCD) form, required conversion to binary form in a control unit before interconnection with the called telephone could occur."<sup>334</sup> A number of techniques for carrying out such a required conversion already existed, but using them in PBX was either impossible or unfeasible. Benson and his co-inventor, Tabbot, sought and finally discovered a new method of converting BCD representations into binary number representations. In their patent application, they detailed the problems posed by prior conversion methods and the specific advantages of their new process, such as "elimination of 'repetitive storing and retrieval';

---

*modified*, 415 F.2d 1393, 2 Computer L. Serv. Rep. (Callaghan) 32 (C.C.P.A. 1969). The *Musgrave* court said that method claims are not nonstatutory merely because some or all the steps therein can also be carried out in or with the aid of the human mind or because it may be necessary for one performing the processes to think. All that is necessary . . . to make a sequence of operational steps a statutory "process" within 35 U.S.C. § 101 is that it be in the technological arts so as to be in consonance with the constitutional purpose to promote the progress of "useful arts."

*In re Musgrave*, 431 F.2d 882, 893, 2 Computer L. Serv. Rep. (Callaghan) 920, 938 (C.C.P.A. 1970). Thus, the *Musgrave* court eliminated the notion that machine rather than mental implementation was determinative in deciding whether a method was statutory under § 101 of the Patent Act. *Id.* Though no assurance could be had that the Patent Office Board of Appeals would consider programming statutory subject matter, it seemed clear that as far as the CCPA was concerned, any process used in the field of electronic data processing that heralded progress would be patentable as long as it met the other statutory requirements, such as nonobviousness, novelty and sufficient disclosure. Note, *Protection of Computer Programs: Resurrection of the Standard*, 50 NOTRE DAME LAW. 333, 337 (1974).

331. *In re Waldbaum*, 457 F.2d 997, 3 Computer L. Serv. Rep. (Callaghan) 173 (C.C.P.A. 1972) (a method of analyzing data words to determine the number of "ones" they contain), *vacated*, 559 F.2d 611, 6 Computer L. Serv. Rep. (Callaghan) 415 (C.C.P.A. 1977); *In re McIlroy*, 442 F.2d 1397, 3 Computer L. Serv. Rep. (Callaghan) 81 (C.C.P.A. 1971) (a method for retrieving symbolic data from a stored string); *In re Benson*, 441 F.2d 682, 2 Computer L. Serv. Rep. (Callaghan) 1030 (C.C.P.A. 1971) (a method of converting binary coded decimal representations into binary number representations), *rev'd sub nom. Gottschalk v. Benson*, 409 U.S. 63, 3 Computer L. Serv. Rep. (Callaghan) 256 (1972); *In re Foster*, 438 F.2d 1011, 2 Computer L. Serv. Rep. (Callaghan) 994 (C.C.P.A. 1971) (a process to compensate for distortion in seismograms).

332. 409 U.S. 63, 3 Computer L. Serv. Rep. (Callaghan) 256 (1972), *rev'g In re Benson*, 441 F.2d 682, 2 Computer L. Serv. Rep. (Callaghan) 1030 (C.C.P.A. 1971).

333. Soltysinski, *Computer Programs and Patent Law: A Comparative Study*, 3 RUTGERS J. COMPUTERS & L. 1, 28 (1973).

334. *Id.*

enhanced accuracy by 'eliminating the need for interchanging signals among various equipment components'; and accomplishment of conversion without the need for 'auxiliary equipment.'<sup>335</sup>

Despite the apparent usefulness of the invention, the Patent Office Board of Appeals rejected the claims, as basically mental in character, because the method was directed to mathematical steps.<sup>336</sup> Reversing the Board's decision, the CCPA conceded that the process could be carried out manually, but noted that the inventor had disclosed machine implementation and that manual performance would be improbable.<sup>337</sup> The court believed that a reasonable interpretation of the claims would not include coverage of the process as implemented by the human mind since the claims had no practical use other than through utilization of a digital computer.<sup>338</sup> Because the process enhanced the operation of such a machine, the court held the invention was clearly within the technological arts and, thereby, a statutory process.<sup>339</sup>

The CCPA's interpretation of patentable subject matter was quickly circumscribed when the United States Supreme Court reversed the *Benson* decision, holding the patent invalid as an attempt to patent a mathematical formula.<sup>340</sup> The patent claims were unanimously<sup>341</sup> rejected on two seemingly inconsistent grounds. First, the Court objected to the overly broad nature of the claims:

The claims were not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use.

... Here the "process" claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure binary conversion. The end use may (1) vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery or without any apparatus.<sup>342</sup>

In calling the *Benson* claim "abstract" and "sweeping," the Court suggested that there was no limitation of the claim so as to confine the

335. *Id.* at 29 n.119.

336. *In re Benson*, 441 F.2d 682, 684, 2 Computer L. Serv. Rep. (Callaghan) 1030, 1034 (C.C.P.A. 1971), *rev'd sub nom.* *Gottschalk v. Benson*, 409 U.S. 63, 3 Computer L. Serv. Rep. (Callaghan) 256 (1972).

337. *Id.* at 687, 2 Computer L. Serv. Rep. (Callaghan) at 1039. The court also noted that although cash registers and adding machines also operate with numbers, this fact has never been considered a basis for declaring them to be nonstatutory subject matter. *Id.*

338. *Id.*

339. *Id.* at 688, 2 Computer L. Serv. Rep. (Callaghan) at 1041.

340. *Gottschalk v. Benson*, 409 U.S. 63, 3 Computer L. Serv. Rep. (Callaghan) 256 (1972).

341. Justices Stewart, Blackmun and Powell took no part in the decision.

342. *Id.* at 64-68, 3 Computer L. Serv. Rep. (Callaghan) at 256-59.



sought after monopoly within definite bounds.<sup>343</sup>

The Supreme Court's second objection was that the claimed process had "no substantial practical application except in connection with a digital computer."<sup>344</sup> It was believed that affirming the judgment below would be to permit the patenting of an idea — the mathematical formula — and, in effect, to grant a patent on the algorithm<sup>345</sup> itself.<sup>346</sup> The Court's apparent inconsistency in objecting to both the "sweeping" nature of the claim and its limited practical application raises questions as to the validity of the Court's reasoning.

