

1977

Intellectual Property Protection for Computer Programs: Are Patents Now Obtainable?

Robert J. Gaybrick

Follow this and additional works at: <https://scholarship.law.edu/lawreview>

Recommended Citation

Robert J. Gaybrick, *Intellectual Property Protection for Computer Programs: Are Patents Now Obtainable?*, 26 Cath. U. L. Rev. 835 (1977).

Available at: <https://scholarship.law.edu/lawreview/vol26/iss4/7>

This Notes is brought to you for free and open access by CUA Law Scholarship Repository. It has been accepted for inclusion in Catholic University Law Review by an authorized editor of CUA Law Scholarship Repository. For more information, please contact edinger@law.edu.

INTELLECTUAL PROPERTY PROTECTION FOR COMPUTER PROGRAMS: ARE PATENTS NOW OBTAINABLE?

The proper form of intellectual property protection to be given computer software¹ has been the subject of frequent judicial and administrative inquiry as the computer industry has grown during the past quarter century.² Protection of the software developer's investment, public access to the developed software, and technological progress within the computer industry have long been recognized as the theoretical goals of any scheme of software protection under the law. Nevertheless, there has been substantial disagreement as to the proper means to accomplish these agreed upon ends.³ The extent to which computer software can be protected under the intellectual property concepts of trade secret law and the law of copyrights is known,⁴ the unresolved question is the scope of computer software protection under the patent laws.

Trade secret law, the copyright laws, and the patent laws require differing degrees of novelty⁵ and compliance with certain procedures before prop-

1. A computing system is generally considered to have two basic types of components: "hardware" and "software." Hardware refers to the physical architecture of the computer; software refers to both the computer programs and the instructions which control the functions of the hardware. See generally *Computer Programs: Should They Be Patentable?*, 68 COLUM. L. REV. 241 (1968).

2. See, e.g., *Dann v. Johnston*, 425 U.S. 219 (1976); *Gottschalk v. Benson*, 409 U.S. 63 (1972); *In re Waldbaum*, 457 F.2d 997 (C.C.P.A. 1972); *In re Musgrave*, 431 F.2d 882 (C.C.P.A. 1970); *In re Bernhart*, 417 F.2d 1395 (C.C.P.A. 1969); *In re Prater*, 415 F.2d 1378 (C.C.P.A. 1968), *aff'd in part and rev'd in part*, 415 F.2d 1393 (C.C.P.A. 1969); *Guidelines to Examination of Applications for Patents on Computer Programs*, 855 OFFICIAL GAZETTE OF THE U.S. PAT. OFF. 829 (1968); REPORT OF THE PRESIDENT'S COMMISSION ON THE PATENT SYSTEM (1966), reprinted in S. Doc. No. 5, 90th Cong., 1st Sess. 13 (1967).

3. See 68 COLUM. L. REV. 241, *supra* note 1; Comment, *Computer Program Protection: The Need to Legislate a Solution*, 54 CORNELL L. REV. 586 (1969); Comment, *Computer Program Classification: A Limitation on Program Patentability as a Process*, 53 ORE. L. REV. 501 (1974); Note, *Protecting Proprietary Rights of Computer Programs: The Need for New Legislative Protection*, 21 CATH. U.L. REV. 181 (1971); Note, *Protection of Computer Programs: Resurrection of the Standard*, 50 NOTRE DAME LAW. 333 (1974).

4. See 54 CORNELL L. REV., *supra* note 3, at 589-90.

5. For a discussion of the novelty requirement in trade secret law, see R. MILGRIM, TRADE SECRETS § 2.08 (11th ed. 1977). The novelty requirements under the copyright

erty will be given protection against wrongful appropriation or infringement. The patent statutes also mandate that the property or invention possess the attributes of one of a limited number of classes of patentable subject matter. If the invention is a "new and useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof," then the invention may be patented subject to the other requirements of the statute.⁶ If, however, the invention is a method of doing business,⁷ an algorithm,⁸ a mere idea,⁹ or a discovery of a phenomenon of nature,¹⁰ it is not properly a subject for patent protection.¹¹

The requirement that a patentable invention be within a statutory classification forms the basis of a continuing dispute over the patentability of inventions in computer software, or, as they are more commonly known, computer programs. Computers themselves are patentable as "machines." Since they represent the use of a computer to perform a specified function or solve a problem, computer programs are, however, not so easily characterized as patentable subject matter, such as a process or a machine. Programs have been considered to fall under the categories of algorithm, method of doing business, or other unpatentable subject matter.¹² The often differing opinions of the courts, Patent and Trademark Office (PTO) officials, and patent

and patent statutes are set forth at 17 U.S.C.A. § 102 (Supp. App. 1977) and 35 U.S.C. §§ 102-03 (1970 & Supp.) respectively.

6. The classes of statutory subject matter are set forth in 35 U.S.C. § 101 (1970): "Whoever 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 this title."

7. *Hotel Security Checking Co. v. Lorraine Co.*, 160 F. 467, 469 (2d Cir. 1908) (hotel bookkeeping and registration system not limited to any particular method or apparatus held unpatentable).

