ARTICLE

LEGAL PROTECTION FOR COMPUTER PROGRAMS IN WEST GERMANY

BY Professor Dr. Ulrich Loewenheim †

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I. INTRODUCTION

"One of the most controversial legal issues of our day" is whether industrial property and copyright law can provide adequate protection for computer programs.[1] In most industrialized countries the debate

† Professor at Johann-Wolfgang-Geothe-Universität, Frankfurt am Main; Judge at the Oberlandesgericht (appellate court) Frankfurt am Main.

1. *See* Preface, *The Future of Software Protection*, 47 U. PITT. L. REV. 903 (1986).

over the appropriateness and efficacy of such protection has been developing over the last twenty years.[2] Computer programs are prototypical of the type of highly vulnerable intellectual property which industrial property and copyright law is designed to protect.[3] While the development of software often requires large investments of time and money, modern copying techniques allow quick and inexpensive duplication. Therefore, the producers of original software can easily be deprived of the benefits of their labors. Competitors can copy another's software and market it at a price below that charged by the original producers. Due to the rapid expansion of the applications for, and commercial use of, computer programs, this has become a severe and worldwide problem. In many countries mail-order companies already exist which advertise and sell pirated copies of computer programs. Clearly the producers of computer programs must enjoy some form of legal protection.

What type of industrial property and copyright law should be available to protect computer programs is an intricate, yet crucial question. It is often difficult to incorporate new phenomena into fields of well-established law. The legal treatment of computer programs has so far been no exception. The exact nature of computer programs is difficult to determine. On the one hand, they are related to technological matters. On the other hand, they can hardly be compared to the usual type of inventions. They involve neither processes of a physical nature, nor physical products, but rather methods of organization and administration. They are thus reminiscent of literary works even though they are addressed to machines. Neither industrial property law nor copyright law in their traditional roles seems to be the appropriate instrument for the protection of programs, because both protections were designed for and used to protect very different types of creations. The unique nature of the computer program has lead to broad support for the creation of *sui generis* legislation.[4]

Although the problem of what legal remedies should be available is far from being solved, the rapid increase in piracy and counterfeiting of computer programs demands prompt and practical solutions. For various reasons, in most legal systems, copyright law has become the

2. See generally the essays collected in RECHTSSCHUTZ UND VERWERTUNG VON COMPUTERPROGRAMMEN (M. Lehman ed. 1988).

3. *See* Haberstumpf, *Der urheberrechtliche Schutz von Computerprogrammen*, in RECHTSSCHUTZ UND VERWERTUNG VON COMPUTERPROGRAMMEN, *supra* note 2, at 8.

4. This was proposed not only in Germany, but in other countries as well. See Kindermann, *Special Protection on Systems for Computer Programs—A Comparative Study*, 7 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 301 (1976). Most significantly, the World Intellectual Property Organization [WIPO] initially proposed *sui generis* protection. *See Mustervorschriften für den Schutz von Computersoftware*, 1978 GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT, AUSLANDS-UND INTERNATIONALER TEIL [GRUR INT.] 286.

dominant means used to protect computer programs. Patent law, if applied at all, has been restricted to a secondary role, and a legislation *sui generis* has been enacted only in related fields such as semiconductor chip protection.[5] The more or less parallel development of national laws was not merely accidental. Computer programs enjoy a large international market. Consequently, complimentary protection in different countries creates distinct advantages for the producers of software. Moreover, strong connections among the international legal community within the areas of industrial property law and copyright law have fostered the implementation of similar protections.

However, the debate surrounding the protection of computer programs has not subsided. Too many questions have been left open, and too many problems still remain. West Germany's experience in this area is no exception. It is one of the countries where the dispute has given rise to discussions concerning the fundamental nature and scope of industrial property and copyright law.[6]

This article will review the evolution and the present status of the legal protection of computer programs in West Germany, as well as evaluate the advantages and disadvantages of such protection. This may be of special interest to American authors as the United States joined the Berne Convention on March 1, 1989, and therefore, American authors now enjoy copyright protection in West Germany according to West German copyright law.[7]

In section II protection of computer programs under West German patent law will be discussed. Section III deals with the protection of software afforded by trademark and unfair competition law. Section IV, the main part of the article, considers the protection of computer programs under copyright law. This section discusses the basic standards of copyright (IV 1), examines the appropriateness of applying copyright protection to computer programs in general (IV 2), reviews the West German court decisions implementing copyright protection (IV 3), and surveys the legislative response (IV 4). Section V briefly considers the implications that current international law, especially the Berne Convention, may have on the development of West German copyright law.

5. See national reports for various countries gathered in *AIJA* (Association Internationale des Jeunes Avocats) — *Congress of Lisbon: The Legal Protection of Computer Software*, 1 SOFTWARE L. J. 249 (1986). Countries providing special legislation for semiconductor chips include Denmark (1987), France (1987), West Germany (1987), Japan (1985), the Netherlands (1987), Spain (1988), Sweden (1986), the United Kingdom (1987) and the United States (1984).

6. *See generally* Loewenheim, *Geschützte Werke*, in URHEBERRECHT: KOMMENTAR § 2(73)-(81) (G. Schricker ed. 1987).

7. *See infra*, note 175 and accompanying text.

II. PROTECTION UNDER PATENT LAW

Under current West German law, computer programs cannot be patented. The West German Patent Act explicitly states that "the following in particular shall not be regarded as inventions[:] . . . programs for computers."[8] This, however, must be read in conjunction with another provision of the Patent Act: "The provisions of subsection (2) shall exclude patentability only to the extent to which protection is sought for the above-mentioned elements or activities as such."[9] Consequently, only computer programs "as such" are excluded from patentability. This language has raised some uncertainty as to the scope of patent protection for software. In order to understand the apparent ambiguity between the two provisions it is necessary to explain the requirements of German patent protection and to examine its historical background, including the judicial decisions which occurred prior to the statutory exclusion of computer programs from patentability.

According to West German patent law, patents are granted to inventions which are novel, involve an inventive step, and are susceptible of industrial application.[10] The requirements of novelty, inventive step, and industrial application are explained in §§ 3-5 of the Patent Act. First, an invention shall be considered to be novel if it is not part of the state of the art.[11] The state of the art comprises everything that has been made available to the public by means of a written or oral description, by use, or in any other way, before the filing date of the patent application.[12] Second, an invention involves an inventive step if, with respect to the state of the art, it is not obvious to a person skilled in the art.[13] The inventive step requirement corresponds with the requirement of non-obviousness in the United States Patent Act.[14] Third, an invention shall be considered to be susceptible to industrial application if it can be made or used in any kind of industry, including agriculture.[15]

8. West German Patent Act (Patentgesetz) [hereinafter Patent Act] § 1(2.3), 1981 Bundesgesetzblatt [BGBl] I 1, *translated in* MAX PLANCK INSTITUTE FOR FOREIGN AND INTERNATIONAL PATENT, COPYRIGHT, AND COMPETITION LAW, STUDIES IN INDUSTRIAL PROPERTY AND COPYRIGHT LAW NO. 6, GERMAN INDUSTRIAL PROPERTY AND ANTITRUST LAWS 19-58 (2d ed. 1989) [hereinafter GERMAN INDUSTRIAL PROPERTY AND ANTITRUST LAWS]. Computer programs were excluded under an act of June 21, 1976, 1976 BGBl II 649 (effective Jan. 1, 1978), enacted in the course of the harmonization of national patent laws with the European Patent Convention [hereinafter EPC]. This act excluding computer programs from patentability is referred to as the 1978 Amendment.

9. Patent Act § 1(3). This provision was part of the 1978 Amendment, *supra* note 8.

10. Patent Act § 1(1).

11. Patent Act § 3(1).

12. Patent Act § 3(1).

13. Patent Act § 4.

14. 35 U.S.C. § 103 (1982 & Supp. 1985).

This requirement is intended to promote industrial development and to exclude mere theoretical methods. This is analogous to the requirement of usefulness in the U.S. Patent Act.[16]

Even if computer programs could meet the requirements of novelty, inventive step, and industrial application,[17] this would not answer the crucial question of patentability, which is whether computer programs can properly be regarded as inventions. Although neither the West German Patent Act nor the European Patent Convention (EPC) define the term "invention," it has always been commonly understood that the purpose of patent law is to protect technical inventions only. Therefore, a technical nature is required for patentability.[18] This understanding is confirmed by §§ 3 and 4 of the West German Patent Act which refer to the state of the "technical" art.[19]

The leading definition of the requisite "technical nature" of an invention was given in 1969 by the Bundesgerichtshof (German Federal Supreme Court).[20] In the *Rote Taube* case a pigeon breeder had applied for patent protection for the process of rearing pigeons with red feathers.[21] The Bundesgerichtshof denied the application.[22] The Court explained that breeding was merely a biological, rather than a technical process of production, and hence it did not guarantee the necessary reproducibility.[23] In this context, the Court described a "technical nature" as an "instruction to methodically utilize controllable natural forces to achieve a causally predictable result."[24] In other words, the key element which characterizes the technical nature of an invention is the control of natural forces to achieve a predicted result.

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15. Patent Act § 5(1).

16. 35 U.S.C. § 101 (1982).

17. Novel programs generally meet these requirements. *See* Betten, *Patentschutz von Computerprogrammen*, 2 COMPUTER UND RECHT 311, 312 (1986).

18. *See* Kraßer, *Der Schutz von Computerprogrammen nach deutschem Patentrecht*, in RECHTSSCHUTZ UND VERWERTUNG VON COMPUTERPROGRAMMEN, *supra* note 2, at 109; G. BENKARD, PATENTGESETZ § 1(41) (7th ed. 1981).

19. While the EPC and English translations use the term "state of the art," the German term is "Stand der Technik" (state of the technical art).

20. Judgment of March 27, 1967, Bundesgerichtshof, 52 Bundesgerichtshof in Zivilsachen [BGHZ] 74 (*Rote Taube*), *translated in* 1 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 136 (1970).

21. 52 BGHZ at 75.

22. *Id.*

23. *Id.* at 81. For its part, Patent Act § 2(2) explicitly denies patent protection of plant or animal varieties or essentially biological processes for the production of plants or animals.

24. *Id.* at 79 ("Lehre zum planmäßigen Handeln unter Einsatz beherrschbarer Naturkräfte zur Erreichung eines kausal übersehbaren Erfolges.").

In 1976 the Bundesgerichtshof directly addressed the applicability of patent law to computer programs in the *Dispositionsprogramm* case.[25] The opinion offers little information about the nature of the program under consideration. Apparently, the program aided business decisions by calculating certain commercial results.[26] Referring to its former definition of the "technical nature" of an invention, the Court held that the *Dispositionsprogramm* program was merely a sequence of organization and lacked the requisite "technical nature" necessary for patentability.[27] The Court thus distinguished between the solution of purely mathematical and organizational problems by following certain logical rules and the utilization of natural laws such as those existing in the fields of physics or chemistry to control a physical process.[28]

Later decisions clarified this distinction between the solution of mathematical problems and the control of natural forces. In 1980, the Bundesgerichtshof decided that an antilock brake system operated by a computer program could qualify for patent protection.[29] In that case, a program prevented the wheels of an automobile from locking by applying the appropriate brake pressure, which was calculated based on the angular velocity of the wheels.[30] The Court explicitly stated that not all computer programs lack a technical nature.[31] The case shows that at least in the field of control engineering programs can utilize "natural forces" in order to regulate a technical process, and therefore can be protected by a patent.[32]

In contrast, the Bundesgerichtshof in the same year denied the patentability of a program designed to cut rolled steel into pieces suitable for further processing.[33] In that case, the Bundesgerichtshof pointed out that the "nucleus of an invention" must be of a technical nature.[34] It

25. Judgment of June 22, 1976, Bundesgerichtshof, 67 BGHZ 22 (*Dispositionsprogramm*), *translated in* 8 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 558, 560 (1977). To date, the Bundesgerichtshof has decided seven cases concerning the patentability of computer programs. In addition to the *Dispositionsprogramm* case these decisions are: Judgment of April 21, 1977, 79 GEWERBLICHER RECHTSSCHUTZ UND URHEBERRECHT [GRUR] 657 (*Straken*); Judgment of June 7, 1977, 80 GRUR 102 (*Prüfverfahren*); Judgment of February 14, 1978, 80 GRUR 420 (*Fehlerortung*); Judgment of May 13, 1980, 82 GRUR 849 (*Antiblockiersystem*); Judgment of September 16, 1980, 83 GRUR 39 (*Walzstabteilung*); Judgment of March 11, 1986, 88 GRUR 531 (*Flugkostenminimierung*). The leading cases are discussed *infra*.