Although some commentators believed that the *Benson* decision stigmatized software patentability,<sup>347</sup> others found solace in the following statement by the Court:<sup>348</sup>

We do not hold that no process patent could ever qualify if it

---

343. *Id.* Contrary to the CCPA's prior decisions in *Mahony* and *Musgrave*, see text accompanying notes 325-29 *supra*, after *Benson*, mental and process claims so broadly written that they may include both known and unknown uses will not be statutory subject matter, even if they advance the technological arts. Therefore, most processes will probably have to be tied to a specific machine. However, the Supreme Court did indicate in *Benson* that under certain conditions a process not tied to a particular apparatus might be patentable: "Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines." 409 U.S. 63, 70, 3 Computer L. Serv. Rep. (Callaghan) 256, 261 (1972). The Court thus breathed new life into the "change of state" doctrine, which had its origin in *Cochrane v. Deneer*, 94 U.S. 780 (1876). See Elacqua, In re Johnston: *Patentability of Computer Software—The Battle Rages On*, 2 OHIO N.U.L. REV. 782, 785 (1975). The transformation test far antedates the computer age. See, e.g., *Tilghman v. Procter*, 102 U.S. 707, 721 (1880). In applying that test in *Benson*, the Court decided the question of patentability of an intangible (a computer program) using standards established in cases based on tangible inventions. A better approach would have been to develop new standards of patentability that applied specifically to software inventions based on the policy considerations developed in the prior cases.

Even without the development of a new standard as a means of adjudicating *Benson*, the Court might have arrived at a different holding had it actually applied the transformation test to the *Benson* claim. The *Benson* claim met the requirements of the test, so the Court's holding suggests that either it failed to apply the test or applied it incorrectly because of its failure to understand the effect of a program on the operation of a computer. Such an understanding is "crucial to intelligent evaluation of the patentability issue." Note, *Protection of Computer Programs: Resurrection of the Standard*, 50 NOTRE DAME LAW. 333, 339 (1974).

344. 409 U.S. 63, 71-72, 3 Computer L. Serv. Rep. (Callaghan) 256, 262-63 (1972).

345. An algorithm is a procedure for solving a given type of mathematical problem by converting one form of numerical representation into another. *Id.* at 65, 3 Computer L. Serv. Rep. (Callaghan) at 257.

346. *Id.* This rationale for the Court's decision has generated comment by both courts and legal scholars. See *In re Castelet*, 562 F.2d 1236, 1239, 6 Computer L. Serv. Rep. (Callaghan) 787, 794 (C.C.P.A. 1977); Soltysinski, *Computer Programs and Patent Law: A Comparative Study*, 3 RUTGERS J. COMPUTERS & L. 1, 49-52 (1973); Comment, *Computer Program Classification: A Limitation on Program Patentability as a Process*, 53 OR. L. REV. 501, 521-30 (1974).

347. See Note, *Protection of Computer Programs: Resurrection of the Standard*, 50 NOTRE DAME LAW. 333, 339-40 (1974).

348. *Id.* at 338.

did not meet the requirements of our prior precedents. It is said that the decision precludes a patent for any program servicing a computer. We do not so hold. It is said that we have before us a program for a digital computer but extend our holding to programs for analog computers. We have, however, made clear from the start that we deal with a program only for digital computers. It is said we freeze process patents to old technologies, leaving no room for the revelations of the new, onrushing technology. Such is not our purpose.<sup>349</sup>

Because of these disclaimers, the effect of *Benson* on software patentability was unclear. Furthermore, the CCPA's subsequent interpretations severely narrowed the Court's holding.

Six months after *Benson*, the CCPA decided *In re Christensen*.<sup>350</sup> In that case, the method claimed was a process for determining subsurface porosity.<sup>351</sup> The Board rejected the claim because the alleged advance over the prior art resided in nonstatutory subject matter — the application of a formula to calculate values of a known parameter.<sup>352</sup> Although Christensen's invention was not a computer program, the CCPA held, based upon *Benson*,<sup>353</sup> that the method claim, in which the novelty was a mathematical equation to be solved as the final step, was

349. 409 U.S. 63, 71, 3 Computer L. Serv. Rep. (Callaghan) 256, 262 (1972).

350. 478 F.2d 1392, 4 Computer L. Serv. Rep. (Callaghan) 66 (C.C.P.A. 1973).

351. *Id.* at 1392, 4 Computer L. Serv. Rep. (Callaghan) at 66.

352. *Id.* at 1393, 4 Computer L. Serv. Rep. (Callaghan) at 67.

353. *Id.* at 1393, 4 Computer L. Serv. Rep. (Callaghan) at 69-70. Judge Rich, who wrote the CCPA's decision in *Benson*, remarked in his concurring opinion in *Christensen* that after framing the issue in *Benson* as "whether the method described and claimed is a 'process' within the meaning of the Patent Act," the Supreme Court never again adverted to the issue, but instead discussed the patentability of programs for digital computers, despite the fact that no program was before the Court. *Id.* at 1395, 4 Computer L. Serv. Rep. (Callaghan) at 71 (Rich, J., concurring). This fact raises the possibility that the Supreme Court's consideration of software patentability in *Benson* could be viewed merely as dicta. Elacqua, *In re Johnston: Patentability of Computer Software — The Battle Rages On*, 2 OHIO N.U.L. REV. 782, 785 (1975).

Judge Rich believed that the Supreme Court's reasoning in *Benson* had more bearing on the *Christensen* claim than on the *Benson* claim, in that the *Christensen* claim contained a mathematical formula whereas, in Rich's view, the *Benson* claim did not. 478 F.2d 1392, 1396, 4 Computer L. Serv. Rep. (Callaghan) 66, 72 (C.C.P.A. 1973) (Rich, J., concurring). Being obliged "under the rules of the legal game . . . to follow [the Supreme Court's] lead as best we can," *id.*, Rich agreed that the *Christensen* claim was not patentable, but he gave a hint regarding the CCPA's inclinations in future decisions by adding:

But for the *Benson* decision, I would reverse the rejection here because I see no reason why such a specific, useful, technological process as a process for determining subsurface porosity, concededly a contribution to the useful arts, cannot be defined in the language of mathematics which is widely used as a medium of communication in that field. I have no more doubt that it is a "process" within the meaning of § 101 than I had about Benson's process . . . .