8. *Guthrie v. Curlett*, 10 F.2d 725, 726 (2d Cir. 1926) (valid patent cannot issue if no patentable means are disclosed for implementing the new idea).

9. *Gottschalk v. Benson*, 409 U.S. 63, 71 (1972); *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874).

10. *O'Reilly v. Morse*, 56 U.S. 62, 120 (1853) (claim to the effects of the use of magnetism held invalid).

11. For a discussion of non-statutory subject matter, see 1 A. DELLER, *DELLER'S WALKER ON PATENTS* § 22 (2d ed. 1964).

12. The term "program" is defined alternatively in C.J. SIPPL & C.P. SIPPL, *COMPUTER DICTIONARY AND HANDBOOK* 339 (2d ed. 1972) as:

1. A plan for the automatic solution of a problem. A complete program includes plans for the transcription of data, coding for the computer, and plans for the absorption of the result into the system. The list of coded instructions is called a routine.
2. A set of instructions or steps that tells the computer exactly how to handle a complete problem—payroll, production scheduling, or other applications.

applicants as to what constitutes a patentable computer program have resulted in frequent litigation and many unresolved questions.

The Court of Customs and Patent Appeals (CCPA) in the recent decision of *In re Chatfield*¹³ has rekindled optimism in the theory that patent protection is appropriate for computer software inventions. The court laid to rest the notion that inventions are unpatentable merely because they are most advantageously embodied in a computer program. The inventive use of a computer was recognized as a field of technology legitimately promoted by the patent system.¹⁴

The court in *Chatfield* addressed the patentability of an invention in which the preferred embodiment was a computer program. The PTO Board of Appeals had held the invention unpatentable because it was directed to computer software and was *ipso facto* nonstatutory subject matter.¹⁵ The CCPA refused to adopt such a broad rule and indicated that the issue of patentability in this and similar cases could be resolved only by subjecting the claimed invention as a whole to the tests of patentability.¹⁶ Viewed in this light, a majority of the court found for the applicant and held that it is no bar to patentability that an invention is most advantageously implemented by means of a computer program.¹⁷ In *Chatfield*, the CCPA merged their knowledge of computer technology with their expertise in patent law to formulate standards to aid PTO officials in identifying statutory subject matter in the computer software context.¹⁸

13. 545 F.2d 152 (C.C.P.A. 1976), *cert. denied*, 46 U.S.L.W. 3181 (U.S. Oct. 4, 1977).

14. The constitutional basis for the patent system is found in U.S. CONST. art. I, § 8, cl. 8: "The Congress shall have power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

15. 545 F.2d at 155.

16. *Id.* at 157.

17. *Id.* at 158-59.

18. On the same day that *Chatfield* was announced, the CCPA decided the case of *In re Noll*, 545 F.2d 141 (C.C.P.A. 1976), *cert. denied*, 46 U.S.L.W. 3181 (U.S. Oct. 4, 1977). The claims in *Noll* involved a programmed computer-controlled apparatus for displaying characters and graphical information on a cathode ray tube. The PTO Board of Appeals rejected the claims as a non-statutory apparatus and, in effect, an attempt to obtain a patent on the program for controlling the apparatus. *Id.* at 147-49. The CCPA reversed. The timing of the decisions in *Noll* and *Chatfield* appear to indicate a deliberate choice by the CCPA to issue holdings in a process and an apparatus case relating to computer programs. See *COMPUTERWORLD*, Jan. 3, 1977, at 14, col. 3. On July 5, 1977 Bell Telephone Laboratories, Inc., the assignee of the *Noll* patent application, filed an express abandonment of the application. On July 7, 1977 Bell filed a memorandum which requested that the judgment below be vacated and the case remanded to the C.C.P.A. for dismissal. Memorandum of Respondent suggesting the cause is moot (U.S. July 7, 1977) (No. 76-1558). Thus, although the CCPA's decision

This article will examine the scope of protection for computer software inventions afforded under the intellectual property concepts of trade secret law and copyright law, and consider the ramifications of the *Chatfield* decision on the field of patent protection for this type of invention.

I. COMPUTER SOFTWARE PROTECTION UNDER TRADE SECRET AND COPYRIGHT LAW

Both state common law and statutory law afford protection for trade secrets.¹⁹ This protection originally evolved from the law of unfair competition,²⁰ and it now embraces processes, machines, or compilations of information which provide the owner with advantages over competitors who neither know nor use the object of the trade secret.²¹ To qualify as a trade secret, the process, machine, or compilation of information must not be commonly known.²² Trade secret protection can extend to subject matter excluded from patent protection either for lack of patentable novelty or failure to be statutory subject matter under the patent laws.²³ Therefore, an owner of a computer software invention can protect his investment in unpatentable computer software by meeting the minimal trade secret requirements. A trade secret can be kept secret by the owner or disclosed to others such as licensees who in turn must be required to maintain the secret.²⁴ Furthermore, trade secret law protects the owner in perpetuity from any fraudulent misappropriation²⁵ and this relatively extensive protection has induced large capital investments in software inventions.