26. 67 BGHZ at 23.

27. *Id.* at 26.

28. *Id.*

29. Judgment of May 13, 1980, Bundesgerichtshof, 82 GRUR 849 (*Antiblockiersystem*).

30. *Id.* at 849.

31. *Id.* at 851.

32. *Id.* at 850.

33. Judgment of Sept. 16, 1980, 83 GRUR 39 (*Walzstabteilung*).

34. *Id.* at 41.

does not suffice that the invention "as a whole" has a technical nature.[35] Since the Bundesgerichtshof failed to find that the "nucleus" of the invention involved had a technical nature, patentability was not granted.[36] The Court elaborated on this analysis in another decision which concerned a computer program designed to minimize the fuel consumption of airplanes.[37] The program regulated the fuel flow of an airplane engine by adjusting the throttle.[38] Some of the factors determining the fuel flow were of a technical nature, such as distance, altitude, minimum speed, etc.[39] Greater emphasis, however, was placed on economic factors such as fuel price, cost of flight hours, availability of the airplane, etc.[40] The Court, noting the predominate influence of economic factors as opposed to technical factors, found that the program lacked a "technical nature" and, therefore denied patentability.[41]

Although the 1978 amendment to the Patent Act, which excludes patentability was effective when these decisions were handed down, the respective patent applications had been filed prior to Jan. 1, 1978.[42] Therefore, the Bundesgerichtshof decided the cases without reference to either the statutory exclusion or the provision modifying exclusion from patent protection "as such."[43] Thus, the relationship between the judicial decisions emphasizing the requirement of a "technical nature" and the statutory exclusion of computer programs from patentability by the 1978 Amendment remains somewhat unclear. The confusion may be resolved by assuming that the cases mentioned above did not concern the protection of computer programs "as such," but rather concerned separate inventions that either contained a computer program or were applied by using a computer program.[44]

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35. *Id.* at 40-41. It remains unclear how the "nucleus of an invention" can be defined and distinguished from "the invention as a whole," but the term nonetheless conveys the highly restrictive approach of the Court.

36. *Id.* at 40.

37. Judgment of March 11, 1986, Bundesgerichtshof, 88 GRUR 531 (*Flugkostenminimierung*).

38. *Id.* at 532.

39. *Id.* at 533.

40. *Id.*

41. *Id.*

42. This is true even for the most recent case. *See* Judgment of March 11, 1986, Bundesgerichtshof, 88 GRUR 531 (*Flugkostenminimierung*).

43. No court has yet applied the statutory exclusion of computer programs under the Patent Act as amended in 1978. Act of June 21, 1976, 1976 BGBl II 649 (effective Jan. 1, 1978).

44. See the German National Report in 2 ANNUAIRE (l'Association Internationale pour la Protection de la Propriété Intellectuelle [AIPPI]) 6, 13 (1988), *summarized in English* at 23.

The decision to restrict the patentability of computer programs in West Germany paralleled a European and an even greater international trend.[45] While drafting the European Patent Convention (EPC) in the early 1970s, the patentability of computer programs became an important issue.[46] For reasons similar to those which concerned West German lawmakers, this question was very controversial.[47] However, the Convention's major goal was the enactment of a uniform set of guidelines, and it was generally agreed that this goal should not be endangered by a dispute over the patentability of computer programs.[48] This is the most likely reason why computer programs were included in the catalogue of non-patentable items in Article 52 EPC.[49] As discussed above, West Germany, in the course of the harmonization of its national laws with the EPC, also excluded computer programs from patentability in 1978.[50]

From today's perspective, it is doubtful whether enough consideration was given to this enactment. In light of the need for protection of computer programs, as well as the problems involved in the application of copyright law to software, the strict exclusion of patent law appears to be rather precipitate. Other countries, such as the United States, grant patent law a far broader scope of application, even though they fail to secure general patent protection for computer programs.[51]

However, there appears to be a growing tendency to give the statutory exclusion a less strict interpretation, thus extending the scope of patent protection. In applying Article 52 EPC, which excludes computer programs from patent protection, the European Patent Office has taken a more liberal approach than the Bundesgerichtshof. It stresses that the technical nature of an "invention as a whole" rather than simply the "nucleus of an invention" may suffice for patentability. This view has been expressed both in the guidelines for examination in the European

45. *See* Gall, *Der Schutz von Computerprogrammen nach europäischem Patentrecht*, in RECHTSSCHUTZ UND VERWERTUNG VON COMPUTERPROGRAMMEN, *supra* note 2, at 142; *see also* Betten, *supra* note 17, at 312.

46. *See* Kolle, *Die patentfähige Erfindung im europäischen Patenterteilungsübereinkommen*, in MITARBEITERFESTSCHRIFT FÜR EUGEN ULMER 216 (1973); G. GALL, MITTEILUNGEN DER DEUTSCHEN PATENTANWÄLTE, 184 (1985).

47. *See generally* Kolle, *supra* note 46. Protection was similarly denied in Austria, Switzerland, the Netherlands and France.

48. *Id.*

49. *Id.*

50. Act of June 21, 1976, 1976 BGB1 II 649 (effective Jan. 1, 1978).

51. *See* Nimmer & Franqui, *United States Protection of Computer Software Technology*, 1 SOFTWARE L. J. 417, 433-44 (1986).

Patent Office[52] and in several decisions.[53] With a few caveats, it could be said that this has already effected the standards applied by the West German Patent Office. Although there are no explicit statements for that proposition, some scholars believe that in recent cases[54] the West German Patent Office has adopted a more liberal view.[55] However, the situation is still unclear.

In conclusion, one can only state that computer programs, as such, are not patentable. However, the decisions of the Bundesgerichtshof granting patent protection to computer programs, the apparent statutory limitation on strict exclusion of computer programs from patent protection, and the recent decisions of the West German Patent Office seem to indicate that the scope of patent protection as applied to computer software in West Germany may expand.

III. PROTECTION UNDER TRADEMARK AND UNFAIR COMPETITION LAW

Due to the limited protection afforded computer programs under patent law, protection by other legal means became all the more urgent. Because the technical nature of many programs could not be demonstrated, software producers turned to other legal doctrines applicable more generally to intellectual property and commercial transactions. Trademark law and unfair competition law have been considered as alternative means of protection. Protection, found lacking under patent law, was granted to computer programs by the courts under unfair competition and trademark law.[56]

52. *Amendment to the Guidelines for Examination in the EPO*, 8 O.J. EUR. PAT. OFF. 173, 177 (1985).

53. *See* Judgment of July 15, 1986, EPO, 1987 GRUR INT. 173 (*Computerbezogene Erfindung/VICOM*); Decision of May 21, 1987, Judgment of the Board of Appeal of the EPO, 3 COMPUTER UND RECHT 671 (*Röntgeneinrichtung*); *see also* Payraudeau, *Neuere Entscheidungen der Technischen Beschwerdekammern des EPA*, 1989 GRUR INT. 478, 480.

54. Judgment of August 20, 1985, Bundespatentgericht, 88 GRUR 307 (*Digitale Signalverarbeitungsanordnung*); Judgment of July 22, 1986, Bundespatentgericht, 3 COMPUTER UND RECHT 366 (*Computertomograph*); Judgment of August 12, 1987, Bundespatentgericht, 89 GRUR 799 (*Elektronisches Stellwerk*); Judgment of July 25, 1988, Bundespatentgericht, 91 GRUR 42 (*Rolladen-Steuerung*).

55. *See* Betten, *Neue Entscheidungen des Bundespatentgerichts zum Patentschutz von softwarebezogenen Erfindungen*, 3 COMPUTER UND RECHT 347, 348 (1987); Betten, *Patentschutz für software-bezogene Erfindungen*, 90 GRUR 248 (1988); Brandi-Dohrn, *Der Schutz von Computersoftware in Rechtsprechung und Praxis*, 89 GRUR 1, 3 (1987); Loewenheim, *Möglichkeiten des Rechtsschutzes für Computerprogramme*, 4 COMPUTER UND RECHT 799, 804 (1988).

56. Unfair competition law can grant complementary protection where patent law does not apply, *e.g.*, against the copying of unpatented items. This protection does not prevent mere copying as patent law would do, but rather targets unfair behavior in competition, *e.g.*, deceiving the consumer as to the source of origin. *See generally* A. BAUMBACH & W. HEFERMEHL, WETTBEWERBSRECHT, § 1 UWG (407) (15th ed. 1988). Since pro-

1. Trademark Protection

In West Germany, as well as in other countries, trademarks perform an identification function. A trademark identifies the origin of goods or services by associating a product or service with a particular source.[57] Trademark protection can be acquired by registering the mark with the Patent Office.[58] The owner then has the exclusive right to commercially use the trademark.[59] Any person using the registered or a confusingly similar mark for the registered or for similar goods or services can be sued for infringement.[60] Therefore, trademark protection prevents other persons from using the mark but not from providing the same product or service. The distribution of a product can only be prohibited under trademark law if the trademark is attached to the product such that using the product simultaneously displays the trademark.[61]

Trademarks can prevent the unauthorized distribution of computer programs if the disk, the cover, the manual, etc. carry the mark. In most cases, trademark protection can neither prevent the unauthorized copying of the program itself nor the sale of such unauthorized copies. However, in some special cases, a trademark may be installed in a computer program in such a way that the trademark becomes visible on the screen when the program is being used. West German courts have held that the commercial use of such programs could be an unauthorized use of the trademark.[62] For example, in the *Pengo* case, the plaintiff was

tection by patent law and unfair competition law is given on different grounds, an erosion of unfair competition protection would not be likely were the scope of patent law to be increased.

57. For further reference, see A. BAUMBACH & W. HEFERMEHL, WARENZEICHENRECHT, Einl. WZG, no. 10 (12th ed. 1985).

58. West German Trademark Act (Warenzeichengesetz) [hereinafter Trademark Act] § 2(1), 1968 BGBl I 29, *translated in* GERMAN INDUSTRIAL PROPERTY AND ANTITRUST LAWS, *supra* note 8, 111-23.

59. Trademark Act § 15(1).

60. Trademark Act §§ 24, 31.

61. This follows from § 15 of the Trademark Act, which grants the trademark owner the exclusive right to use the mark but does not grant the exclusive right to use a product or service that does not bear the mark.

62. *See* Judgment of June 13, 1983, Oberlandesgericht [hereinafter OLG] Frankfurt (appellate court), 85 GRUR 753, 756 (*Pengo*); Judgment of Aug. 4, 1983, OLG Frankfurt, 1984 WETTBEWERB IN RECHT UND PRAXIS [WRP], 79 (*Donkey Kong Junior II*). For further discussion of trademark protection for computer programs, see Bohlig, *Warenzeichen: Eine alternative Schutzmöglichkeit für Computerprogramme?*, 2 COMPUTER UND RECHT 126 (1986); Gravenreuth, *Juristische relevante technische Fragen zur Beurteilung von Computer-Programmen*, 88 GRUR 720, 725 (1986); Loewenheim, *Urheberrechtlicher Schutz von Videospielen*, in BEITRÄGE ZUM SCHUTZ DER PERSÖNLICHKEIT UND IHRER SCHOPFERISCHEN LEISTUNGEN: FESTSCHRIFT FÜR HEINRICH HUBMANN 307, 308 (1985); Schweyer, *Der warenzeichenrechtliche Schutz von Computerprogrammen*, in RECHTSSCHUTZ UND VERWERTUNG VON COMPUTERPROGRAMMEN, *supra* note 2, at 204.

exclusively licensed to manufacture and distribute a Japanese videogame under the trademark "Pengo."[63] This trademark was also registered in West Germany.[64] When played, the game would first present the characters involved in the game.[65] Among them was the main character, "Pengo," whose name appeared on the screen.[66] The defendant acquired pirated copies of the game which were nearly identical with the original game.[67] The most significant difference between the originals and the pirated copies was that the main figure's name had been changed from "Pengo" to "Pento."[68] The defendant owned video arcades where he used these pirated copies.[69] The Oberlandesgericht Frankfurt held that the videogame did not meet the standards for copyright protection,[70] but that playing the game in public amusement centers was an unauthorized use of a confusingly similar trademark which infringed the trademark owner's rights.[71]

This is not to say that trademark protection is sufficient to protect all computer programs. As discussed above, such protection can only be helpful where, in addition to copying and distributing the program, the items which carry the mark, such as the disk, the cover, and the manual, are also distributed. However, this is not always the case. Often the program alone is copied and distributed.[72] Furthermore, as the videogame cases show, merely running the program in public (i.e. without making use of a marked disk or the manuals) can severely violate the owner's rights. In such cases, only the installation of the trademark within the program itself would result in trademark infringement.[73] However, not every program is susceptible to installation of a trademark,[74] and even if the program contained such a safeguard, in most cases the trademark could be easily removed. In conclusion, trademark protection is of limited effectiveness.