*Id.* at 1396, 4 Computer L. Serv. Rep. (Callaghan) at 73 (Rich, J., concurring).

nonstatutory.<sup>354</sup>

A few months later, the CCPA indicated in *In re Knowlton*<sup>355</sup> that it would continue to grant patents to computer programs when framed as apparatus claims.<sup>356</sup> The invention in that case was a system for the computer processing of list information, to be used with a general purpose digital computer.<sup>357</sup> Shortly thereafter, in *In re Comstock*,<sup>358</sup> the CCPA again allowed an apparatus claim on an electronic calculator.<sup>359</sup> The application disclosed that retrieval of numerical data placed into storage on a first-in, first-out basis could be effected through the proper programming of an IBM 1620 computer.<sup>360</sup> Despite the Patent Office Board of Appeals' rulings to the contrary,<sup>361</sup> the CCPA apparently believed that the failure to tie the means to a specifically named and detailed computer system does not render a programming apparatus claim unpatentable under section 112.<sup>362</sup> In both *Comstock* and *Knowl-*

---

354. 478 F.2d 1392, 1396, 4 Computer L. Serv. Rep. (Callaghan) 66, 70 (C.C.P.A. 1973).

355. 481 F.2d 1357, 4 Computer L. Serv. Rep. (Callaghan) 799 (C.C.P.A. 1973).

356. *Id.* at 1368-69, 4 Computer L. Serv. Rep. (Callaghan) at 815-16.

357. *Id.* at 1358-61, 4 Computer L. Serv. Rep. (Callaghan) at 800-05.

358. 481 F.2d 905, 4 Computer L. Serv. Rep. (Callaghan) 818 (C.C.P.A. 1973).

359. *Id.* at 909-10, 4 Computer L. Serv. Rep. (Callaghan) at 824.

360. *Id.* at 906-07, 4 Computer L. Serv. Rep. (Callaghan) at 818-21.

361. *In re Comstock*, 481 F.2d 905, 908-09, 4 Computer L. Serv. Rep. (Callaghan) 818, 821-23 (C.C.P.A. 1973); *In re Knowlton*, 481 F.2d 1357, 1361-63, 4 Computer L. Serv. Rep. (Callaghan) 799, 805-08 (C.C.P.A. 1973).

362. 481 F.2d 905, 909, 4 Computer L. Serv. Rep. (Callaghan) 818, 823-24 (C.C.P.A. 1973). It is also significant that the CCPA supported its decision in *Comstock* by citing *Bernhart*, which the court apparently considered still valid despite the *Benson* decision. *See id.* One commentator has phrased the impact of *Knowlton* and *Comstock* more cautiously: "The language of the court . . . may lead to the conclusion that programs are patentable at least in situations where patent claims are so drawn that they direct attention to a specific computer as it is altered by the particular program." Comment, *Patentability: Piecing Together the Computer Software Patent Puzzle*, 19 ST. LOUIS U.L.J. 351, 368 (1975).

During the same time period as *Knowlton* and *Comstock*, the CCPA also decided *In re Doyle*, 482 F.2d 1385, 4 Computer L. Serv. Rep. (Callaghan) 933 (C.C.P.A. 1973), *cert. denied*, 416 U.S. 935 (1974), and, shortly thereafter, *In re Brandstadter*, 484 F.2d 1395, 4 Computer L. Serv. Rep. (Callaghan) 976 (C.C.P.A. 1973). In *Doyle*, the invention was a method for automatically producing data for garment patterns of all desired sizes from a single reference pattern; the method was carried out by means of a digital computer. 482 F.2d at 1386, 4 Computer L. Serv. Rep. (Callaghan) at 934. The CCPA affirmed the Board's rejection of the claim because the applicant had not described how the computers were operated so as to enable a skilled programmer to prepare a program to use the disclosed methods. *Id.* at 1390, 4 Computer L. Serv. Rep. (Callaghan) at 941. In *Brandstadter*, the invention claimed was an apparatus for allowing subscribers of a communications system to store and retrieve previously originated data messages. 484 F.2d at 1396, 4 Computer L. Serv. Rep. (Callaghan) at 977. The CCPA affirmed the Board's § 112 rejection of the claim on the grounds that the appellants had failed to disclose the elements of a stored program making up part of the apparatus and had failed to indicate the amount of time and level of skill which would be required to do the programming. *Id.* at 1406-07, 4 Computer L. Serv. Rep. (Callaghan) at 992-94. These cases provide a key to the disclosure standards that will be imposed to limit program patentability and, perhaps more impor-

ton the apparatus claims were allowed, based on the fact that a program that would alter a specific computer was disclosed, even though neither contained a specification of the structure of the computer used.

In 1974, the CCPA decided *In re Johnston*<sup>363</sup> and provided grist for the Supreme Court's next opportunity to discuss the patentability of computer programming. The appellants in *Johnston* sought method and apparatus patents on an automatic financial record-keeping system that employed a digital computer.<sup>364</sup> The general control directing the invention was a software computer program, intended for use in a general purpose digital computer and providing bank customers with a categorized breakdown of their transactions. The Patent Office Board of Appeals rejected all of the claims as nonstatutory subject matter, based on its view that the invention extended beyond the field of the technological arts.<sup>365</sup> In other words, the Board felt that granting this patent would create a monopoly on a method of conducting banking business and would be an intrusion by the patent system into the social sciences. All the claims were further rejected under section 103 as being "obvious" variations of systems of bookkeeping used by banks and other industries.<sup>366</sup>

The CCPA reversed the Board's rejection of the four apparatus claims appealed, holding that "[r]ecord-keeping *machine* systems are clearly within the 'technological arts.'" <sup>367</sup> The court stated that it was unaware of "any dictionary that would define a *machine* system as within the purview of the 'liberal arts.'" <sup>368</sup> Unlike *Benson*, the court noted that "the instant claims, in *apparatus* form, [did] not claim or encompass a law of nature, a mathematical formula, or an algorithm." <sup>369</sup> The CCPA indicated that the technological arts doctrine had survived *Benson*, which had merely considered the issue of whether "a formula for converting binary coded decimal numerals into pure binary numbers by a series of mathematical calculations was a patentable process." <sup>370</sup> By thus narrowing the *Benson* holding, the

---

tantly, they indicate that programs will be patentable when they are sufficiently disclosed as parts of method and apparatus claims. At a minimum, "a program listing is required to avoid rejection for non-disclosure." Note, *Protection of Computer Software — A Hard Problem*, 26 DRAKE L. REV. 180, 189 (1976-1977). Nevertheless, even if a program method fails under the *Benson*-like "mental process" test, it may still be potentially patentable as part of an apparatus claim. See *In re Gunn*, 537 F.2d 1123, 6 Computer L. Serv. Rep. (Callaghan) 248 (C.C.P.A. 1976).