There are disadvantages to both the owner and the public, however, in the use of trade secret protection. The scope of protection is limited since the owner is unprotected from subsequent independent discovery by another, discovery of the secret by reverse engineering,²⁶ or public discovery by acci-

in *Noll* indicated that apparatus claims relating to computer programs could be patentable, the *Noll* decision is now of little significance since it will most likely be vacated.

19. See MILGRIM, *supra* note 5, §§ 1.09, 1.10. App. § 2.01(1) sets forth the Uniform Trade Secrets Protection Act proposed by the ABA Patent, Trademark and Copyright Law Section in 1971.

20. D. Bender, *Trade Secret Protection of Software*, 38 GEO. WASH. L. REV. 909, 930-31 (1970).

21. See MILGRIM, *supra* note 5, § 2.01.

22. *Id.* §§ 2.03, 2.07.

23. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974) (state trade secret protection is not preempted by federal patent law).

24. See MILGRIM, *supra* note 5, § 3.05(5).

25. See 21 CATH. U.L. REV., *supra* note 3, at 195.

26. The term "reverse engineering" refers to discovering the secret materials, features or processes employed in producing the product by lawfully acquiring the product and then disassembling it into its component parts.

dental or mistaken disclosure.²⁷ Thus there is the risk that the owner will lose exclusive rights in the secret property.²⁸ Also, there is judicial hostility to recognizing a monopoly, albeit not a patent monopoly, for an invention which fails to rise to the standards of patentability.

In addition to the disadvantages to the owner, a serious public detriment inheres in the nondisclosure of a trade secret. The requirement of an enabling disclosure of a patented invention serves to increase the technological knowledge possessed by the general public by providing access to the disclosed technology and thereby giving incentive to other inventors to invent around the issued patent and accomplish the same result by noninfringing means.²⁹ Moreover, a patented invention becomes available for the use of the general public after the passage of the specified statutory monopoly, whereas trade secret protection may last forever. Since trade secret protection by definition permits no such public disclosure, there is no increase in knowledge, and duplication of effort and expense can frequently result from multiple inventors simultaneously working in the same area of technology in secret.

A viable alternative to trade secret or patent protection for the owner of a computer software invention is the Copyright Act.³⁰ Copyright protection presents advantages over other forms of intellectual property protection. To qualify, one must merely establish authenticity of authorship and originality of expression and fulfill minimal procedural requirements, such as publication of the work with a notice of ownership.³¹ Copyrights are inexpensive to obtain, may be registered in a short time period, and are effective for the term of the life of the copyright holder plus 50 years.³² Additionally, a holder is entitled to recover statutory damages from an infringer without a showing of actual damage.³³

Copyright protection, however, extends only to the form of the expression

27. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 476 (1974).

28. *Id.* at 482.

29. *Cf. id.* at 481.

30. Copyright Act of 1976, Pub. L. No. 94-533, 90 Stat. 2541 (1976) (to be codified in 17 U.S.C. §§ 101 *et seq.*).

31. The Copyright Office in 1964 gave public notice that it would accept computer software or programs for registration. *See* U.S. Copyright Office, Announcement SML-47 (May 19, 1964). The conditions for registration set forth in this Announcement included: (1) the computer program must be original, (2) it must have been published in printed form, and (3) the copies deposited for registration must include reproductions of the work in human language form as opposed to machine language form.

32. *See* Copyright Act of 1976, Pub. L. No. 94-533, 90 Stat. 2541 (1976) (to be codified in 17 U.S.C. §§ 101 *et seq.*).

33. *Id.* § 504.

and not to any underlying ideas.³⁴ Therefore, the inventive concepts underlying a copyrighted computer program can be appropriated with impunity as long as the structure or coding of the work is not knowingly duplicated. The owner of a software invention may find this limitation intolerable since the cost of the actual expression, the program listing to be registered, is most likely incidental to the overall expense of conceiving and implementing an inventive use of a computer. Copyright protection is further limited because a holder has no rights against one who independently duplicates the copyrighted work.

Another disadvantage to using the copyright in this situation is that despite public dissemination of a copyrighted work, the public may still be unaware of the nature and significance of the invention disclosed. Obtaining a copy of a program listing does not insure that the underlying invention can be successfully implemented or that alternative noninfringing methods for practicing the invention will become apparent to others. Thus, any increase in technological information and expertise available to the public may be insignificant.³⁵

II. PATENT PROTECTION

The patent system is premised on the quid pro quo exchange of a limited term monopoly granted to the patentee for public disclosure of the invention. The invention must encompass statutory subject matter,³⁶ be novel,³⁷ nonobvious in view of the existing state of the art in the field of the invention,³⁸ and be sufficiently disclosed to enable one skilled in the subject matter of the invention to practice the invention.³⁹ A patent endows the owner with the right to exclude all others from making, using, or vending the patented invention for seventeen years.⁴⁰ Patent protection is enhanced under the doctrine of equivalents which broadens the scope of the monopoly to include inventions consisting of slightly different elements.⁴¹ The right to exclude

34. The Supreme Court in *Mazer v. Stein*, 347 U.S. 201 (1954) drew a distinction between copyright and patent protection when it stated: "Unlike a patent, a copyright gives no exclusive right to the art disclosed; protection is given only to the expression of the idea—not the idea itself." *Id.* at 217.