63. 85 GRUR at 754 (*Pengo*).
64. *Id.*
65. *Id.*
66. *Id.*
67. *Id.*
68. *Id.*
69. *Id.*
70. *Id.*
71. *Id.* at 756.
72. Such a copy can be made on an unmarked disk. The unauthorized user could then use the program without a manual or could copy a borrowed manual. In addition, handbooks that explain popular programs are often available, obviating the need for the original manual.
73. *See* Bohlig, *supra* note 62, at 129.
74. Trademarks are more likely to be installed in application programs, such as games or word processing programs, than in operation programs, such as a utility program.

2. Protection by Unfair Competition Law

Courts have repeatedly protected computer programs under unfair competition law.[75] The statutory basis for this doctrine is § 1 of the UWG[76] which grants an injunction or damages in cases of unfair competition. Most of the law under this general clause is of judicial creation and development. One judicial doctrine that has developed holds that misappropriation of the results of another's work violates unfair competition law, especially where another's products have been copied or imitated.[77] Under certain conditions, this doctrine may fill in some gaps where industrial property and copyright protection do not apply to computer programs.[78]

Courts have granted protection to computer programs under unfair competition law, most often in cases where, for various reasons, they held that the requirements for protection under patent or copyright law were not met. For example, in the *Donkey Kong Junior* cases, which involved pirated video game programs, the Oberlandesgericht Frankfurt granted protection on the basis of unfair competition law after denying copyright protection.[79] In *Donkey Kong Junior I*, the plaintiff sold a Japanese videogame named "Donkey Kong Junior".[80] The defendant sold videogames under the name "Junior King" which were identical to the "Donkey Kong Junior" game, except that the copyright notice was

75. *See, e.g.*, Judgment of July 21, 1983, OLG Frankfurt, 85 GRUR 757 (*Donkey Kong Junior I*) and Judgment of Aug. 4, 1983, OLG Frankfurt, 1984 WRP 79 (*Donkey Kong Junior II*), both discussed *supra*, note 62 and accompanying text. *See also* Judgment of June 12, 1983, Landgericht [hereinafter LG], München I (court of first instance), 2 COMPUTER UND RECHT 332. For the protection of computer programs under unfair competition law, see generally Lehmann, *Der wettbewerbsrechtliche Schutz von Computerprogrammen gem. § 1 UWG—sklavische Nachahmung und unmittelbare Leistungsübernahme*, in RECHTSSCHUTZ UND VERWERTUNG VON COMPUTERPROGRAMMEN, *supra* note 2, at 230; Loewenheim, *supra* note 62, at 307, 308; Loewenheim, *supra* note 55, at 801.

76. West German Unfair Competition Act (Gesetz gegen den unlauteren Wettbewerb (UWG)) [hereinafter Unfair Competition Act], BGBl III 43-1, *translated in* GERMAN INDUSTRIAL PROPERTY AND ANTITRUST LAWS, *supra* note 8, 124-34.

77. This doctrine was originally developed by the Reichsgericht (the former German Supreme Court). *See* Judgment of April 7, 1910, Reichsgericht, 73 Reichsgericht in Zivilsachen [RGZ] 294; Judgment of October 3, 1926, Reichsgericht, 115 RGZ 180. The doctrine was revived by the Bundesgerichtshof. *See, e.g.*, Judgment of January 22, 1952, Bundesgerichtshof, 5 BGHZ 1 (*Hummelfiguren I*). For further references and a detailed discussion, see A. BAUMBACH & W. HEFERMEHL, WETTBEWERBSRECHT, § 1 UWG (411)-(413) (15th ed. 1988).

78. Unfair competition applies if the duplication is unfair behavior in competition (*e.g.*, deceiving the consumer as to the source of origin); for a detailed discussion see A. BAUMBACH & W. HEFERMEHL, WETTBEWERBSRECHT, § 1 UWG (407) (15th ed. 1988).

79. Judgment of July 21, 1983, OLG Frankfurt (appellate court), 85 GRUR 757 (*Donkey Kong Junior I*); Judgment of Aug. 4, 1983, OLG Frankfurt, 1984 WRP 79 (*Donkey Kong Junior II*).

80. 85 GRUR at 757.

removed.[81] The Court held that the standards for copyright protection were not met by the game, but that the use of identical unauthorized copies was an unlawful misappropriation of the results of another's work.[82]

However, the protection granted by unfair competition law is not as effective as that afforded by patent or copyright law. The purpose of unfair competition law is not to protect a personal creation, but rather to prevent unfair behavior in the market.[83] The limited nature of this goal has several consequences. The mere reproduction of computer programs can be prohibited under patent and copyright law.[84] In contrast, unfair competition law only prevents the *distribution* of another's product, but not its unauthorized reproduction.[85] Furthermore, under unfair competition law the injured party does not have recourse against a person who acquires a pirated copy of a computer program in good faith (i.e. without knowing about the piracy), while under patent and copyright law the use of a protected item obtained in good faith can be prohibited. Moreover, under copyright law the owner of the copyright is entitled to have the unauthorized copies destroyed,[86] which is not possible under unfair competition law. The market protection rationale also explains why unfair competition law provides no assignable right of distribution, whereas copyright law provides an assignable right of distribution[87] which can be

81. *Id.*

82. *Id.* at 758. The same decision was rendered in Judgment of Aug. 4, 1983, OLG Frankfurt, 1984 WRP 79 (*Donkey Kong Junior II*).

83. *See* A. BAUMBACH & W. HEFERMEHL, WETTBEWERBSRECHT, § 1 UWG (407) (15th ed. 1988).

84. Patent Act § 9 grants the proprietor of the patent the exclusive rights to control the use of the patented invention. The Copyright Act § 15 grants the exclusive right of reproduction of the copyrighted material. West German Copyright Act (Gesetz über Urheberrecht und verwandte Schutzrechte) [hereinafter Copyright Act], 1965 BGBl I 1273, *translated in* GERMAN INDUSTRIAL PROPERTY AND ANTITRUST LAWS, *supra* note 8, 148-80 (2d ed. 1989).

85. The reason that unauthorized reproduction is not prevented by unfair competition law is best explained by comparing the different goals of copyright and patent law as opposed to unfair competition law. The former two protect personal works, *e.g.*, creations or inventions, while the latter aims at preventing unfair behavior in the market. The mere reproduction of another's work without distribution of the copies is not regarded as behavior in the market. This principle has been stated repeatedly as a general rule by the Bundesgerichtshof in cases that did not involve the protection of computer programs. *See* Judgment of May 3, 1968, 50 BGHZ 125, 129 (*Pulverbehälter*); Judgment of May 15, 1968, 70 GRUR 698, 701 (*Rekordspritzen*); Judgment of October 23, 1981, 84 GRUR 305, 308 (*Büromöbelprogramm*). It is unlikely that German courts will change this principle, which has broad commercial applicability, in order to provide better protection for computer programs.

86. Copyright Act § 98.

87. Copyright Act § 17.

limited to certain areas or products.[88] Finally, protection under unfair competition law is available for a far shorter period of time than protection under patent and copyright law.[89]

Therefore, in West Germany, unfair competition law can be useful as an additional means of protecting computer programs. The Bundesgerichtshof indicated its preference for unfair competition law as a means to protect computer programs after setting high standards for copyright protection in its *Inkasso-Programm* decision.[90] Indeed, most cases to date have protected computer programs on the basis of unfair competition law rather than copyright law. However, reliance primarily on unfair competition law is ill advised, as it cannot be regarded as a sufficient means of protection. As pointed out above, in comparison to other types of protection and especially to copyright, it is less effective both in its requirements and in its scope of application.

IV. PROTECTION UNDER COPYRIGHT LAW

Since neither patent nor trademark nor unfair competition law could provide sufficient protection for computer software, copyright appeared to be the appropriate solution.[91] The legal debate began to focus on copyright law with the recognition that computer programs could meet the requirements of copyrightability even prior to their explicit inclusion in the list of copyrightable items.[92] At the same time, copyright

88. *See generally* Loewenheim, *Verbreitungsrecht*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 17(8)-(14).

89. Under unfair competition law, the statute of limitations period is far shorter than under copyright and patent law. Section 21(1) of the Unfair Competition Act provides that the statute of limitations period for an unfair competition action is six months, commencing with notice of the infringement. Absent such notice, the statute of limitations period is three years from the moment of infringement. Unfair Competition Act § 21(1). Section 102 of the Copyright Act provides that the statute of limitations period for an action for damages is three years commencing with notice of the infringement and, absent such notice, thirty years. For actions other than damages, the regular period of three years applies. BÜRGERLICHES GESETZBUCH [BGB] § 195. *See generally* Wild, *Verjährung*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 102(2). The right to claim destruction of unauthorized copies is not subject to any statute of limitations. Copyright Act § 98, 102(2). Under patent law, the statute of limitations period is three years commencing with notice of the infringement. Absent such notice, the statute of limitations period is thirty years from the date of the infringement itself. Patent Act § 141.

90. Judgment of May 9, 1985, Bundesgerichtshof, 87 GRUR 1041 *translated in* 17 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 81 (1986). For a discussion of this case, see *infra* notes 126-133 and accompanying text.

91. West German copyright law focuses on "author's rights," in contrast to the focus on unauthorized reproduction ("copyright") in the United States. Hence, resort to copyright protection was only considered because of the incomplete protection afforded software by patent and unfair competition law.

92. 1985 amendment of Copyright Act § 2, 1985 BGBl I 1137.

protection was gaining popularity internationally. However, the appropriateness of copyright protection did not go unquestioned. In West Germany in particular, scholars feared that the traditional nature of copyright might be endangered and even ruined by extending protection to computer programs. Additionally, a certain degree of tension between the courts and the legislature has added some uncertainty to the scope of copyright protection.

To explain the current state of West German copyright law, the basic standards of copyright law will first be described. Second, the appropriateness of copyright protection as applied to computer programs will be discussed. Third, the judicial decisions applying copyright to computer programs will be reviewed and critiqued. Finally, the 1985 amendment which explicitly includes computer programs in the catalogue of protectable works will be discussed.

1. The West German Copyright Act

West German copyright law is codified in the Copyright Act of 1965[93] which replaced earlier legislation dating from the beginning of the century.[94] Section 1 of the Copyright Act appears to extend copyright protection to all authors: "Authors of literary, scientific and artistic works shall enjoy protection for their works in the manner prescribed by this Act."[95] However, section 2 of the Copyright Act qualifies the types of authorship that deserve protection: "Works within the meaning of this Act include only personal intellectual creations."[96] This means that only original works are copyrightable.

The standards of originality are higher than they are in U.S. copyright law. Under West German law, it does not suffice that the work owes its origin to the author, i.e. that the author did not copy the expression contained in the work from someone else.[97] Rather, the work must be the product of the author's personality and a certain degree of creativity is essential; trivial and commonplace works are not protected.[98] On the other hand, in contrast to U.S. law,[99] fixation in a

93. West German Copyright Act (Gesetz über Urheberrecht und verwandte Schutzrechte) 1965 BGBl I 1273, *translated in* GERMAN INDUSTRIAL PROPERTY AND ANTITRUST LAWS, *supra* note 8, 148-80.

94. Literatururhebergesetz, 1901 Reichsgesetzblatt [RGB1] 227, Kunsturhebergesetz, 1907 RGB1 7.

95. Copyright Act § 1.

96. Copyright Act § 2(2). Copyright Act § 2(1) provides the catalogue of protectable works.

97. In the United States, originality is distinguished from novelty. Originality simply means independent creation. *See, e.g.*, L. Batlin & Son, Inc. v. Snyder, 536 F.2d 486, 490 (2d Cir. 1976), *cert. denied*, 429 U.S. 857 (1976).

98. *See* Loewenheim, *Geschützte Werke*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 2(12).

tangible medium of expression is not required.[100] Nevertheless, the work must be expressed in such a way that the work may be perceived by human senses.[101]

The author acquires a copyright by the creation of the work. No formalities are required.[102] The author has the exclusive right to exploit his work in material and non-material form.[103] The right of material exploitation includes the right of reproduction[104] and the right of distribution.[105] The right of non-material exploitation includes the rights of performance,[106] broadcasting,[107] etc. In cases of infringement, an injured party may seek injunctive relief, as well as damages or the profits which resulted from the infringement.[108] The duration of the copyright is the life of the author plus seventy years.[109]

A West German copyright must not be regarded as a mere property right. It has a strong personal component which is mainly manifested in the moral rights provided by West German copyright law.[110]

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99. 17 U.S.C. § 102 (1982).