363. 502 F.2d 765, 4 Computer L. Serv. Rep. (Callaghan) 1491 (C.C.P.A. 1974), *rev'd sub nom.* *Dann v. Johnston*, 425 U.S. 219, 5 Computer L. Serv. Rep. (Callaghan) 1133 (1976).

364. *Id.* at 768, 4 Computer L. Serv. Rep. (Callaghan) at 1497.

365. *Id.* at 769, 4 Computer L. Serv. Rep. (Callaghan) at 1498.

366. *Id.* at 769-70, 4 Computer L. Serv. Rep. (Callaghan) at 1499.

367. *Id.* at 771, 4 Computer L. Serv. Rep. (Callaghan) at 1501 (emphasis in original).

368. *Id.* (emphasis in original).

369. *Id.* at 771, 4 Computer L. Serv. Rep. (Callaghan) at 1502 (emphasis in original).

370. *Id.* (quoting *In re Christensen*, 478 F.2d 1392, 4 Computer L. Serv. Rep. (Callaghan) 66 (C.C.P.A. 1973)).

CCPA created a basis for eroding the effect of the *Benson* decision and for distinguishing it out of existence.

Significantly, the Supreme Court did not disturb the CCPA's reasoning on the section 101 issue when it reviewed *Johnston*.<sup>371</sup> Nevertheless, the Court reversed the CCPA's decision based on a finding of obviousness.<sup>372</sup> The Court was guided by the factors it had set forth in *Graham v. John Deere Co.*<sup>373</sup> In *Graham*, the Court had held that the central factors relevant to any inquiry into obviousness are "the scope and content of the prior art," the "differences between the prior art and the claims at issue" and the "level of ordinary skill in the pertinent art."<sup>374</sup> Application of these factors in *Johnston* led the Court to conclude, "The gap between the prior art and respondent's system is simply not so great as to render the system non-obvious to one reasonably skilled in the art."<sup>375</sup> The Court noted that, while it had said in *Graham* that "'secondary considerations [such] as commercial success, long felt but unsolved needs, [and] failure of others'" might be relevant in determining obviousness,<sup>376</sup> none of those considerations offered substantial support for the claims of nonobviousness.<sup>377</sup>

After having another of its decisions on a software patent struck down in *Johnston*, the CCPA decided *In re Chatfield*<sup>378</sup> and *In re Noll*<sup>379</sup> and, through narrow interpretation of *Benson*, indicated its intention to continue favoring patent protection for software. Noll's invention was an apparatus for displaying text supplied by a computer or similar source on a cathode ray tube.<sup>380</sup> The hardware used was not novel but was under control of a novel program which transformed the digital computer into a system for scan-converting data. The invention was distinguished from the prior art, a hardwired circuitry apparatus enabling the same kind of graphic display through scan conversion, in that it operated under the control of a program with its attendant flexibility.<sup>381</sup> The Board rejected several of Noll's claims, based on inadequate disclosure and nonstatutory subject matter,<sup>382</sup> stating:

---

371. *Dann v. Johnston*, 425 U.S. 219, 220, 5 Computer L. Serv. Rep. (Callaghan) 1133, 1134 (1976).

372. *Id.* at 230, 5 Computer L. Serv. Rep. (Callaghan) at 1142.

373. 383 U.S. 1 (1966).

374. *Id.* at 17.

375. *Dann v. Johnston*, 425 U.S. 219, 230, 5 Computer L. Serv. Rep. (Callaghan) 1133, 1142 (1976).

376. *Id.* at 230 n.4, 5 Computer L. Serv. Rep. (Callaghan) at 1141 n.4 (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966)).

377. *Id.*

378. 545 F.2d 152, 6 Computer L. Serv. Rep. (Callaghan) 52 (C.C.P.A. 1976), *cert. denied*, 434 U.S. 875 (1977).

379. 545 F.2d 141, 6 Computer L. Serv. Rep. (Callaghan) 69 (C.C.P.A. 1976), *cert. denied*, 434 U.S. 875 (1977).

380. *Id.* at 142, 6 Computer L. Serv. Rep. (Callaghan) at 69.

381. *Id.* at 144, 6 Computer L. Serv. Rep. (Callaghan) at 71-72.

382. *Id.* at 145-47, 6 Computer L. Serv. Rep. (Callaghan) at 74-78.

To allow an applicant to secure patent protection by apparatus claims to subject matter, the only disclosure for which is an equivalent computer program, after the decision in the *Benson* et al. case would be, in our opinion, to allow him to do by indirection what the Supreme Court has indicated he should not be allowed to do directly, e.g., obtain protection of the computer program as such.<sup>383</sup>

The CCPA reversed the section 101 rejection, finding that, however broadly *Benson* might be interpreted, it was limited to "method claims such as those presented in that case."<sup>384</sup> Noll's was an apparatus claim, drawn to a physical structure, not to an algorithm or abstract law, and was limited to a particular technology. The CCPA also reversed the section 112 rejection holding that, once the applicant had described the "means" of his claim, the specified general purpose computer and equivalents thereof, he need not describe the full range of equivalents of his invention.<sup>385</sup>

Thus, in what seems to have been its determination to allow patents for programs, the CCPA distinguished *Noll* from *Benson* by noting that no method claim was involved in *Noll*. However, in *Chatfield*, decided concurrently, the applicant had appealed from the Patent Office's rejection of his claims for a method of operating a multiprogrammed computer system.<sup>386</sup> The Board found that the claims read on nonstatutory subject matter because, like the claims in *Benson*, they included a mathematical formulation and an algorithm for solving it and because the "end use" claims were unlimited.<sup>387</sup> Although the CCPA found that no "processing program" was claimed in *Chatfield*, it took the opportunity to note that nothing in prior judicial opinions precluded patent protection for computer programs; *Benson*'s claims were rejected because they pre-empted all use of the underlying mathematical formula and the involved algorithm.<sup>388</sup>

The court further held that the operating method at issue in *Chatfield* should be treated no differently from any other machine system.<sup>389</sup> It went on to uphold its ruling in *Bernhart* that a claim as a whole does not become nonstatutory merely because the point of patentability was

---

383. *Id.* at 147, 6 Computer L. Serv. Rep. (Callaghan) at 78.