35. For a discussion of the advantages and disadvantages of both copyright and trade secret protection, see generally 68 COLUM. L. REV., *supra* note 1; 21 CATH. U.L. REV., *supra* note 3; 54 CORNELL L. REV., *supra* note 3.

36. 35 U.S.C. § 101 (1970).

37. *Id.* § 102.

38. *Id.* § 103.

39. *Id.* § 112.

40. *Id.* § 154.

41. 35 U.S.C. § 112 (1970) states:

and the ability to protect more than the mere expression of an invention are strong incentives for seeking protection under the patent laws.

To specify the scope of the patent monopoly, the invention disclosure must include one or more claims which define the invention.⁴² The claimed invention may encompass multiple embodiments not all of which would necessarily fall within one of the classes of patentable subject matter set forth in section 101 of the patent laws.⁴³ Patent applications involving computer software inventions have most commonly been claimed as either a machine or a process.⁴⁴ The theory underlying machine claims, commonly referred to as apparatus claims, is that the combination of a general purpose digital computer and a computer program results in a new, special purpose apparatus with the capability of performing the objects of the program.⁴⁵

On the other hand, a "process" within the patent law was defined by the Supreme Court in *Cochrane v. Deener*⁴⁶ as "a mode of treatment of certain materials to produce a given result. It is an act, or series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing."⁴⁷ A program claimed as an inventive process sets forth sequential steps performable by a computer to manipulate and transform a predefined set of inputs and variables to produce given results. A computer program which is claimed as a process affords a broad patent monopoly, as does any process claim, since the process need not be tied to any particular appara-

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and *equivalents* thereof. (emphasis added)

The doctrine of equivalents expands the scope of the patent monopoly defined in the claims by viewing as a matter of law the recited elements in the claim to include all reasonable substitutes therefor. Thus a patentee who claims an element A will still have rights against one who substitutes element B for element A if the claimed combination with element B operates in substantially the same way in performing a substantially identical function to obtain a substantially similar result. See *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 41-43 (1929) and *Machine Co. v. Murphy*, 97 U.S. 120, 125-26 (1877) for pre-codification holdings on the doctrine of equivalents.

42. See 35 U.S.C. § 112 (1970). "Claims tell what the invention is; they define it. They are statutory requirements, prescribed for the purpose of making an inventor define precisely what his invention comprises. Their function is not to add knowledge; it is to define the scope of a patent grant." 5 A. DELLER, *DELLER'S WALKER ON PATENTS* § 445 (2d ed. 1972) (footnotes omitted).

43. See 35 U.S.C. § 101 (1970).

44. See note 6 *supra* for the statutory basis for such claims.

45. See *In re Bernhart*, 417 F.2d 1395, 1400 (C.C.P.A. 1969); *In re Prater*, 415 F.2d 1393, 1403 n.29 (C.C.P.A. 1969).

46. 94 U.S. 780 (1876).

47. *Id.* at 788.

tus.⁴⁸ Infringement of a process claim is not avoided by merely reversing the order of the process steps,⁴⁹ employing the process to solve a different problem,⁵⁰ or by adding steps to the process as claimed.⁵¹

It was the early administrative policy of the PTO, however, that computer programs claimed as either an apparatus or a process were unpatentable.⁵² Uncertainty as to the statutory nature of computer programs, satisfactory creation of computer programs absent patent protection, and manpower and facility limitations in the Patent Office were cited to support this policy.⁵³ This announced predisposition against patenting computer programs did not completely deter inventors from applying for patents on their software inventions. Initial attempts to obtain process patent protection for computer programs were rejected by the PTO as nonstatutory subject matter under the mental steps doctrine. This doctrine, established in the noncomputer case of *In re Abrams*,⁵⁴ consists of a three-pronged test: (1) a method or process claim in which all the steps are purely mental is not patentable, (2) a method claim including both mental and physical steps is also not patentable if the claimed novelty resides in the purely mental steps, and (3) a method claim including both mental and physical steps is patentable if the point of novelty resides in steps not purely mental and the mental steps are incidental to the process.⁵⁵ The CCPA finally encountered a PTO mental steps rejection in the computer-related case of *In re Prater*.⁵⁶ In *Prater*, the court restricted the mental steps doctrine and held that the so-called "rules" of *Abrams* were inapplicable to a particular process invention which was most advantageously practiced by a computer program.⁵⁷ The invention as defined by the claims was found to be within the industrial arts, to require no

48. See *Waxham v. Smith*, 294 U.S. 20, 23 (1935); *Tilghman v. Proctor*, 102 U.S. 707, 730 (1881).

49. See *Aurora Mantel & Lamp Co. v. Kaufmann*, 243 F. 911, 916 (7th Cir. 1917).

50. *United States Mitis Co. v. Midvale Steel Co.*, 135 F. 103, 112 (E.D. Pa. 1904).

51. *Miami Copper Co. v. Minerals Separation Ltd.*, 244 F. 752, 768 (3d Cir. 1917).

52. *Patent Office Examination of Patent Applications on Computer Programs, Notice of Issuance of Guidelines*, 33 Fed. Reg. 15609-10 (1968).