100. Judgment of May 9, 1985, Bundesgerichtshof, 87 GRUR 1041, 1047, (1985) (*Inkasso-Programm*), *translated in* 17 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 81 (1986).

101. Therefore, an author can copyright an improvised speech, but not pure thought; the work must be expressed in a perceptible medium.

102. In accordance with the Berne Convention for the Protection of Literary and Artistic Works of Sept. 9, 1886, *as amended in* Stockholm July 14, 1967 *and in* Paris July 14, 1971, 828 U.N.T.S. 221, the West German Copyright Act does not set up any formal requirements as prerequisites for copyright protection.

103. Copyright Act § 15.

104. Copyright Act § 16.

105. Copyright Act § 17.

106. Copyright Act § 19.

107. Copyright Act § 20.

108. Copyright Act § 97(1) provides:

> "As against any person who infringes a copyright or any other right protected by this Act, the injured party may bring an action for injunctive relief requiring the wrongdoer to cease and desist if there is a danger of repetition of the acts of infringement as well as an action for damages if the infringement was intentional or the result of negligence. In lieu of damages the injured party may recover the profits derived by the infringer from the acts of infringement together with a detailed accounting reflecting such profits."

109. Copyright Act § 64(1).

110. Among other things the author is protected against distortion and mutilation of his work (Copyright Act § 14), has the right to determine whether and how his work is to be published (Copyright Act § 12), and has the right of recognition of authorship (Copyright Act § 13).

Other manifestations of this are that the *author* is always the owner of the copyright[111] even if it is a work made for hire,[112] and that the copyright as such is basically not assignable.[113]

In addition, the West German Copyright Act provides not only copyright but also "related rights" or "neighboring rights."[114] These rights protect works which are not original creations as defined by copyright law, but which are in some way related to copyrightable works. For example, performing artists cannot acquire a copyright for their performance because a performance is not the creation of a work, but rather an interpretation of another's work. Instead, performers are protected by a "neighboring right."[115] Similarly, sound recordings are protected by a neighboring right.[116] Although the recordings are not original works of authorship, the legislature has provided recording artists with this limited form of protection.

2. Basic Considerations on Copyrightability of Computer Programs

The legal requirements for copyright protection, as described above, can be met by computer programs. Such programs are, in the sense of § 1 of the Copyright Act, of a scientific character.[117] Provided they reach the requisite level of originality, computer programs comply with the other conditions of §§ 1 and 2 of the Copyright Act.

Nevertheless, a controversy has arisen as to whether the fundamental nature of copyright allows it to be applied to computer programs.

111. Copyright Act § 7.

112. Because copyright as such is not assignable, an employer must obtain a license from the employee to reproduce the work. In general, the grant of such a license is implicitly contained in the employment contract.

113. Copyright Act § 29.

114. The concept of "related rights" or "neighboring rights" is based on the assumption that there are types of works which, while not creative enough to deserve copyright protection, are related to a creative activity to such a degree that it seems appropriate to provide an approximate form of protection. In West German law the provisions covering related rights form the second part of the Copyright Act, §§ 70-95. Very different types of activities are protected by related rights, *e.g.*, live performances and sound recordings. The scope of protection varies according to the type of activity protected; as a consequence no general standard exists. As computer programs are not addressed under the related rights provisions of the Copyright Act, the kind and scope of protection that the related rights doctrine could offer to computer programs is not known. Because related rights are created by statute, protection through related rights must be determined by the legislature. For further details of the concept of related rights, see E. ULMER, URHEBER- UND VERLAGSRECHT 15-18 (3d ed. 1980).

115. Copyright Act §§ 73-84.

116. Copyright Act §§ 85-86.

117. Judgment of May 9, 1985, Bundesgerichtshof, 87 GRUR 1041, 1046 (*Inkasso-Programm*), *translated in* 17 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 81 (1986).

It has been argued that such an application would extend copyright law beyond its intended scope and change its true nature.[118] Copyright law, so the argument goes, would become "diluted" and "converted into a technical property right."[119] Ironically, the technical nature of computer programs, which was regarded as being insufficient to allow patent protection, was brought forward as an argument against copyright protection.[120] Furthermore, the duration of copyright protection, namely the author's life plus seventy years, was regarded as absolutely inappropriate for computer programs.[121] As a consequence, it was recommended that computer programs should not be protected by copyright law, but rather by *sui generis* legislation specifically adapted to the special needs of computer software.[122]

Admittedly, the traditional role of copyright approached these rather idealistic standards. Originally, copyright was designed primarily to protect works of literature and the fine arts. In the world of ideas, the copyright served the noble purpose of protecting an author from plagiarism and intellectual theft. However, in an increasingly industrialized and technical world, the use and exploitation of copyrights has evolved into a commercial marketing process pitting large, well-financed corporations against individual authors with relatively scant resources. Therefore, copyright is necessary to protect the author's intellectual rights as well as to provide him with the equitable remuneration he deserves. Consequently, in the modern economic world, copyright law can no longer be regarded as a pure matter of aesthetics limited to literature and the fine arts.

Moreover, the West German Copyright Act explicitly includes works of applied art in its scope of protection as well as illustrations of a scientific or technical nature, such as drawings, maps, charts, models, etc.[123] This demonstrates that copyright is not limited to literature and the fine arts and that works of a technical nature need not necessarily be excluded from protection. Finally, the argument that computer programs do not need protection seventy years after the author's death does not mean that programs fail to meet the requirements for copyright. True,

118. *See* Dietz, *Das Problem des Rechtsschutzes von Computerprogrammen in Deutschland und Frankreich, (Die kategoriale Herausforderung des Urheberrechts)*, 11 BIJBLAD INDUSTRIËLE EIGENDOM [B.I.E.] 305, 310 (1983); *see also* Dietz, *Entwickelt sich das Urheberrecht zu einem gewerblichen Schutzrecht?*, in GEDENKSCHRIFT FÜR FRITZ SCHÖNHERR 111 (1986).

119. Dietz, 11 B.I.E. at 310.

120. *Id.*

121. *Id.* Dietz states that computer programs neither need nor deserve such duration of protection.

122. *Id.*

123. Copyright Act § 2(1.4) and (1.7), respectively.

most programs are obsolete after a far shorter period. There are many instances where copyrighted materials do not need the protection for the full amount of time alloted by statute. Maps and charts, for example, are often out of date far earlier. No one, so far, has drawn the conclusion on the basis of the length of needed protection that such works are not copyrightable. Thus, the nature and scope of copyright do not prevent its application to computer programs.

3. Judicial Application of Copyright Law to Computer Programs

This fundamental and partly scholarly dispute was accompanied by a growing number of court decisions applying copyright law to computer programs. The first case to be decided concerned a debt collection program.[124] The defendant, a programmer, designed a program for the plaintiff and granted him an exclusive license.[125] Nevertheless, the defendant made copies of the program which he subsequently sold to a third party.[126] The plaintiff claimed he was protected by the Copyright Act and filed suit based on the infringement of his exclusive license.[127] The court of first instance, the District Court of Mannheim, denied that computer programs were eligible for copyright protection.[128] The The Court stated that copyrightability requires a certain "intellectual-aesthetic substance" in the work which, as a matter of course, did not exist in computer programs.[129]

However, this ruling misinterpreted the requirements of copyright protection. As discussed above, the primary requirement is that of originality. This does not involve any aesthetic component. Such a component may exist in some categories of works, such as those of fine art or music, but an aesthetic component is not essential to copyright protection. Certain categories of explicitly protected works, such as technical drawings or scientific literature, lack any aesthetic component at all.

The Appellate Court of Karlsruhe reversed the District Court's decision, and held that no aesthetic component is required in order for a

124. Judgment of June 12, 1981, LG Mannheim, 1981 BETRIEBSBERATER [BB], 1543; Judgment of Feb. 9, 1983, OLG Karlsruhe (appellate court), 85 GRUR 300; Judgment of May 9, 1985, Bundesgerichtshof (Supreme Court), 87 GRUR 1041 (*Inkasso-Programm*), *translated in* 17 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 81 (1986).

125. Judgment of May 9, 1985, Bundesgerichtshof, 87 GRUR 1041.

126. *Id.* at 1042.

127. *Id.*

128. Judgment of June 12, 1981, LG Mannheim, 1981 BB 1543.

129. *Id.* For a more detailed discussion of this case, see Röttinger, *The Legal Protection of Computer Programs in Germany: Renunciation of Copyrights?*, 4 COMPUTER LAW & PRACTICE 34, 34-36 (1987).

work to be eligible for copyright protection.[130] According to the Appellate Court, computer programs can be original and creative works and, therefore, may qualify for copyright protection.[131] Although scientific methods and algebraic formulas, especially algorithms, are not copyrightable,[132] many individual decisions must be made while programming and numerous conflicting objectives must be weighed against each other.[133] These decision-making factors apparently satisfied the creative element necessary for copyright protection.[134]

Gradually, more courts affirmed, as a general principle, the copyrightability of computer programs. The Oberlandesgericht Frankfurt held in the *Pengo* and *Donkey Kong Junior* cases[135] that computer programs as a matter of principle can be copyrightable. While algorithms, which are mathematical rules, are excluded from protection, a program's organization, as well as the selection and arrangement of material, may demonstrate the requisite level of originality and creativity.[136] Nevertheless, in the *Pengo* and *Donkey Kong Junior* cases copyright protection was denied because, in the Court's view, the plaintiffs had offered no evidence to prove that the programs at issue reached the required level of creativity and originality.[137]

130. Judgment of Feb. 9, 1983, OLG Karlsruhe, 85 GRUR 300, 306 (*Inkasso-Programm*).

131. *Id.* at 305. For a detailed analysis of originality in programming, see Ulmer and Kolle, *Copyright Protection of Computer Programs*, 14 INT'L REV. OF IINDUS. PROP. COPYRIGHT L. 159, 172-80 (1983).

132. 85 GRUR at 305. The rationale for the exclusion of algorithms from copyright protection is that the use of scientific methods and algebraic formulas should be unrestricted and not monopolized for individual profit. *See generally* Loewenheim, *Geschützte Werke*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 2(31), (32), (77).

133. 85 GRUR at 306.

134. *Id.* at 307.

135. Judgment of June 13, 1983, OLG Frankfurt, 85 GRUR 753 (*Pengo*); Judgment of July 21, 1983, OLG Frankfurt, 85 GRUR 757 (*Donkey Kong Junior I*); Judgment of Aug. 4, 1983, OLG Frankfurt, 1984 WRP 79 (*Donkey Kong Junior II*). For a discussion of these cases, see *supra* notes 62-82 and accompanying text.

136. *See* 85 GRUR 755 (*Pengo*); 85 GRUR 757 (*Donkey Kong Junior I*); 1984 WRP 79 (*Donkey Kong Junior II*).

137. 85 GRUR 755 (*Pengo*); 85 GRUR 757 (*Donkey Kong Junior I*); 1984 WRP 79 (*Donkey Kong Junior II*). The Oberlandesgericht Frankfurt did not evaluate the creativity and originality of the underlying game and the graphic presentation. Games as such are not protected under West German copyright law. *See* 85 GRUR at 756 (*Pengo*); Judgment of March 31, 1983, Hanseatisches Oberlandesgericht, Hamburg, 85 GRUR 437 (*Puckman*); *see generally* Loewenheim, *Geschützte Werke*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 2 (2). The Oberlandesgericht Frankfurt considered instead that videogames might be protected as motion pictures. The court denied such protection because the "action" of the game and the order of pictures were determined by the player and not by a producer or art director. *See* 85 GRUR 755 (*Pengo*); 85 GRUR 757 (*Donkey Kong Junior I*); 1984 WRP 79 (*Donkey Kong Junior II*). This reasoning may be criticized on the grounds that the producer and art director of a videogame predetermine the different possible actions and the order of pictures and that the player only makes a choice from among

In a case decided by the Bundesarbeitsgericht (Federal Labor Court),[138] the plaintiff was employed as a structural engineer by the defendant.[139] The plaintiff designed several computer programs for structural calculations which were used in the defendant's enterprise.[140] When the employment contract ended, the defendant refused to return the programs to the plaintiff.[141] The plaintiff brought an action against the defendant on grounds of copyright infringement.[142] The Court held that computer programs can in principle be copyrightable.[143] However, the Court did not address the question of whether the plaintiff had acquired a copyright. Even if he had, the plaintiff was held to have granted a license to the defendant as part of his employment contract which entitled the defendant to retain the programs.[144] Other decisions also affirmed that computer programs may at least in principle enjoy copyright protection.[145]

Finally, in 1985, the Bundesgerichtshof delivered its *Inkasso-Programm* decision,[146] which directly addressed the issue of originality. The Bundesgerichtshof affirmed as a matter of principle the copyrightability of computer programs. However, it set the standards for originality so high that most computer programs appear to be excluded from protection. The Court stated that the level of originality shall be

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those predetermined possibilities. *See* Loewenheim, *supra* note 62, at 318; Nordemann, *Das Computerprogramm als urheberrechtlich geschützes Werk*, in FESTSCHRIFT FÜR ROEBER, 310 (1982). For these reasons, the Oberlandesgericht Hamburg granted protection to a videogame as a motion picture, but not to the underlying computer program. 85 GRUR at 436 (*Puckman*). The facts of that case are not published, but from the reasoning it can be assumed that the case involved the use of pirated copies of videogames at video arcades. *Id.* at 437.