384. *Id.* at 149, 6 Computer L. Serv. Rep. (Callaghan) at 81 (emphasis added). The dissent noted the "differing, conflicting interpretations with respect to whether [*Benson*] represents a general proscription on the patenting of computer programs under section 101" and concluded that it did represent such a proscription, arguing that the proscription applied even if the claims were drafted in apparatus form. *Id.* at 151, 6 Computer L. Serv. Rep. (Callaghan) at 85 (Lane, J., dissenting).

385. *Id.* at 149-50, 6 Computer L. Serv. Rep. (Callaghan) at 81-83.

386. *In re Chatfield*, 545 F.2d 152, 153, 6 Computer L. Serv. Rep. (Callaghan) 52, 53 (C.C.P.A. 1976), cert. denied, 434 U.S. 875 (1977).

387. *Id.* at 155, 6 Computer L. Serv. Rep. (Callaghan) at 56.

388. *Id.* at 155-56, 6 Computer L. Serv. Rep. (Callaghan) at 57.

389. *Id.* at 157, 6 Computer L. Serv. Rep. (Callaghan) at 60.

nonstatutory, *i.e.*, the novel claims lay in an equation.<sup>390</sup> In this context, the court distinguished *Christensen*, in which the invention merely gathered the data to solve an equation.<sup>391</sup> In *Chatfield*, the process did not end with the solution of a particular equation. Although mathematical algorithms appeared in the dependent claims, they were only used to carry out the independent claims or analysis steps. The only employment of the algorithms that would be pre-empted would be their use in the performance of the entire claimed method.<sup>392</sup> Moreover, the claims were limited to the operation of a computing machine system as specified.

Six months after *Chatfield* and *Noll*, the CCPA decided *In re Deutsch*.<sup>393</sup> The issue in that case was whether the method claimed read on nonstatutory subject matter, and again the CCPA reversed the PTO's refusal to grant a patent. The invention was a method to control and optimize the operation of a system of multi-unit manufacturing plants.<sup>394</sup> The Board found the point of novelty in the invention to be a formula or algorithm employed in the system and, following *Benson*, rejected the claims.<sup>395</sup> The CCPA held, however, that it was error to focus on the control means or optimization computing technique used by *Deutsch* because the whole invention lay in the "timing and sequencing of control application."<sup>396</sup> The disclosed computing technique and processing programs were alternative means to implement the optimization task. Thus, the processing programs were held to be even more incidental to the invention than those in *Chatfield*.<sup>397</sup> Even when used, the program algorithms of the *Deutsch* system would be freely available for any other purpose and thus not pre-empted. Furthermore, the court held that the invention was "in the technologically useful art of controlling and optimizing a system of manufacturing plants to a particular end use" and, therefore, constituted a statutory process.<sup>398</sup>

The *Deutsch* decision did not mean that the CCPA was reinstituting the technological arts doctrine as the decisive factor in its decisions. This became readily apparent when the court decided *In re Waldbaum*

---

390. *Id.* at 157-58, 6 Computer L. Serv. Rep. (Callaghan) at 60-62. The CCPA upheld the patentability of the invention in *Chatfield* by a three to two vote. The dissenters argued, however, that the end use of *Chatfield*'s invention was no more unlimited than the end use labeled "too broad" in *Benson*, in that both were methods carried out in data processing equipment. *Id.* at 161, 6 Computer L. Serv. Rep. (Callaghan) at 66-67 (Rich, J., dissenting).

391. *Id.* at 158, 6 Computer L. Serv. Rep. (Callaghan) at 62-63.

392. *Id.* at 158-59, 6 Computer L. Serv. Rep. (Callaghan) at 62-63.

393. 553 F.2d 689, 6 Computer L. Serv. Rep. (Callaghan) 408 (C.C.P.A. 1977).

394. *Id.* at 690, 6 Computer L. Serv. Rep. (Callaghan) at 409.

395. *Id.* at 691-92, 6 Computer L. Serv. Rep. (Callaghan) at 411-12.

396. *Id.* at 692, 6 Computer L. Serv. Rep. (Callaghan) at 413.

397. *Id.*

398. *Id.* at 693, 6 Computer L. Serv. Rep. (Callaghan) at 415.

*II*,<sup>399</sup> successor to *In re Waldbaum I*,<sup>400</sup> the holding of which the Patent Office had moved to vacate following the Supreme Court's decision in *Benson*.<sup>401</sup> In *Waldbaum I*, the CCPA had found that a method for controlling a data processor to calculate the relative number of O's (zeros) and I's (ones) in a date word constituted statutory subject matter<sup>402</sup> basing its holding on the theory that the method was in the technological arts.<sup>403</sup> Relying on *Benson*, the Patent Office Board of Appeals believed that the technological arts doctrine was insufficient to sustain patenting an invention that involved a procedure for solving a problem mathematical in nature.<sup>404</sup> In its first invalidation of a software invention since *Christensen*, the CCPA agreed that the decision in *Waldbaum I* should be vacated. The court stated that, as in *Benson*, the claims were "so abstract and sweeping as to cover both known and unknown uses," and the algorithm involved would be pre-empted if a monopoly were granted on its described use in the operation of data processing apparatus.<sup>405</sup> The court grouped *Waldbaum* with *Christensen*, arguing that the inventions in both cases were directed to a calculation of an algorithm; they were unlike *Deutsch* and *Chatfield*, in which the inventions were methods of operating a system or machines by employing algorithms.<sup>406</sup>

A week after *Waldbaum II*, the CCPA decided *In re Flook*.<sup>407</sup> The *Flook* invention involved a method for updating alarm limits of hydrocarbon conversions, "accomplished by some type of computer in accordance with a mathematical control equation."<sup>408</sup> Specifically, the process involved "an initial step which reads the parameters of the chemical process system, an intermediate step which uses an algorithm . . . , and a final step in which the actual alarm value is adjusted."<sup>409</sup> The Board rejected the claim because its only non-conventional feature was the algorithm, constituting nonstatutory subject matter.<sup>410</sup> The

399. 559 F.2d 611, 6 Computer L. Serv. Rep. (Callaghan) 415 (C.C.P.A. 1977).