53. REPORT OF THE PRESIDENT'S COMMISSION, *supra* note 2, at 21. The report recommended that computer programs claimed either as an apparatus or as a method be declared unpatentable as nonstatutory subject matter. See 68 COLUM. L. REV. 241, *supra* note 1, at 241 n.5.

54. 188 F.2d 165 (C.C.P.A. 1951).

55. These rules were proposed in the brief for appellant/applicant. *Id.* at 166.

56. 415 F.2d 1378 (C.C.P.A. 1968), *aff'd in part & rev'd in part*, 415 F.2d 1393 (C.C.P.A. 1969).

57. In distinguishing *Abrams* the court noted: "[I]n *Abrams*, unlike the present situation the claimed process could *only* be performed in the mind The *Abrams* situation may thus be distinguished from that presently before us, in which there is adequate disclosure how the process can be performed without mental calculation." 415 F.2d at 1389; *see id.* at 1402.

human mental activity, and thus was patentable.⁵⁸ The court reaffirmed this distinction in the process program case of *In re Bernhart*,⁵⁹ noting the differing capacities of the computer and the human mind, and thereby further limiting the scope of the mental steps exception.⁶⁰ Finally, in *In re Musgrave*⁶¹ the court disaffirmed any support for the mental steps doctrine noting that all that is necessary to deem "a sequence of operational steps a statutory 'process' . . . is that it be in the technological arts so as to be in consonance with the Constitutional purpose to promote the progress of the 'useful arts.'"⁶² Thus the mental steps exclusion had evolved from the three-pronged *Abrams* test to an ephemeral requirement that the process as claimed be native to technological arts, as opposed to liberal or fine arts.

Frequently the cases developing the law governing process patents for computer programs also contained apparatus claims. In the rehearing of *In re Prater*,⁶³ the court noted that "[i]n one sense, a general-purpose digital computer may be regarded as but a storeroom of parts and/or electrical components."⁶⁴ The introduction of a program into the computer was considered, in effect, an assembling of these parts into a previously non-existent special purpose apparatus. The court felt that no human with pencil and paper could, through mental processes, be the equivalent of such an apparatus, and, therefore, the mental steps doctrine could not be applied to re-

58. *Id.* at 1389. The court stated that "patent protection . . . is not precluded by the mere fact that the process could alternatively be carried out by mental steps." *Id.* This marks a significant departure from the *Abrams* ruling that if the invention resided in a purely mental step the invention is nonstatutory.

59. 417 F.2d 1395 (C.C.P.A. 1969).

60. The court noted that a mental steps rejection does not apply where a programmed computer is claimed in such a manner as not to be equivalent to the human mind. *Id.* at 1399. A representative claim was for:

A plotting method . . . comprising:

- (a) a first step of programming the computer to compute the position of planar Cartesian coordinate axes in the given plane relative to the given set of object points,
- (b) a second step of programming the computer to compute and produce an output defining in sequence the coordinates of the projection of each given point on the plane with reference to the Cartesian coordinate axes, and
- (c) the step of applying the computer output to the input of a planar plotting apparatus adapted to provide on a plane a succession of straightline segments that connect between sequential points having positions corresponding to the coordinates computed by the second step.

Id. at 1397.

61. 431 F.2d 882 (C.C.P.A. 1970).

62. *Id.* at 893.

63. 415 F.2d 1393 (C.C.P.A. 1969).

64. *Id.* at 1403 n.29.

ject a computer-related invention claimed as an apparatus and embodied in a computer program. This concept was affirmed in *In re Bernhart*⁶⁵ where the CCPA held that claims defining such a special purpose apparatus were statutory subject matter and had to be examined for patentability in view of existing prior art.⁶⁶ After *Prater* and *Bernhart* the CCPA had apparently made it clear that apparatus claims reciting a combination of a digital computer and a computer program were not inherently nonstatutory and were not to be rejected under the mental steps doctrine. Patentability of such machines was to be measured against the traditional standards of novelty⁶⁷ and nonobviousness in view of the prior art.⁶⁸

III. *Benson* AND *Johnston*: THE SUPREME COURT DECISIONS

In *Gottschalk v. Benson*,⁶⁹ the Supreme Court addressed the issue of patentability of computer programs and, specifically, whether such inventions are a "process" within the meaning of the patent law. The applicants in *Benson* presented process claims covering a method of converting binary coded decimal numbers (BCD) to pure binary numbers.⁷⁰ This conversion is closely aligned with any practical application of a general purpose digital computer because of the constant need to interface the decimal number system used by humans with the binary number system employed internally by a computer. The invention was embodied as an algorithmic computer pro-

65. 417 F.2d at 1401.

66. *Id.* at 1399-400. The court responded to a PTO argument that a programmed digital computer is not a new machine because the apparatus has not changed by stating that the programmed computer "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." *Id.* at 1400.

67. 35 U.S.C. § 102 (1970).

68. 35 U.S.C. § 103 (1970).

69. 409 U.S. 63 (1972).