138. Judgment of Sept. 13, 1983, Bundesarbeitsgericht, 86 GRUR 429 (*Statikprogramme*).

139. *Id.* at 430.

140. *Id.*

141. *Id.*

142. *Id.*

143. *Id.* at 431.

144. *Id.*

145. *See* Judgment of Nov. 1984, OLG Frankfurt (appellate court), 87 GRUR 1049 (*Baustatikprogramm*); Judgment of Aug. 13, 1981, OLG Koblenz, 1983 BB 992 (*Bauwerks-Informationssystem*); Judgment of May 5, 1984, OLG Nürnberg (appellate court), 1984 BB 1252 (*Glasverschnittprogramm*); Judgment of June 24, 1981, LAG Schleswig-Holstein (labor court), 1983 BB 994; Judgment of May 21, 1981, LG Kassel, 1983 BB 992; Judgment of July 13, 1982, LG Mosbach, 1982 BB 1443; Judgment of Dec. 21, 1982, LG München I, 1983 BB 273; Judgment of Aug. 29, 1985, LG München I, 2 COMPUTER UND RECHT 384 (1986); Judgment of Oct. 24, 1984, LG Düsseldorf, 2 COMPUTER UND RECHT 133 (1986); Judgment of June 26, 1987, Amtsgericht Düsseldorf (court of first instance), 3 INFORMATIK UND RECHT 153 (1988).

146. Judgment of May 9, 1985, Bundesgerichtshof, 87 GRUR 1041 (*Inkasso-Programm*), *translated in* 17 INT'L REV. OF INDUS. PROP. & COPYRIGHT L. 681 (1986).

examined in two steps.[147] In the first step, the program at issue is compared with all relevant pre-existing programs in order to determine whether it possesses creative components which are absent from those other pre-existing works.[148] All components which are similar to components already used in existing programs cannot be used to establish originality.[149]

If the program contains creative components which are original, the analysis proceeds to the second step.[150] The creative components of the program are compared with the work of an average programmer.[151] Originality exists only if these creative components "clearly exceed" an average programmer's skills.[152] The key test then is as follows:

> The know-how of the average programmer, the mere craftsmanship, the mechanical/technical linking and assembly of the material, do not fall within the subject matter of copyright. The minimum requirements of copyrightability are met only at a somewhat higher level; they presuppose a significant amount of creativity with respect to selection, accumulation, arrangement and organization, as compared to the general, average ability.[153]

This test developed by the Bundesgerichtshof has been severely criticized.[154] There are three main objections:

(1) The Court's test appears to be similar to the standards applied to determine patentability rather than those used to determine copyrightability. Comparing the program at issue with pre-existing programs is,

147. *Id.* at 1047; *see also* Erdmann, *Möglichkeiten und Grenzen des Urheberrechts*, 2 COMPUTER UND RECHT 249, 253 (1986) (Erdmann is the member of the Bundesgerichtshof who drafted the *Inkasso-Programm* decision).

148. 87 GRUR at 1047 (*Inkasso-Programm*).

149. *Id.*

150. *Id.*

151. *Id.*

152. *Id.* at 1047, 1048.

153. *Id. See generally* Röttinger, *supra* note 129.

Applying the two-step analysis, the Bundesgerichtshof reversed the appellate court's decision. 87 GRUR at 1048. The appellate court had found originality in the operational steps of the program's code. *Id.* at 1048. As the Bundesgerichtshof pointed out, the selection, collection, arrangement and organization of these steps did not reach the level of originality as required by the Bundesgerichtshof, and what was expressed by the code is, as a general rule, not copyrightable. *Id.*

154. *See* Bauer, *Rechtsschutz von Computerprogrammen in der Bundesrepublik Deutschland — eine Bestandsaufnahme nach dem Urteil des Bundesgerichtshofs von 9. Mai 1985*, 1 COMPUTER UND RECHT 9 (1985); Haberstumpf, *Grundsätzliches zum Urheberrechtsschutz von Computerprogrammen nach dem Urteil des Bundesgerichtshofs vom 9. Mai 1985*, 88 GRUR 222 (1986); Haberstumpf, *supra* note 3, at 26; Röttinger, *Abkehr vom Urheberrechts (em Schutz für Computerprogramme?*, 1 INFORMATIK UND RECHT 12 (1986); Herberger, *Einführung in die Programmiersprache "BASIC" (Teil 3)*, 1 INFORMATIK UND RECHT 229, 235 (1986); H. MORITZ & B. TYBUSSECK, COMPUTERSOFTWARE, RECHTSSCHUTZ UND VERTRAGSGESTALTUNG, §§ 134-146 (1986); Loewenheim, *Geschützte Werke*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 2 (80).

in truth, a test for novelty, even though the Court explicitly denies this.[155] The question of whether or not "certain components are already contained in pre-existing works" is identical to the question of whether or not they are novel. Novelty, however, is a requirement of patentability, but is not essential to copyrightability.[156] As in the United States, under West German copyright law a work can be original, and therefore copyrightable, even if it is identical with a pre-existing work, provided that it was not copied from the pre-existing work but was instead created by the individual efforts of its author. For this reason, originality and hence copyrightability can be found even if a comparison with pre-existing works does not reveal any creative component not yet contained in such pre-existing works.

In addition, under § 1 of the West German Patent Act, patentability requires that an invention involve an inventive step, and this is not present if the inventive activity does not exceed average skills. In contrast, the test for copyrightability does not consider the skill level of the author. Instead the true test is whether or not a work is original. No one will contest that the works of an average author, an average composer or an average artist are copyrightable. Therefore, no reason exists for the assumption that computer programs must clearly exceed the average in order to be copyrightable.

(2) This decision places severe limitations on the protectability of computer programs. Originality will not be found unless the program contains elements which an average programmer's skills could not create, and as a consequence, average programs are not copyrightable.[157] This result, of course, does not adequately protect computer programs. Average programs, as well as highly sophisticated programs, need protection against piracy and counterfeiting. Indeed, the "average" program designed by an individual may require greater protection than one designed by a sophisticated producer which may employ additional alternative forms of protection. It is also doubtful whether the Supreme Court's ruling follows the legislative intent behind the 1985 Amendment. Certainly, this amendment was written with the goal of protecting average computer programs as well as above-average ones.[158]

155. The Court states: "This comparison contains no examination of novelty which would be irrelevant to copyrightability." 87 GRUR at 1047.

156. *See* Loewenheim, *Geschützte Werke*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 2(20).

157. Indeed v.Gamm, chairman of the Senate which delivered the *Inkasso-Programm* decision, stated that in his view copyrightability of computer programs would play nearly no role in practice and that at most five percent of all computer programs in the market are copyrightable. *See Mitteilungen aus der Deutschen Vereinigung für gewerblichen Rechtsschutz und Urheberrecht*, 88 GRUR 729, 731 (1986).

158. For this amendment, see note 92.

(3) Finally, the Court's analysis requires a highly theoretical approach and raises immense problems in its practical application. Many questions implicit in the Court's test are difficult to answer. What is the level of an average programmer's skills?[159] When does a program "clearly exceed"[160] that level? Which elements of a program must exceed the average level? Who decides these questions? No one has answered these questions yet. It has been proposed that the extent and complexity of programs should be considered as an indication of originality.[161] This, eventually, might be an easier way to determine originality but it contradicts the basic doctrine of copyright law that originality cannot be brought about by the extent of a work.[162]

The high standard set by the Bundesgerichtshof may be explained by the underlying belief that, as discussed above, copyright protection should be confined to matters of literature and the fine arts, and should not extend too far into the field of industry and commerce. Thus, although in West German law computer programs are copyrightable in principle, the Supreme Court has set very high standards for copyrightability.[163] It is possible that the Court will not maintain such a strict posture and that future decisions will lower the standards for copyrightability. For now, however, authors of computer programs have become reluctant to seek copyright protection in court, presumably because they do not want a valuable program to be declared to lack originality and creativity. Since the Supreme Court's ruling, only a few cases have been decided, nearly all of them by lower courts. None of those decisions discuss in detail the issue of copyrightability, its standards or the necessary requirements. These decisions instead refer to testimony offered by expert witnesses.[164] So far, West Germany, unlike the United States, has not developed standards to evaluate the originality and creativity of computer programs.[165]

In conclusion, copyright is only theoretically the major source of protection for computer programs in West Germany. At present, few

159. *See* 87 GRUR at 1047 (*Inkasso-Programm*).

160. *Id.* at 1048.

161. *See* Gravenreuth, *supra* note 62, at 721. The Bundesgerichtshof, however, stated that length should not be a consideration. 87 GRUR 1041, 1048 (*Inkasso-Programm*).

162. *See* Loewenheim, *Geschützte Werke*, in URHEBERRECHT: KOMMENTAR, *supra* note 6, § 2(23). Such a doctrine would also tend to encourage lengthy, complicated programs as opposed to short, elegant ones.

163. 87 GRUR 1041 (*Inkasso-Programm*).

164. *See* Judgment of June 26, 1987, Amtsgericht, Düsseldorf, 3 INFORMATIK UND RECHT 153 (1988). Most of these decisions are not published.

165. *See* Whelan Associates v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

programs reach the required level of originality. The majority of programs can only be protected, if at all, by other means, namely patent, trademark or unfair competition law.

4. Legislation

In a parallel development, the national legislature decided the dispute between *sui generis* protection and copyright protection in favor of the latter. In early 1985, after an amendment to the Copyright Act had already been drafted, a provision was added at the last moment which explicitly declared that computer programs were copyrightable works. Section 2(1) of the Copyright Act now reads:

> "The literary, scientific and artistic works protected hereunder include, in particular:
>
> 1. Literary works, such as writings and speeches, and programs for data processing; . . . "

The parliament's report explicitly stated that the standard of protection for programs as established by the courts was not being changed but was only being confirmed in the statutory law.[166] A major reason for this enactment was the legislature's intent to include West Germany as a member of the growing international family of countries which protect computer programs by copyright law. This would ensure that the international copyright conventions such as the Berne Convention and the Universal Copyright Convention would apply to West Germans. As noted above, piracy of computer programs is an international problem which requires international protection. Such protection is provided by the international copyright conventions which extend copyright protection to authors who are citizens of foreign countries on the basis of the host country's national treatment.[167] However, this protection only applies to copyrightable works. If computer programs were not protected by copyright but instead by *sui generis* law, the international conventions would be inapplicable and, as previous experience has shown, it might have taken years or even longer to establish new conventions.

The current state of West German law, which grants only limited protection to computer programs, once again raises the question of whether *sui generis* legislation should be enacted. As discussed above,

166. BUNDESTAGSDRUCKSACHE 10/3360 S.18. It is doubtful, however, that the "standard of protectability of programs as established by the courts" to which the report alludes included the Bundesgerichtshof's decision in the *Inkasso-Programm* case, which was rendered only eight days earlier.

167. *See infra* notes 176-183 and accompanying text.

West German copyright law already provides protection for related (neighboring) rights for performing artists, motion picture producers and for photographs not reaching the level of originality required for "pure" copyright. It has been proposed that similar legislation be drafted for computer programs which do not meet the standards of originality.[168] This would result in two types of protection: full copyright protection for original programs; and a reduced protection for programs lacking sufficient originality. While in recent years this seemed to be limited to a rather theoretical discussion, the West German government has recently stated that the enactment of such a related right for computer programs could be within the scope of possibility.[169] Such a legislative scheme has not been endorsed by a majority of the legislature and the competent authorities have not taken steps towards enactment of such a scheme. Even if *sui generis* legislation were enacted, West Germany would remain a member of the international community which protects computer programs mainly by copyright.