400. 457 F.2d 997, 3 Computer L. Serv. Rep. (Callaghan) 173 (C.C.P.A. 1972), *vacated*, 559 F.2d 611, 6 Computer L. Serv. Rep. (Callaghan) 415 (C.C.P.A. 1977).

401. *In re Waldbaum II*, 559 F.2d 611, 615, 6 Computer L. Serv. Rep. (Callaghan) 415, 421 (C.C.P.A. 1977).

402. 457 F.2d 997, 1003, 6 Computer L. Serv. Rep. (Callaghan) 173, 181-82 (C.C.P.A. 1972), *vacated*, 559 F.2d 611, 6 Computer L. Serv. Rep. (Callaghan) 415 (C.C.P.A. 1977).

403. *In re Waldbaum II*, 559 F.2d 611, 615, 6 Computer L. Serv. Rep. (Callaghan) 415, 421 (C.C.P.A. 1977).

404. *Id.*

405. *Id.* at 616, 6 Computer L. Serv. Rep. (Callaghan) at 423 (quoting *Gottschalk v. Benson*, 409 U.S. 63, 64-68, 3 Computer L. Serv. Rep. (Callaghan) 256, 256-59 (1972)).

406. *Id.* at 617, 6 Computer L. Serv. Rep. (Callaghan) at 425.

407. 559 F.2d 21, 6 Computer L. Serv. Rep. (Callaghan) 426 (C.C.P.A. 1977), *rev'd sub nom.* *Parker v. Flook*, 437 U.S. 584, 6 Computer L. Serv. Rep. (Callaghan) 833 (1978).

408. *Id.* at 22, 6 Computer L. Serv. Rep. (Callaghan) at 427.

409. *Id.*

410. *Id.* at 22, 6 Computer L. Serv. Rep. (Callaghan) at 428.



CCPA reversed, holding "a claim to a process which *uses* an algorithm to modify a conventional manufacturing system is statutory subject matter,"<sup>411</sup> distinguishing the *Christensen* invention, which did nothing else after solving the algorithm.

*Christensen* recognized that the *absence* of a step other than those steps required for solution of the algorithm necessarily precludes the possibility that the claim involves statutory subject matter. . . . [A] claim must include a recitation which materially limits the claim to a scope less than the mere act of solving an algorithm. . . . [T]his requirement . . . may be satisfied by the recitation of some sort of post-solution activity.<sup>412</sup>

In *Flook*, the claims included, as a recitation of post-solution activity, "a step in which the solution is applied to a control system."<sup>413</sup> Mere solution of the algorithm would not infringe upon *Flook*'s claim; therefore, it was allowed.

The Supreme Court took its third excursion into the debate over software patentability when it reversed the CCPA's decision in *Flook*.<sup>414</sup> The Court noted that it had held in *Benson* that a mathematical formula may not be patented; in *Flook*, the question was "whether the identification of a limited category of useful, though conventional, post-solution applications of such a formula makes respondent's method eligible for patent protection."<sup>415</sup> The Court explained that *Flook*'s claim offered no new methods of selecting the variables that had to be plugged into the algorithm involved.

Responding to the CCPA's insistence that a patent claim must be considered as a whole, the Court agreed that the proper test was whether the process itself, not merely the mathematical algorithm, was new and useful.<sup>416</sup> Even so, the Court held:

Respondent's process is unpatentable under § 101 not because it contains a mathematical algorithm as one component, but because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention. Even though a phenomenon of nature or mathematical formula may be well known, an inventive application of the principle may be patented. Conversely, the discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application.<sup>417</sup>

411. *Id.* at 22-23, 6 Computer L. Serv. Rep. (Callaghan) at 429 (emphasis in original).

412. *Id.* at 23, 6 Computer L. Serv. Rep. (Callaghan) at 429 (emphasis in original).

413. *Id.*

414. *Parker v. Flook*, 437 U.S. 584, 6 Computer L. Serv. Rep. (Callaghan) 833 (1978).

415. *Id.* at 585, 6 Computer L. Serv. Rep. (Callaghan) at 834.

416. *Id.* at 591, 6 Computer L. Serv. Rep. (Callaghan) at 840 (citing *Funk Bros. Seed Co. v. Kalo Co.*, 333 U.S. 127, 130 (1948); *Mackay Radio & Tele. Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1938)).

417. *Id.* at 594, 6 Computer L. Serv. Rep. (Callaghan) at 842. The Court was actually

The fact that the method claim would not pre-empt every conceivable application of the formula was deemed insufficient, by itself, to support patentability.<sup>418</sup> The Court ended its opinion by observing that if patent protection for programs was desirable as a matter of policy and to promote the useful arts, Congress should take the lead.<sup>419</sup>

The CCPA's next opportunity to consider program patentability came in *In re Freeman*.<sup>420</sup> Freeman's invention was a "system for type-setting alpha-numeric information, using a computer-based control system in conjunction with a phototypesetter of conventional design."<sup>421</sup> Its advantage over the prior art came in its positioning of mathematical symbols in an expression.

The Board rejected the claims stating that their novelty resided only in the program, which involved use of an algorithm and which, if patented, would pre-empt the algorithm itself.<sup>422</sup> It further noted that the invention had no practical application except in connection with a digital computer. The CCPA resorted to its usual practice of distinguishing *Benson* and reversed the Board. According to the court, the claims in *Freeman* did not recite an algorithm in the *Benson* sense: "Because every process may be characterized as a 'step-by-step procedure . . . for accomplishing some end,' a refusal to recognize that *Benson* was concerned only with *mathematical* algorithms leads to the absurd view that the Court was reading the word 'process' out of the statute."<sup>423</sup> While mathematical algorithms may be expressed in many ways, such as in traditional mathematical symbols or in prose, Freeman's method claims did not recite steps that were calculations, formulas or equations. Thus, *Benson* should not have been called into play.<sup>424</sup>

---

assisted in overturning the CCPA decision by the CCPA's own words in *In re Richman*, 563 F.2d 1026, 6 Computer L. Serv. Rep. (Callaghan) 802 (C.C.P.A. 1977). In that case the CCPA had explained: "[I]f a claim is directed essentially to a method of calculating, using a mathematical formula, *even if the solution is for a specific purpose*, the claimed method is nonstatutory." *Id.* at 1030, 6 Computer L. Serv. Rep. (Callaghan) at 807 (emphasis added). See also *In re Castelet*, 562 F.2d 1236, 6 Computer L. Serv. Rep. (Callaghan) 787 (C.C.P.A. 1977).