70. Claim 8 of the *Benson* patent application reads:

The method of converting signals from binary coded decimal form into binary which comprises the steps of:

- (1) storing the binary coded decimal signals in a reentrant shift register,
- (2) shifting the signals to the right by at least three places, until there is a binary '1' in the second position of said register,
- (3) masking out said binary '1' in said second position of said register,
- (4) adding a binary '1' to the first position of said register,
- (5) shifting the signals to the left by two positions,
- (6) adding a '1' to said first position, and
- (7) shifting the signals to the right by at least three positions in preparation for a succeeding binary '1' in the second position of said register.

Id. at 73-4.

gram or subprogram executed automatically within the computer without any human intervention. The CCPA had reversed a PTO Board of Appeals' mental steps rejection and established patentability.⁷¹ The court was careful to note that the particular invention at issue departed significantly from prior process claims because the process was "directed solely to the art of data-processing itself whereas in most [others] some subsidiary or additional art was involved."⁷²

The Supreme Court reversed the CCPA and found the claims unpatentable. Justice Douglas, writing for the Court, found the claims impermissibly abstract and sweeping in scope since they were without any limitations as to the apparatus for performing the process or the technology or end use to which the process was to be applied.⁷³ The opinion cites prior case law relating to apparatus claims for noncomputer applications to support the principle that abstract intellectual concepts are unpatentable unless they are grounded in some novel and concrete application.⁷⁴ Citing the definition of a patentable process set forth in *Cochrane v. Deener*,⁷⁵ the Court stated that the sine qua non of patentability of a process claim was the "transformation and reduction of an article 'to a different state or thing'" and found no such transformation inherent in the claimed process.⁷⁶ The *Benson* invention was classified as a mathematical formula. Therefore, since it had no practical application except with a general purpose digital computer and would, if patented, preempt any use of the mathematical formula by anyone other than the patentee, it was as unpatentable as any pure algorithm would be.

While ruling that the *Benson* claim caused no apparent transformation of an article to a new thing and would have effectively preempted any independent application of the process, the Court refrained from holding that no program claimed as a process could be patented or that the decision was to be construed as precluding the patenting of any program/computer combination.⁷⁷ The Court apparently considered itself unequipped to formulate such

71. 441 F.2d 682 (C.C.P.A. 1971).

72. *Id.* at 686.

73. 409 U.S. at 67-68.

74. *Id.* at 68.

75. 94 U.S. 780 (1877).

76. 409 U.S. at 69-70. The Court apparently felt that the requisite transformation could not be inferred since it made no attempt to explain why the transformation of BCD to pure binary does not satisfy the requirement. This is a curious omission, since, as the CCPA had noted, the mere fact that the transformation occurs internally within the computer and is not observable by the human eye should not result in a denial of its occurrence. See note 66 *supra*.

77. The Court stated: "It is said that the decision precludes a patent for any program servicing a computer. We do not so hold." 409 U.S. at 71. This language when

a sweeping policy and it called upon Congress to resolve the issue of patentability of computer programs.⁷⁸

In a subsequent case, the CCPA construed the *Benson* holding narrowly, seeing it as a rejection only of claims to computer implemented algorithms that are not limited to any specific technology or end use.⁷⁹ The Supreme Court appeared to confirm this interpretation in dicta in *Dann v. Johnston*⁸⁰ by characterizing its *Benson* holding as limited. The *Johnston* claims were ultimately held unpatentable without further discussion of what types of programs, if any, are statutory subject matter.⁸¹

IV. THE *Chatfield* DECISION

In *In re Chatfield*⁸² the claimant appealed a PTO Board of Appeals decision that his claims for a process dynamically reallocating the priorities of a computer system's processing resources were drawn to a subject matter deemed nonstatutory in *Benson*. *Chatfield's* invention, as characterized by the CCPA, comprised a "novel solution [which] dynamically evaluates and

considered with other statements in the opinion has aroused controversy as to the actual scope of the holding in *Benson*. For a more detailed analysis of the *Benson* decision see Sher, *Comment: Comm. of Patents v. Benson et al.*, 56 J. PAT. OFF. SOC'Y 179 (1974); Note, *Gottschalk v. Benson: A Bright Light With A Dim Future*, 28 BAYLOR L. REV. 187 (1976).

78. "If these programs are to be patentable, considerable problems are raised which only committees of Congress can manage, for broad powers of investigation are needed, including hearings which canvass the wide variety of views which those operating in this field entertain." 409 U.S. at 73.

79. *In re Christensen*, 478 F.2d 1392 (C.C.P.A. 1973). The *Christensen* applicant appealed from a Board of Appeals' rejection of his process claims for a computer implemented method of determining the porosity of subsurface formations. The Board had held *Christensen's* claims to be nonstatutory because they recited a mathematical formula at the point of novelty and because the method would be commercially embodied as a computer program. The CCPA, relying on the Supreme Court's decision in *Benson*, determined that the claims were unpatentable.

80. 425 U.S. 219 (1976). The Court's language adds even more confusion to the actual scope of the *Benson* holding:

As we observed [in *Benson*], [t]he claims were not limited to any particular art or technology, to any particular apparatus or machinery, or to any particular end use. Our *limited holding* . . . was that respondent's method was not a patentable "process" as that term is defined in 35 U.S.C. § 100(b).