V. INTERNATIONAL DEVELOPMENTS

1. European Community

In contrast to the West German experience, granting copyright protection for computer programs has found strong support in the developing European Community law. In September 1988, the Commission of the European Community delivered its *Green Paper on Copyright and the Challenge of Technology*[170] which, among other things, dealt with computer programs. The paper aimed at initiating a discussion on relevant copyright issues with the further goal of proposing a directive for the harmonization of national copyright laws. In early 1989, the Commission delivered its *Proposal for a Council Directive on the Legal Protection of Computer Programs.*[171] The directive proposes that computer programs be protected as literary works under national copyright law. Standards of originality would be the same as for other literary works. The term of

168. Schulze, *Urheberrechtsschutz von Computerprogrammen—geklärte Rechtsfrage oder bloße Illusion?*, 87 GRUR 997, 1006 (1985); Schulze, *Der Schutz der kleinen Münze im Urheberrecht*, 89 GRUR 769, 778 (1987). This opinion is often expressed at conferences, *e.g.*, at the September 1989 meeting of the Association Internationale Littéraire et Artistique (ALAI) in Quebec.

169. *Report on the Results of the 1985 Copyright Amendment*, BUNDESTAGSDRUCKSACHE 11/4929 at 43.

170. COMMUNICATION FROM THE COMMISSION OF THE EUROPEAN COMMUNITIES (88) 172 final (1988).

171. COMMUNICATION FROM THE COMMISSION OF THE EUROPEAN COMMUNITIES (88) 816 revision final (1989), *also published in* 91 GRUR INT. 564 (1989).

protection would be for fifty years from the date of creation. The directive is being discussed by the various member states, and it is likely to take some time before it takes its final shape.

Given these discussions in the European Community as well as the worldwide trend toward copyright protection for computer programs, it is unlikely that West Germany will pursue a radically different approach.[172] Even if additional protection through related rights were established, such rights would not enjoy international protection under the Berne Convention as this convention applies only to copyright.[173] Therefore, one can predict that copyright will become the major means for protection of computer programs, supported by patent and unfair competition law protection. It seems desirable, if not imperative, that in West Germany standards for copyright protection of computer programs be lowered and adapted to the general standards of copyright as applied to other types of works. The harmonization of national laws under the EEC directive will certainly influence this process, especially since Article 1(4a) of the directive explicitly states that the standards of originality for computer programs shall be the same as for other literary works.[174]

2. Protection under the Berne Convention

Because the United States joined the Berne Convention[175] on March 1, 1989,[176] U.S. authors are entitled to enjoy copyright protection in West Germany according to West German copyright law.[177] The Berne Convention extends copyright protection to authors of member countries on the basis of national treatment. A member country must accord works by foreign authors which are covered by the Berne Convention the same protection as it grants to works of domestic authors.[178] The Berne Convention provides a minimum protection to authors, which includes protection, without the necessity of complying with any formal-

172. *See* Treaty Establishing the European Economic Community, March 25, 1957, art. 189, para. 3, 298 U.N.T.S. 3, 79.

173. "Related rights" are included in the German Copyright Act, but this does not mean that they form part of copyright. Therefore, the Berne Convention does not apply to them.

174. *Supra* note 171.

175. Berne Convention for the Protection of Literary and Artistic Works of Sept. 9, 1886, *as amended in* Stockholm July 14, 1967, *and in* Paris July 24, 1971, 828 U.N.T.S. 221 [hereinafter Berne Convention].

176. Berne Convention Implementation Act of 1988, Pub. L. No. 100-568, 102 Stat. 2853 (codified as amended in scattered sections of 17 U.S.C.).

177. For the definition of a work covered by the Berne Convention, see 17 U.S.C.S. § 101 (Law. Co-op. Supp. 1989).

178. Berne Convention, art. 5, para. 1.

ities,[179] a term of protection for the life of the author plus fifty years,[180] and the protection of moral rights of authors in order to prevent distortions, mutilations or other changes to the work that might damage the author's reputation or honor.[181]

Therefore, American authors do not have to comply with any formalities to enjoy copyright protection in West Germany. If they design a copyrightable program and an act of infringement occurs in West Germany, they can bring suit before a West German court. However, copyrightability would be determined according to West German law and, therefore, according to the standards as set by the Bundesgerichtshof. The lower standards of U.S. copyright law would not apply. Consequently most of the protection provided to U.S. computer programs by West Germany would be accomplished by unfair competition law.

VI. CONCLUSIONS

The effort to apply copyright law to computer programs has brought about a discussion of the fundamental problems of copyright law, its true nature, as well as its scope of application. The experience in West Germany illustrates the extent of debate that has occurred. The discussion has proven quite fruitful, deepening the understanding and the analysis of the subject matter of copyright and industrial property law. Certainly, issues remain to be resolved. Nevertheless, the increasing amount of piracy and counterfeiting demands a quick, comprehensive and effective solution. The law cannot stand by and idly engage in philosophical debates while endangered rights go unprotected.

Allowing computer programs to have copyright protection appears to be the best solution. Copyright protects the expression but not the idea, and therefore, does not grant a monopoly which would hinder the development of other programs which contain the same idea but utilize a different form of expression.[182] Furthermore, copyright protection is generally easy to acquire, at least within member states of the Berne Convention, because no prerequisite formalities exist. Copyright law also has the advantage of being an established body of law which guarantees a certain uniformity of protection among the various national legal systems. In contrast, *sui generis* legislation would create a patchwork system in which the degree of protection would depend on national boundaries. Above all, the international conventions favor the use

179. *Id.* art. 5, para. 2.
180. *Id.* art. 7.
181. *Id.* art. 6 *bis.*
182. This argument is stressed in the European Commission's *Proposal for a Council Directive on the legal protection of computer programs, supra* note 171, § 3.6.

of copyright law by upholding its application between member states. This international protection is essential for computer programs which are widely traded and therefore exposed to international piracy.[183] Objections to the appropriateness of copyright protection should not be overvalued. Copyright law is certainly broad enough to protect objects related to commerce and industry, as well as works of literature and the fine arts.

As this article demonstrates, it is desirable that copyright be the major instrument of protection for computer programs. Nevertheless, it should be supplemented by other rights, i.e., patent, trademark and unfair competition law. In West Germany, where the present standards for copyright are quite high, it is especially advisable to explore the protection available under unfair competition law. By combining these different forms of protection, it should be possible to guarantee that computer programs receive the protection they deserve. The law is continually undergoing further development. This is especially so in industrial property and copyright law, which must keep abreast with the rapid technical and commercial changes occurring in the world today.

183. See also the report on Question 57 (protection of computer software) of the German National Group, 4 ANNUAIRE (AIPPI) 27 (1988), where a similar opinion has been expressed.

ARTICLE

OUTER SPACE AND THE MULTILATERAL TREATY-MAKING PROCESS

BY GENNADY M. DANILENKO †

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I. INTRODUCTION

Among the different branches of modern international law, the law of outer space most vividly illustrates the problems inherent to multilateral treaty-making. From the beginning of the space age, deliberate efforts to create a coherent body of law for outer space and space activities were undertaken at the United Nations. Within this framework, the conclusion of multilateral treaties has become the principal means of enacting pertinent legal rules. At one time, states participating in the

† Visiting Professor, Boalt Hall School of Law, University of California at Berkeley, U.S.A. Doctor of Law, Senior Research Fellow at the Institute of State and Law, Academy of Sciences, Moscow, USSR. This article is an expanded version of a paper published in 5 SPACE POLICY 321-29 (1989). It is printed here with the kind permission of the original publisher. The author would like to express his appreciation to the editors of the *High Technology Law Journal*: Maureen Dorney, Jennelle Hall, Robert Benson and Helen Shin, for their constructive advice and many helpful suggestions.

multilateral treaty-making process were able to reach agreement on a number of treaties establishing basic principles for this particular branch of international law. However, subsequent multilateral negotiations aimed at resolving the more specific legal issues posed by rapidly developing space activities have failed to produce satisfactory results. While the need for adequate space law-making is as urgent as ever, the international community has discovered that it is far more difficult to reach consensus on new legal rules today.

In view of the noticeable slowdown in the law-making process, the time has come for a reassessment of the existing legislative techniques. Given the global character and the importance of outer space activities, which affect the interests of the entire international community, we must make a serious effort to formulate proposals aimed at improving the law-making process for outer space. Against the background of the recent general review of the multilateral treaty-making process, undertaken under the aegis of the United Nations,[1] this article raises some of the issues in the ongoing debate about the most suitable and effective techniques for law-making concerning space and space activities.

This article examines past experience in space treaty-making and clarifies the need for continuous law-making on the global level. It then discusses the process and prospects of the consensus law-making techniques traditionally used in this particular area of law. This article then proposes a new approach to consensus law-making based on the notion of qualitative participation. Next, this article discusses problems posed by he continued insistence on anticipatory law-making, the proliferation of negotiating forums and the increasing fragmentation of the legal regime applicable to outer space. It explores the need and prospects for a proposed comprehensive space convention. Finally, this article concludes by formulating the future prospects of space law-making.

II. THE CONTINUOUS NEED FOR SPACE LAW-MAKING

For a certain period, which may be described as the "golden age" of space law-making, rapidly developing space activities were accompanied by the adoption of a number of general multilateral treaties which deal exclusively with outer space and space activities. The first multilateral space convention, the 1967 Outer Space Treaty,[2] establishes a basic framework for the international legal regime in outer space. The

1. *See* REVIEW OF THE MULTILATERAL TREATY-MAKING PROCESS, U.N. Doc. ST/LEG/SER.B/21, U.N. Sales No. E/F.83.V.8 (1985).

2. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

treaty declares that the exploration and use of outer space should be carried out for the benefit and in the interest of all countries and "shall be the province of mankind."[3] It provides that outer space, including the moon and other celestial bodies, should be free for exploration and use by all states[4] and that outer space is not subject to national appropriation.[5] The treaty prohibits the placement of nuclear weapons, or any other kinds of weapons of mass destruction, in outer space and declares that the moon and other celestial bodies shall be used "exclusively for peaceful purposes."[6] The treaty contains provisions on the rescue and return of astronauts.[7] States bear international responsibility for national activities in outer space,[8] as well as international liability for damage.[9] According to the treaty, states conducting activities in outer space should inform the United Nations and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities.[10] The treaty has been ratified by 91 countries.[11]

The Outer Space Treaty provides the basis for all subsequent treaties and other legal instruments relating to space activities. The 1968 Agreement on the Rescue of Astronauts[12] expands the relevant general provisions of the Outer Space Treaty. The 1972 Convention on International Liability for Damage Caused by Space Objects[13] provides a detailed regime for the liability of states for damage caused by space objects on the surface of the earth, to aircraft in flight and in outer space. The 1975 Convention on Registration of Objects Launched into Outer Space[14] specifies the requirements for the registration of space objects. The 1979 Moon Treaty,[15] while reaffirming a number of principles

3. *Id.* art. I.
4. *Id.*
5. *Id.* art. II
6. *Id.* art. IV.
7. *Id.* art. V.
8. *Id.* art. VI.
9. *Id.* art. VII.
10. *Id.* art. XI.
11. *See Present Status of Outer Space Treaties*, 17 J. SPACE L. 98-102 (1989); *See also* M. BOWMAN & D. HARRIS, MULTILATERAL TREATIES: INDEX AND CURRENT STATUS (1984 & Supp.).
12. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, T.I.A.S. No. 6599, 672 U.N.T.S. 119 [hereinafter Agreement on the Rescue of Astronauts].
13. Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762, 961 U.N.T.S. 187.
14. Convention on Registration of Objects Launched into Outer Space, Nov. 12, 1974, 28 U.S.T. 695, T.I.A.S. No. 8480, 1023 U.N.T.S. 15.
15. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, G.A. Res. 34/68, 34 U.N. GAOR Supp. (No. 46) at 77, U.N. Doc. A/34/46 (1979) [hereinafter Moon Treaty].

contained in the 1967 Outer Space Treaty, also declares the moon the "common heritage of mankind"[16] and calls for the creation of an international regime to govern the exploitation of the natural resources of the moon.[17]

Along with these multilateral treaties dealing specifically with space and space activities, the international community has promulgated a number of other conventions bearing on space activities. Of major importance are the Partial Nuclear Test Ban Treaty,[18] which bans nuclear explosions in outer space, the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques,[19] which bans the use of certain environmental modification techniques aimed at changing the dynamics, composition or structure of outer space, and the International Telecommunications Convention,[20] which contains provisions relating to space communications.