418. 437 U.S. 584, 585, 6 Computer L. Serv. Rep. (Callaghan) 833, 835 (1978).

419. *Id.* at 595-96, 6 Computer L. Serv. Rep. (Callaghan) at 843.

420. 573 F.2d 1237, 6 Computer L. Serv. Rep. (Callaghan) 809 (C.C.P.A. 1978).

421. *Id.* at 1238, 6 Computer L. Serv. Rep. (Callaghan) at 809-10.

422. *Id.* at 1242-43, 6 Computer L. Serv. Rep. (Callaghan) at 816.

423. *Id.* at 1245-46, 6 Computer L. Serv. Rep. (Callaghan) at 821 (emphasis in original).

424. *Id.* at 1246-47, 6 Computer L. Serv. Rep. (Callaghan) at 822. In *Freeman*, the CCPA arrived at a two-step analysis for determining whether a claim pre-empts an algorithm and is therefore unpatentable. The court stated that the first inquiry is whether "the claim directly or indirectly recites an 'algorithm' in the *Benson* sense of that term." *Id.* at 1245, 6 Computer L. Serv. Rep. (Callaghan) at 820. If the answer to that inquiry is yes, then the court stated that the second step would be "further [analysis] to ascertain whether in its entirety [the claim] wholly preempts that algorithm." *Id.* If it does, then the algorithm is unpatentable. *Id.* Several subsequent cases have applied this two-tier *Freeman* test to determine

Not quite two months after its *Freeman* decision, the CCPA decided *In re Toma*.<sup>425</sup> Again, the CCPA reversed the Board's rejection of all the claims.<sup>426</sup> The invention was "a method of operating a digital computer to translate from a source natural language, e.g., Russian, to a target natural language, e.g., English."<sup>427</sup> The court relied on its reasoning in *Freeman* that unless claims directly or indirectly recite a *Benson*-type algorithm (a procedure for solving a given type of mathematical problem), they are not rendered nonstatutory by *Benson*.<sup>428</sup> The recited steps in *Toma* for translating between natural languages were not mere procedures for solving mathematical problems; thus, it was of no consequence that the algorithm involved was the only difference between the claimed method and the prior art computer translation method. Furthermore, translation by a computer clearly falls within the technological rather than the liberal arts. The "useful" arts inquiry must focus on "whether the claimed subject matter (a method of operating a machine to translate) is statutory, . . . not on whether the prior art which the claimed subject matter purports to replace (translation by human mind) is statutory."<sup>429</sup>

The most recent Supreme Court decision addressing the patentability of computer software is *Diamond v. Diehr*.<sup>430</sup> The *Diehr* invention involved a "process for molding raw, uncured synthetic rubber into cured precision products."<sup>431</sup> Diehr's invention would constantly measure the temperature inside the mold that formed the rubber products, and by feeding the temperature measurements into a computer that repeatedly recalculated the cure time by use of a mathematical formula, would signal a device to open the press at the proper time.<sup>432</sup> The Patent Office rejected Diehr's claims on the ground that, based upon *Benson*, they were drawn on nonstatutory subject matter.<sup>433</sup> The CCPA reversed, finding that an otherwise statutory claim is not rendered nonstatutory because a computer is involved.<sup>434</sup> The Supreme Court affirmed, holding Diehr's process claim to be an industrial pro-

---

whether a claimed process was an algorithm and, if so, whether the claim wholly pre-empted the algorithm. *E.g.*, *In re Sherwood*, 613 F.2d 809, 7 Computer L. Serv. Rep. (Callaghan) 675 (C.C.P.A. 1980), *cert. denied*, 450 U.S. 994 (1981); *In re Bradley*, 600 F.2d 807, 7 Computer L. Serv. Rep. (Callaghan) 591 (C.C.P.A. 1979), *aff'd per curiam*, 450 U.S. 381 (1981); *In re Philipp*, 608 F.2d 879, 7 Computer L. Serv. Rep. (Callaghan) 614 (C.C.P.A. 1979); *In re Johnson*, 589 F.2d 1070, 7 Computer L. Serv. Rep. (Callaghan) 541 (C.C.P.A. 1978).

425. 575 F.2d 872, 6 Computer L. Serv. Rep. (Callaghan) 824 (C.C.P.A. 1978).

426. *Id.* at 873-74, 6 Computer L. Serv. Rep. (Callaghan) at 825.

427. *Id.* at 874, 6 Computer L. Serv. Rep. (Callaghan) at 825.

428. *Id.* at 877, 6 Computer L. Serv. Rep. (Callaghan) at 832.

429. *Id.* at 877-78, 6 Computer L. Serv. Rep. (Callaghan) at 832.

430. 450 U.S. 175 (1981).

431. *Id.* at 177.

432. *Id.* at 178-79.

433. *Id.* at 179-80.

434. *Id.* at 181 (citing *In re Diehr*, 602 F.2d 982 (C.C.P.A. 1979)). The CCPA noted that Diehr's claims were directed neither to a mathematical algorithm nor to an

cess of the type that had been historically given patent protection.<sup>435</sup> The Court noted that Diehr's claim was not an attempt to patent a mathematical formula, prohibited by *Benson*, but was rather a process claim that implemented a mathematical formula and digital computer to achieve the desired result.<sup>436</sup> In conclusion, the Court stated that a process claim utilizing a mathematical formula and digital computer would not be rendered nonstatutory unless the claim were an attempt to patent the algorithm itself.<sup>437</sup>

### 3. Analysis

It is obvious from the above decisions that whether software in a particular case is patentable may depend upon the forum in which a final determination is made. Repeatedly reversed by the CCPA, the PTO appears nonetheless determined to abide by its broad interpretation of *Benson* and to look unfavorably upon patent applications for computer programs. A major objection is probably that accepting program patent applications might impose a severe burden on the Office's operations.<sup>438</sup> Because the PTO must compete with the private sector for the limited number of skilled employees, the office is likely to have insufficient personnel with the required expertise to determine whether software claims actually constitute novel, nonobvious departures from prior art. Additionally, the Patent Office lacks both an examination procedure and a file or system of classification of prior art from which to search and investigate new applications. In contrast, the CCPA seems firmly rooted in the belief that *Benson* is to be narrowly interpreted. Yet, even so, it will affirm PTO rejections in cases in which it is clear that the recitation of a *Benson*-type algorithm is the essence of the claim. Somewhere in between, the Supreme Court may be expected to continue its cautious approach to software patentability, favoring congressional initiative on the subject. The *Diamond v. Diehr*<sup>439</sup> decision, however, shows at least the beginning of action on the Court's part to keep faith with its earlier statements in dicta that computer software is not inherently unpatentable.