Id. at 224 (emphasis added).

81. The Court noted that both the petitioner and respondent had thoroughly briefed the issue of patentability of computer programs, but stated that the question need not be addressed since, in the view of the Court, *Johnston's* claimed invention was obvious in view of the prior art and, therefore, unpatentable under 35 U.S.C. § 103. 425 U.S. at 220.

82. 545 F.2d 152 (C.C.P.A. 1976), *cert. denied*, 46 U.S.L.W. 3181 (U.S. Oct. 4, 1977).

reassigns program priorities as the programs execute.”⁸³ The claims specifically defined the invention as a method which comprises steps for accumulating data pertinent to resource utilization by the system, periodically interrupting the processing programs to analyze the accumulated data, employing the results of the analysis to appropriately change priority operations within the system, resuming execution of the processing programs, and reiteratively executing the method during computer operation. A dependent claim set forth an algorithm for analyzing resource utilization.⁸⁴

Chatfield argued that *Benson* did not foreclose the patentability of all method claims defining inventions most advantageously practiced by a computer program, but only such claims as recited abstract and sweeping mathematical formulae unrestricted to any particular technology or end use.⁸⁵ Chatfield urged that his invention as claimed was limited to computer technology and was directed to a specific process for improving computer performance.

A majority of the CCPA reversed the Board of Appeals’ decision. *Benson* was considered not to preclude the patenting of all computer programs; thus the mere labeling of the process claim as a computer program was not by itself sufficient to warrant an automatic nonstatutory subject matter rejection.⁸⁶ The court indicated that since claims define the invention, an ad hoc review of the subject matter as claimed was required in each case. Proper grounds for a 35 U.S.C. § 101 rejection would be that the claims defined either purely mental steps or a sweeping mathematical algorithm unrestricted

83. *Id.* at 154. A representative claim on appeal is for:

A method of operating a computing system upon more than one processing program concurrently for improving total resource utilization . . . comprising steps for:

- (1) accumulating system utilization data for at least one processing program for at least one resource, said system utilization data comprising resource activity and/or resource degradation data;
- (2) (a) at spaced intervals interrupting the processing programs and analyzing the system utilization of at least one processing program;
- (2) (b) based on this analysis regulating resource access by assigning an individual resource access priority and/or preventing resource access altogether in an unlike manner to at least two resources for at least one processing program to increase thruput;
- (3) resuming the operation of the computing systems on the processing programs; and,
- (4) continually repeating steps (1) to (3).

Id.

84. *Id.*

85. *Id.* at 155.

86. *Id.*

to a particular technology or end use.⁸⁷ The claims were to be judged in their entirety, and from this perspective the majority could not find in Chatfield's claims the objectionable abstractness, the sweeping scope, or the complete preemption of the process which characterized the *Benson* case. Drawing a fine distinction, the majority held that the process claims were limited to a particular technology, that is, the control of programs being processed by a computer, and were, therefore, statutory, unlike Benson's claims which merely set forth algorithmic operations to be performed to change a number from one system to another.⁸⁸

Judge Rich and Judge Lane dissented in *Chatfield*, indicating complete disagreement with the majority's narrow construction of the *Benson* decision. In *Chatfield*, Judge Rich expressed his belief that the circumstances and language of the *Benson* decision could give rise to only one conclusion: The Supreme Court views all programs for general purpose digital computers as nonstatutory subject matter.⁸⁹ In concluding his dissent, Judge Rich stated that the prevailing uncertainty within the computer industry and the PTO over patenting of computer software must necessarily be resolved by an authority higher than the CCPA.⁹⁰

V. THE SIGNIFICANCE OF *Chatfield*

The Supreme Court's opinion in *Gottschalk v. Benson*⁹¹ had served as an ill-defined but nonetheless seemingly impenetrable barrier to an inventor who desired patent protection for his computer software invention. One who contributed a novel implementation of computers to the useful arts was denied protection if he chose to commercially embody his invention as a computer

87. *Id.* at 157. It is a statutory requirement under 35 U.S.C. § 103 (1970) that patentability be decided on an evaluation of the subject matter as a whole. Since the claims define the invention, *see* text accompanying note 42 *supra*, there is support for the holding that the claimed combination must be considered as a unit when patentability is being determined. In the context of Chatfield's invention the claims recite "a method of operating a computing system," and thus the invention was limited to a particular technology and end use.

88. 545 F.2d at 159.

89. *Id.* at 161. Judge Rich has consistently maintained that *Benson* precludes the patenting of process claims. Although he expressed disagreement with the *Benson* holding in *In re Christensen*, 478 F.2d 1392 (C.C.P.A. 1973) by stating that he could "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 . . ." *id.* at 1396, he could find no support in either *Benson* or *Johnston* for limiting the *Benson* holding.

90. *Id.*

91. 409 U.S. 63 (1972).

program. On the other hand, he could obtain a patent if he chose to implement his idea entirely by hardware. The *Chatfield* decision, however, held that the mere affixing of the label "computer program" to an invention claimed as either a process or an apparatus does not license the PTO to deny patentability.⁹² The patent laws provide that the claims define the invention, and if upon examination of the claims it is found that they define a statutory invention, the nature of the commercial embodiment cannot defeat patentability.