However, the successful adoption and subsequent entry into force of these multilateral treaties do not mean that further development of space law will focus exclusively on their implementation and interpretation. From a broad theoretical perspective, a viable system of space law presupposes continuous law-making activity. As a practical matter, the need for further law-making becomes clear after a perfunctory glance at existing space treaty law. Not all the essential subjects amenable to treaty regulation have been resolved. Even during the "golden age," states failed to reach agreement on a number of important problems. Some of them, such as the delimitation of outer space and the character and utilization of the geostationary orbit, are still on the agenda of the UN Committee on the Peaceful Uses of Outer Space (UNCOPUOS), a central legislative body dealing with space and space activities.[21]

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16. *Id.* art. 11.

17. *Id.* art. 11, para. 5.

18. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, Aug. 5, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43 [hereinafter Partial Nuclear Test Ban Treaty].

19. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, Dec. 10, 1976, 31 U.S.T. 333, T.I.A.S. No. 9614, 1108 U.N.T.S. 151.

20. International Telecommunication Union, *The International Telecommunications Convention* (1982) [hereinafter ITU Convention].

21. *See* U.N. Doc. A/AC.105/430 at 4 (1989). Not all states believe, however, that there is a need for the legal definition of the boundary between air space and outer space. In particular, the U.S. has traditionally expressed the view that the absence of a definition or delimitation of outer space has not created and will not create practical problems for the progress in the exploration of outer space. The U.S. representatives urge the UNCOPUOS to drop this matter from the agenda of its Legal Sub-Committee. *See* U.N. Doc. A/AC.105/PV.332 at 17-18 (1989) (statement of the U.S. representative in the UNCOPUOS). For a presentation of this approach on the doctrinal level, see, e.g., Hosenball & Hofgard, *Delimitation of Air Space and Outer Space: Is a Boundary Needed Now?*, 57 U. COLO. L. REV. 885-893 (1986).

Advances in space technology and the need for international cooperation in the exploration and use of outer space require more specific and detailed rules to govern new activities. One urgent issue, high on the agenda of the UNCOPUOS, is adequate regulation of the use of nuclear power sources in outer space.[22] More generally, there is a growing need to agree on rules and procedures for the prevention of the pollution of outer space and the earth from space activities.[23] The development of space military capabilities requires an adequate normative response from the international community, which is concerned with the escalation of an arms race in outer space.[24] Expanding space economic activities[25] require the creation of a favorable legal framework.[26]

There are also many important issues which are regulated only by relevant UN General Assembly resolutions.[27] These include the use of satellites for direct television broadcasting, covered by the 1982

22. U.N. Doc. A/AC.105/430 at 4 (1989).

23. For expressions of concern over the environmental effects of space activities on the part of the international scientific community, see *Report on Environmental Effects of Space Activities*, U.N. Doc. A/AC.105/420 (1988) (submitted by the Committee on Space Research and the International Astronautical Federation). During the discussions in the UNCOPUOS on the issues relating to the use of nuclear power sources in outer space, it was proposed that special provisions on the prevention of "space pollution" be included into the relevant Draft Articles under discussion. *See* U.N. Doc. A/AC.105/430 at 21 (1989). There is also a growing number of official statements calling for the study and discussion of space environmental problems, especially of issues relating to space debris. In 1989 Austria, Belgium, Canada, Federal Republic of Germany, the Netherlands, Nigeria and Sweden proposed that the issue of space debris be put on the agenda of the Scientific and Technical Sub-Committee of the UNCOPUOS. *See* U.N. Doc. A/AC.105/L.179 (1989) (U.N. documents denoted "L." are issued in restricted distribution. These documents are only available at the UN libraries in New York City, New York and Geneva, Switzerland.). *Cf.* U.N. Doc. A/AC.105/PV.322 at 33 (1989) (statement in the UNCOPUOS by the representative of the Soviet Union: "[T]he Soviet delegation shares the disquiet over the state of space environment voiced by a large number of Committee members. We are prepared to discuss that problem."); U.N. Doc. A/AC.105/PV.323 at 67-68 (1989) (statement in the UNCOPUOS by the representative of Brazil: "We strongly recommend that the Committee deals, on a priority basis, with questions relating to the threats posed to the Earth's environment by space activities and to the preservation of space's environment itself.").

24. For a comprehensive discussion of relevant problems, see MAINTAINING OUTER SPACE FOR PEACEFUL USES (N. Jasentuliyana ed. 1984).

25. On the growing economic advantages of space activities, see SPACE ACTIVITIES AND EMERGING INTERNATIONAL LAW 39-50 (N.M. Matte ed. 1984); J. GOODRICH, THE COMMERCIALIZATION OF OUTER SPACE: OPPORTUNITIES AND OBSTACLES FOR AMERICAN BUSINESS (1989).

26. For details, see Böckstiegel, *Commercial Space Activities: Their Growing Influence on Space Law*, 12 ANNALS AIR & SPACE L. 175 (1987).

27. On the role of the UN General Assembly resolutions in the development of space law, see Kopal, *The Role of United Nations Declarations of Principles in the Progressive Development of Space Law*, 16 J. SPACE L. 5 (1988).

Principles Governing Direct Television Broadcasting,[28] and the use of satellites for remote sensing, governed by the 1986 Principles Relating to Remote Sensing.[29]

Although at this juncture there is no consensus on the need to transform the recommendatory rules contained in these resolutions into legally binding rules of conduct,[30] it may well be that such a consensus will emerge when the pertinent activities acquire more significant proportions. One of the existing space treaties directly envisages an agenda for further law-making activities. The Moon Treaty provides that states parties to this agreement "undertake to establish an international régime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible."[31] The Moon Treaty also provides that, ten years after its entry into force, the question of the review of the Treaty shall be included in the provisional agenda of the UN General Assembly.[32]

These and other related issues establish a broad agenda for international space law-making in the years to come. In assessing the prospects for further space law-making, one has also to take into account other factors. Thus, technological progress has traditionally exerted a particularly strong influence on the formation of space law. One may

28. G.A. Res. 37/92, U.N. Doc. A/37/51 at 98 (1982).

29. G.A. Res. 41/65, 41 U.N. GAOR Supp. (No. 53) at 115, U.N. Doc. A/41/53 (1986).

30. After the adoption of the 1982 Principles Governing Direct Television Broadcasting by the UN General Assembly, different opinions were expressed on the need for further legislative action. Thus, the Soviet representative in the UNCOPUOS expressed the view that "the Legal Sub-Committee should as quickly as possible proceed to draft a convention on international direct television broadcasting on the basis of the declaration of principles." U.N. Doc. A/AC.105/PV.247 at 16 (1983). By contrast, the representative of Italy stated:

> The text of principles may be reviewed in due course so as to meet with general acceptance and to make implementation of these principles more likely. This leads us to think that for the time being the wisest course could possibly consist of letting a certain period of time pass before re-examining the issue in the light of further development.

U.N. Doc. A/AC.105/PV.249 at 16 (1983). The U.S. representative, for his part, clearly rejected the idea of considering the 1982 Principles "as the basis for negotiating a treaty on the subject." *Id.* at 34-35.

Similarly, as regards the 1986 Principles Relating to Remote Sensing, the Soviet representative expressed the opinion that the approval of the Principles by the UN General Assembly "should be followed by the formulation of an appropriate international agreement." U.N. Doc. A/AC.105/C.2/SR.449 at 3 (1986). *Cf.* U.N. Doc. A/SPC/41/SR.38 (1986). This view is not shared, however, by other states. Thus, the representative of the U.S. stated that the embodiment of the Principles in "a new legal instrument was neither necessary nor desirable." *Id.* at 4. *Cf. Id.* at 3 (statement of the representative of Japan).

31. Moon Treaty, *supra* note 15, art. 11, para. 5.

32. *Id.* art. 18.

assume that technology push will continue to bring about an increasing variety of space activities and consequently raise new problems for the decision-makers concerned with the progressive development of the law of outer space.

III. THE SEARCH FOR A GENUINE CONSENSUS

The exploration and use of outer space is a global problem affecting the entire international community. The Outer Space Treaty recognizes this fact by stressing "the common interest of all mankind" in the exploration and use of outer space for peaceful purposes.[33] From a political legal perspective, this provision provides sufficient legal grounds for claims to full and effective participation by all members of the international community in the decision-making process relating to outer space. Consequently, a realistic policy of space law-making should recognize that viable solutions to outer space issues can be found only through multilateral negotiations that lead to legal regimes of universal scope.

The need to create legal norms acceptable to all interested states has led to the adoption of consensus as a major procedural principle governing space rule-making negotiations. While various negotiating forums emerging as legislative arenas on space issues[34] may have different procedural rules, the central legislative body dealing with space and space activities, the UNCOPUOS,[35] traditionally uses consensus techniques. Consensus rule was adopted by the UNCOPUOS in 1962 and is considered to be a major achievement of this UN body.[36]

As a result, all multilateral treaties relating to outer space elaborated in the framework of the UNCOPUOS[37] were adopted by consensus. Within the UN system there is a widely held belief that consensus rule "appears to result in accelerating the national acceptance of and thus the entry into force of the ultimately promulgated instruments."[38] Specifically, it is often contended that the practice of using

33. Outer Space Treaty, *supra* note 2, Preamble.

34. *See infra* notes 93-99 and accompanying text.

35. For background information on the UNCOPUOS and its Legal and its Scientific and Technical Sub-Committees, see REVIEW OF THE MULTILATERAL TREATY-MAKING PROCESS, *supra* note 1, at 341-48.

36. For details, see Galloway, *Consensus Decisionmaking by the United Nations Committee on the Peaceful Uses of Outer Space*, 7 J. SPACE L. 3 (1979). For an excellent presentation of general problems relating to the notion and practice of consensus techniques in multilateral law-making, see Zemanek, *Majority Rule and Consensus Technique in Law-Making Diplomacy*, in THE STRUCTURE AND PROCESS OF INTERNATIONAL LAW: ESSAYS IN LEGAL PHILOSOPHY, DOCTRINE AND THEORY 857, 871-80 (R. Macdonald, D. Johnston eds. 1983).

37. *See supra* notes 2, 12-15 and accompanying text.

38. REVIEW OF THE MULTILATERAL TREATY-MAKING PROCESS, *supra* note 1, at 19 (state-

consensus technique in the UNCOPUOS "accounts for the wide acceptance of space treaties"[39] or even provides "a guarantee for wide acceptance of the space treaties."[40]

While in the past the consensus technique proved to be quite successful in bringing about general agreement on fundamental principles of space law, recent experience demonstrates that it is increasingly difficult to reach a genuine consensus on new rules. Several subjects pending before the UNCOPUOS, such as the definition and delimitation of outer space, matters relating to the character and utilization of the geostationary orbit and the use of nuclear power sources in outer space have been on the Committee's agenda for many years. While the reasons for the lack of agreement on these items may be different in each particular case, there are general developments which appear to exert a strong influence on the law-making process.

In view of the growing economic value of outer space, an increasing number of states are making use of their right to equal participation in space law-making. As a result, the membership of negotiating forums, especially UNCOPUOS,[41] has expanded. With the arrival of a large number of developing countries into the negotiating process, broad issues relating to the establishment of more equitable international economic relations have gradually surfaced in space law-making.[42]

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ment of the U.N. Secretary General).

39. Jasentuliyana, *Treaty Law and Outer Space: Can the United Nations Play an Effective Role?*, 11 ANNALS AIR & SPACE L. 219, 223 (1986).

40. Lee, *Multilateral Treaty-Making and Negotiation Techniques: An Appraisal*, in CONTEMPORARY PROBLEMS OF INTERNATIONAL LAW: ESSAYS IN HONOUR OF GEORGE SCHWARZENBERGER 157, 167 (1988). *Cf.* U.N. Doc. A/AC.105/PV.203 at 21 (1979) (statement of the U.S. representative made in connection with the adoption of the text of the Moon Treaty: "Consensus may not be the speediest method of work, but it is a method which best ensures that the results achieved by the Outer Space Committee are meaningful and will be generally accepted.").

41. The predecessor of UNCOPUOS, the *ad hoc* Committee on the Peaceful Uses of Outer Space, had eighteen members, G.A. Res. 1348, 13 U.N. GAOR Supp. (No. 18) at 5, U.N. Doc. A/4090 (1958), the first permanent UNCOPUOS had twenty-four members, G.A. Res. 1472, 14 U.N. GAOR Supp. (No. 16) at 5, U.N. Doc. A/4354 (1959), and the present UNCOPUOS has a membership of fifty-three nations, G.A. Res. 35/16, 35 U.N. GAOR Supp. (No. 48) at 88, U.N. Doc. A/35/48 (1980). At present the UNCOPUOS is composed of the following member states: Albania, Argentina, Australia, Austria, Belgium, Benin, Brazil, Bulgaria, Burkina Faso, Cameroon, Canada, Chad, Chile, China, Colombia, Czechoslovakia, Ecuador, Egypt, France, German Democratic Republic, Federal Republic of Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kenya, Lebanon, Mexico, Mongolia, Morocco, Netherlands, Niger, Nigeria, Pakistan, Philippines, Poland, Romania, Sierra Leone, Spain, Sudan, Sweden, Syrian Arab Republic, USSR, United Kingdom, U.S., Uruguay, Venezuela, Viet Nam and Yugoslavia. 43 U.N. GAOR Supp. (No. 20) at 2, U.N. Doc. A/43/20 (1988).