Despite the disagreement, some general observations can be made. It probably will be irrelevant whether software claims are drafted as apparatus or method claims because the PTO and CCPA appear unwilling to allow an applicant to accomplish indirectly what he could

---

improved method of calculation, but to a process for molding rubber articles by solving a practical problem that had arisen in the industry. *Id.*

435. *Id.* at 184.

436. *Id.* at 187.

437. *Id.* at 191-93. The Court found that Diehr's claim was not an attempt to patent the algorithm involved, but only to patent the industrial process; therefore, the Court allowed the claim. *Id.*

438. See *In re Chatfield*, 545 F.2d 152, 159, 6 Computer L. Serv. Rep. (Callaghan) 52, 68 (C.C.P.A. 1976) (Rich, J., dissenting).

439. 450 U.S. 175 (1981).

not claim directly. Nevertheless, method claims should be tied to at least one appropriate device or structure, such as a general purpose digital computer. It will probably be unnecessary to describe the structure in great detail if it is a part of the prior art or to describe the structure as transformed by the program. However, the disclosure of a programming claim should still include a program listing.

Most, if not all, process claims will recite an algorithm. If the only novel point of a claim is its non-mathematical algorithm, it will be statutory subject matter and patentable as long as it satisfies the other statutory requirements, such as usefulness and nonobviousness. If, however, the invention claim recites a *Benson*-type algorithm, it will also need to specifically recite a novel and practical end use so that the patent sought will not totally pre-empt all practical application of the algorithm. Regardless of post-solution activity, a claim reciting a mathematical algorithm with no other novel point will not constitute statutory subject matter. Finally, to be patented the invention must not be obvious, in light of prior art, to those reasonably skilled in the art of programming.

The obviousness factor may continue to be a major stumbling block to program patentability. Although the Supreme Court in *Johnston* found no basis for applying *Graham's* secondary indicia of nonobviousness (others having attempted and failed to accomplish the same result), it did not reject that test.<sup>440</sup> Many software inventors will probably need to rely on such circumstantial evidence.

In the context of computer programming, the use of circumstantial indicia of nonobviousness may be crucial in some instances. When presented with the esoteric technology present in the computer software industry, the factual distinctions produced by the *Graham* analysis do not necessarily lend themselves to a clear resolution of the nonobviousness issue. In practice, the only way for courts to meaningfully resolve the section 103 issue may be to place increased emphasis on the probative value of circumstantial evidence . . .<sup>441</sup>

440. *Dann v. Johnston*, 425 U.S. 219, 226 (1976). A sign that the courts may favorably use the *Graham* secondary criteria can be found in the Ninth Circuit's decision in *Reeves Instrument Corp. v. Beckman Instruments, Inc.*, 444 F.2d 263, 3 Computer L. Serv. Rep. (Callaghan) 693 (9th Cir. 1971). The court in that case stated, "When the evidence shows that several others in the art have attempted to solve the same problem and have not arrived at the solution claimed by the patent in suit, the statutory presumption of validity is substantially strengthened." *Id.* at 272, 3 Computer L. Serv. Rep. (Callaghan) at 706. Noting earlier industry attempts and failures, the court held that the plaintiff's patented method for checking an analog computer was not obvious in light of the prior art. *Id.* at 272, 3 Computer L. Serv. Rep. (Callaghan) at 707-08.

441. Comment, *Patentability of Computer Software: The Nonobviousness Issue*, 62 IOWA L. REV. 615, 630 (1976). The writer notes further that reliance on the *Graham* criteria may be the "best way to achieve a rational disposition of the unique legal problems presented by the highly sophisticated computer industry and at the same

If it were recognized that the purpose of the patent system is the promotion of the "useful arts," it would be clear that the question of whether a process is statutory should be determined largely in light of its actual contribution to technological progress. In other words, inventions that in fact promote the useful arts should not be discriminated against by court-created barriers to patentability. This type of discrimination would be eliminated by a pure application of the "technological arts" doctrine, unaffected by the fact that a claimed process might contain mental steps. The "technological arts" doctrine clearly encompasses computer programs because a program is a process that is useful in the internal operation of a computer and, as such, within the useful or technological arts.

Resolution of the question of software patentability is not likely to come until congressional action is taken. If Congress does act, it is likely to at least consider proposals that an alternative form of protection be created for the unique and complex technology of computer software. Congress is constitutionally authorized to promote the useful arts by extending protection to inventors and their discoveries, but it is not mandatory that such safeguards be in the form of traditional patent protection.<sup>442</sup>

## V. CONCLUSION

The need for proprietary protection of software products is obvious from the competitive nature of the industry and the growing number of articles and decisions published on the subject. As with any new technological advancement, however, judicial and legislative bodies are slow in adapting the law to meet the needs of software manufacturers. Nevertheless, on both state and federal levels, software manufacturers are experiencing increasing success in recovering for misappropriation of the products they have expended exorbitant amounts of time and money developing. Despite this encouraging fact, proprietors should be aware of the possible impediments to legally safeguarding their products and take independent action to prevent the piracy of others.

---

time to maintain the constitutional objectives effectuated by the Patent Act." *Id.* at 635.

Interestingly, no question relating to obviousness was ever raised in *Benson*, despite the fact that "often when a programmer may wish to convey data from one format to the other . . . he will devise a series of instructions which are the logical equivalent of the set which Benson tried to patent." See Note, *Computer Software: Beyond the Limits of Existing Proprietary Protection Policy*, 40 BROOKLYN L. REV. 116, 135 (1973).

442. Note, *Computer Software: Beyond the Limits of Existing Proprietary Protection Policy*, 40 BROOKLYN L. REV. 116, 143 (1973). "There is nothing sacred about the dual American scheme of proprietary protection as it exists today." *Id.*