The majority and dissent recognized that *Chatfield* is not the final word on whether computer programs are per se statutory subject matter since only the Supreme Court or Congress can finally resolve the issue. The decision does, however, manifest an attempt to develop workable standards vis-à-vis the Supreme Court's *Benson* decision. The court acknowledged that its past *Musgrave* test, which looked to whether the invention as claimed is within the technological arts, is no longer the entire consideration. Instead, it suggests that *Benson*-like questions should be answered by determining whether the invention as claimed is a mere algorithm or amounts to a discovery unrestricted to any particular end use or field of technology, or is so sweeping and abstract so as to preclude, if patented, all others from practicing the invention in yet unanticipated ways. The mental steps doctrine, if it continues to exist as a ground for rejection, appears to be included within the more general rule that one may not patent a mere idea.

Both the majority and the minority reject the notion of any inherent advantage for patentability in those claims denoting a software invention as an apparatus over those claimed as a process. Since the Supreme Court in *Benson* had examined only process claims and found the claims at issue non-statutory, the argument had been made that the holding was not germane to apparatus claims. The court found no such distinction since a skilled claim drafter can often claim the same invention in either form. This holding is consistent with the court's desire to resolve patentability on the basis of substance rather than form, as evidenced by its focus on the nature of the invention as it is defined by the claims to resolve the section 101 issue. Under *Chatfield*, the PTO can no longer use the *Benson* holding to deny patentability to process claims characterized as computer programs. Instead, claimed processes implemented within a computer system must be examined in the

92. The court in *Chatfield* stated: "The unique technological aspects of digital computers and the changes wrought in their operation by associated software programs, coupled with the limited number of precedential court decisions, illustrate the undesirability of deciding the issue of patentability by mere use of the label 'computer program.'" 545 F.2d at 156.

same manner as any other process.⁹³ The CCPA demonstrated acumen in science as well as patent law by recognizing a computer implemented process to be as much within the technological arts as are processes performed by mechanical or chemical counterparts.⁹⁴

VI. THE LARGER PERSPECTIVE

The computer and its controlling programs are recognized as important tools for significant future technological advances. An engineer faced with a problem to solve will, when appropriate, look to computers and computer programs to find a solution expeditiously. Until *Chatfield*, however, his efforts would, in many instances, be unprotected and unrewarded by the patent system. It is agreed that when the engineer "builds" his programs by interconnecting in a logical sequence basic computer instructions, his final product is less tangible and probably more difficult to comprehend than a machine assembled by his mechanical counterpart. The engineer's software invention, however, operates under the same physical laws and obtains tangible results and transformations within the computer. The *Chatfield* invention exemplifies an area of technology rapidly advancing as hardware and software techniques become more sophisticated. It demonstrates the utilization of the processing power and flexibility of a programmed computer in an ever increasing number of applications and foreshadows the discovery of highly complex methods employed wholly within a computer to improve its efficiency. The *Chatfield* decision by legitimizing the patentability of a process which controls the internal functions of a computer will foster the use of computers in inventive and beneficial ways. It demonstrates that the patent laws as currently stated and judicially interpreted, view patentability determinations for such computer software applications as similar to determinations involving conventional mechanical methods and apparatus.

The grant of a patent monopoly is a significant act since it enables the patentee to exclude his invention from the public domain for a limited term. There are certain types of inventions which are not proper subject matter for a patent. One should not, for example, be permitted to monopolize a naturally occurring phenomenon, a mere algorithm, or a method of doing business. Inventions such as these have long been considered as within the public domain. When, however, a program implements an inventive process or con-

93. *Id.* at 157.

94. A unanimous CCPA confirmed this characterization of computer technology in a decision subsequent to *Chatfield*. See *In re Deutsch*, 553 F.2d 689 (C.C.P.A. 1977) (process claims which contemplate the incidental use of computer programs are statutory subject matter).

trols a computer within an inventive apparatus and when such a process or apparatus is applied to a useful field of technology, then the invention encompassing the process or apparatus should be and, as recognized by the CCPA, is patentable.

It has been said that the purpose of the patent system is not to reward individual inventors but to promote the general welfare by increasing the technological information available to the public at large by requiring disclosure of inventions. Public disclosure is strictly forbidden under trade secret law and only when it is the sole means to provide incentive to the inventor to continue his work will the public benefit by this form of intellectual property protection. Copyrights do provide for publication of the work and protect its form as published. The limited scope of copyright protection is often inadequate for protecting the theory which underlies the invention. Patents, however, do provide widespread technology dissemination and, at the same time, for comprehensive protection of the invention, its owner. If computers and computer programs will be in the vanguard of future technological progress, then patents are an appropriate vehicle to foster public access to such progress and to stimulate further invention. The CCPA in *Chatfield* indicated that the patent system can and should play a significant role in the continuing advancement of computer technology and, more importantly, the court recognized that the time has come for the law to advance the state of its own art to be commensurate with its engineering counterpart.

Robert J. Gaybrick