42. For a more detailed discussion of relevant problems, see, e.g., Johnson, *Air and Outer Space Law and the New International Economic Order*, 10 THESAURUS ACROASIUM,

The trend towards discussing space issues from the standpoint of establishing a new international economic order (NIEO) has become particularly evident in connection with the discussions on the status of the natural resources of the moon as the common heritage of mankind.[43] Reflecting the demands of the developing countries, the 1986 Principles Relating to Remote Sensing[44] contain special provisions creating preferential rights for these states.[45] The issue of equitable access to geostationary orbit is also increasingly discussed in terms of the economic benefits and rights of the less developed nations.[46]

The growing emphasis on equity in space is confirmed by the new item on the agenda of the UNCOPUOS relating to the distribution of benefits from space activities, adopted in 1988.[47] During the deliberations on this subject in the UNCOPUOS, the developing states stressed that the Legal Sub-Committee should develop a legal framework "aimed at securing the equitable access of all States to the benefits derived from the use and exploration of outer space . . . [to] eliminate inequalities among States."[48] In support of their position, the developing states cited a number of international instruments which emphasize the need

AIR & OUTER SPACE L. 379 (1981); Vicas, *The New International Economic Order and the Emerging Space Regime*, in SPACE ACTIVITIES AND IMPLICATIONS: WHERE FROM AND WHERE TO AT THE THRESHOLD OF THE 80'S 293 (1981); Danilenko, *The Progressive Development of Space Law: New Opportunities and Restraints*, in SPACE LAW: VIEWS OF THE FUTURE 100, 100-05 (1988).

43. During the negotiations on the legal regime for exploitation of lunar resources on the basis of the common heritage of mankind concept, a number of developing countries expressly stated that they regarded these negotiations as a important step in the establishment of a NIEO. *See, e.g.*, U.N. Doc. A/AC.105/PV.171 at 68 (1977) (statement of the representative of Venezuela); U.N. Doc. A/AC.105/PV.172 at 26 (1977) (statement of the representative of Brazil); U.N. Doc. A/AC.105/C.2/SR.291 at 6 (1978) (statement of the representative of Colombia).

44. *See supra* note 29.

45. Thus, according to Principle XII, the sensed state shall have access to the available analyzed remote sensing information concerning the territory under its jurisdiction in the possession of any state participating in remote sensing activities on "reasonable cost terms" but "taking particularly into account the needs and interests of the developing countries." *Id.*. *Cf. id.* Principles II, IX, XIII.

46. It is significant to note that art. 33 of the 1982 ITU Convention, *supra* note 20, provides that all countries should have equitable access to radio frequencies and the geostationary satellite orbit, "taking into account the special needs of the developing countries." This language is also used in different proposals relating to the definition of the notion of equitable access to the geostationary orbit currently under discussion in the UNCOPUOS. *See* U.N. Doc. A/AC.105/430 at 33-37 (1989).

47. *See* 43 U.N. GAOR Supp. (No. 20) at 16, U.N. Doc. A/43/20 (1988). The new item for the UNCOPUOS agenda deals with "[c]onsideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all states, taking into particular account the needs of developing countries." *Id.*

48. U.N. Doc. A/AC.105/430 at 11 (1989).

for accelerating the economic development of the developing countries, such as the UN Declaration on the Establishment of a New International Economic Order[49] and the Charter of Economic Rights and Duties of States.[50]

The increase in membership of the negotiating forums and the emergence of NIEO problems create additional difficulties in reaching substantive consensus on new legal rules, because they place space issues in a confrontational context where the positions of different groups of states are radically opposed. The search for consensus tends to result in settling on the lowest common denominator, so as not to prejudice the positions of the states involved. Such a consensus often serves only as a disguise for continued disagreement. The disputes over the meaning of the common heritage of mankind principle incorporated into Article 11 of the Moon Treaty[51] illustrate this trend. Reservations expressed by a number of states in connection with the adoption of the 1986 Principles Relating to Remote Sensing[52] indicate strongly the difficulties in reaching

49. G.A. Res. 3201, 5-VI U.N. GAOR Supp. (No. 1) at 3, U.N. Doc. A/9559 (1974).

50. G.A. Res. 3281, 29 U.N. GAOR Supp. (No. 31) at 50, U.N. Doc. A/9631 (1974).

51. *Supra* note 15. According to art. 11, para. 1 of the Moon Treaty, "the Moon and its natural resources are the common heritage of mankind." *Id.* Art. 11, para. 5 provides that "States Parties to this Agreement hereby undertake to establish an international régime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible." *Id.* The radically opposed interpretations of these provisions indicate the absence of common intent. The major controversy relates to the question of whether art. 11 establishes a moratorium on lunar mining. During the negotiations on the Moon Treaty, a claim was put forward that the obligation to establish an international regime amounts to recognition of the moratorium. *See* U.N. Doc. A/AC.105/C.2/SR.249 at 8 (1976) (statement of the representative of Mexico). *Cf.* U.N. Doc. A/AC.105/PV.123 at 6 (1973) (statement of the representative of India); U.N. Doc. A/AC.105/C.2/SR.211 at 26 (1974) (statement of the representative of Iran). Later on this interpretation was supported by a number of writers from the developing countries. *See* Rao, *Common Heritage of Mankind and the Moon Treaty*, 21 INDIAN J. INT'L L. 275 (1981); Sehgal, *The Concept of Common Heritage of Mankind Under the Moon Treaty 1979*, 26 INDIAN J. INT'L L. 106, 112 (1986). This interpretation of art. 11 was rejected, however, by the space powers, particularly the U.S. *See* U.N. Doc. A/AC.105/PV.203 at 22 (1979) (statement of the representative of the U.S.). For conflicting interpretations of the relevant provisions of the Moon Treaty during the Senate hearings, see *The Moon Treaty: Hearings on Agreement Governing the Activities of the States on the Moon and Other Celestial Bodies Before the Subcomm. on Science, Technology, and Space of the Senate Comm. on Commerce, Science, and Transportation*, 96th Cong., 2nd Sess. (1980). For doctrinal discussions, see, e.g., Dula, *Free Enterprise and the Proposed Moon Treaty*, 2 HOUSTON INT'L L.J. 3 (1979); Griffin, *Americans and the Moon Treaty*, 46 J. AIR L. & COM. 729 (1981).

52. *Supra* note 29. The statements of a number of delegations at the final stage of the negotiations on the 1986 Principles Relating to Remote Sensing clearly indicate that despite the fact that formal consensus was reached, serious differences remained in national approaches to a number of fundamental provisions. Thus, although the Principles do not require prior permission of sensed states for remote sensing of their territories, a number of countries continued to maintain that "[s]ensing states should notify and seek

a genuine consensus on issues of economic importance.

The lack of genuine consensus becomes particularly apparent in cases where negotiated legal instruments require ratification. By 1984, the Moon Treaty[53] had been ratified by five states and in accordance with its provisions had entered into force; however, although the Treaty was negotiated by consensus, it had not been ratified by the major space powers.[54] It is beyond dispute that a treaty cannot be effective if it is not ratified by states whose participation is crucial for the implementation of its provisions. The present signatories to the Moon Treaty, who do not possess the necessary technical means to launch objects into outer space and to explore and exploit the resources of the moon, simply do not have the necessary power to bring this legislative project into operation.

The history of the ratification of the Moon Treaty demonstrates that a simple consensus achieved in negotiating forums is insufficient to bring proposed space treaties into effect. This is contrary to the widely-held view that consensus techniques provide a guarantee for the wide acceptance of a space treaty.[55] Indeed, in the framework of multilateral rule-making, negotiations consensus traditionally means no more than the absence of any formal objection to a particular decision. It does not imply the positive support which is necessary for subsequent approval of the treaty by the national bodies responsible for ratification. In the absence of such positive support, consensus may not lead to ratification when each state decides individually whether it is in its best interests to be bound by a particular treaty. The problem becomes especially serious when the states rejecting the treaty are the space powers most directly affected.

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the permission of sensed states before undertaking such activities. . . . Carrying out remote sensing activities without permission [runs] counter to the ideas of international co-operation." U.N. Doc. A/AC.105/SR.290 at 6 (1986) (statement of the representative of Nigeria). *Cf.* U.N. Doc. A/SPC/41/SR.37 at 14 (1986) (statement of the representative of Venezuela); U.N. Doc. A/SPC/41/SR.38 at 2 (1986) (statement of the representative of Turkey); *id.* at 7 (statement of the representative of Algeria). Other states have joined the consensus with serious reservations. Thus, the representative of Yugoslavia stated that "Yugoslavia had joined the consensus, although it had certain reservations concerning the provisions of some principles, particularly those that could be construed as allowing for the possibility of limiting the sovereignty of countries over their natural resources." *Id.* at 10.

53. *Supra* note 15.

54. By 1988 the Moon Treaty had been ratified by Australia, Austria, Chile, the Netherlands, Pakistan, the Philippines and Uruguay. *See Multilateral Treaties Deposited with the Secretary General, Status as at 31 December 1988*, U.N. Doc. ST/LEG/SER.E/7 at 801 (1989).

55. *See supra* notes 38-40 and accompanying text.

Although positive support from the states who are most involved in the relevant space activities is a prerequisite for effective space legislation, such states will remain a small minority in any multilateral negotiating forum in the foreseeable future. This fact inevitably affects the negotiating process, where the majority tends to use its numerical strength by controlling the agenda[56] and by pressing for solutions which satisfy its own interests. Experience in space rule-making indicates that, in extreme situations, the impatient majority may resort to use of the majority vote. The dramatic departure from a previously uninterrupted record of consensus decision-making in connection with the adoption of the 1982 Principles Governing Direct Television Broadcasting illustrates this.[57]

On the official level, consensus decision-making is sometimes criticized by the developing countries as a procedural device impeding progress in space rule-making and creating the undesirable right of veto for dissenting states.[58] Meanwhile, on the doctrinal level, various proposals for majority decision-making are offered as a means of breaking the continued impasse in negotiations on a number of outstanding issues within the framework of the UNCOPUOS. Commentators have suggested, in particular, that "[t]he qualified majority voting rule . . . merits serious consideration, at least in so far as the drafting of international space law agreements by COPUOS is concerned."[59] However, it is doubtful that decisions by majority, even by absolute majority, will lead to viable legal regimes, especially when the outvoted minority includes the states most

56. The developing countries initiated the consideration of a number of key agenda items of the UNCOPUOS. Thus, the first proposal relating to remote sensing was introduced by Argentina. *See* U.N. Doc. A/AC.105/C.2/L.73 (1970). Argentina was also the first country to raise the question of the common heritage of mankind as regards the Moon in a 1970 proposal containing a "draft agreement on the principles governing activities in the use of the natural resources of the Moon and other celestial bodies." U.N. Doc. A/AC.105/C.2/L.71 (1970). The new item on the agenda of the UNCOPUOS relating to the distribution of the benefits derived from space activities, *see supra* note 47, was adopted on the basis of the proposal submitted by the Group of 77. U.N. Doc. A/AC.105/C.2/L.162 (1987).

57. The Principles Governing Direct Television Broadcasting, *supra* note 28, were adopted in the U.N. General Assembly by 107 votes to 13, with 13 abstentions. The U.S. and a number of other Western countries voted against the Principles. *See* 37 U.N. GAOR (100th plen. mtg.) at 1661, U.N. Doc. A/37/PV.100 (1982).

58. Thus, in referring to the continued use of the consensus rule-making techniques by the UNCOPUOS, the representative of Pakistan stated that if there is no tangible progress in the disposal of the pending agenda items the UNCOPUOS may be forced to "consider revising its current working procedures." U.N. Doc. A/AC.105/PV.225 at 6-7 (1981). During the 1989 session of the UNCOPUOS, the representative of Ecuador stated that Ecuador "deplores the fact that the principle of consensus has been turned into the equivalent of the veto." U.N. Doc. A/AC.105/PV.335 at 18-20 (1989).

59. SPACE ACTIVITIES AND EMERGING INTERNATIONAL LAW, *supra* note 25, at 202. *Cf.* Jasentuliyana, *supra* note 39, at 224.

affected by any such decision.

In a situation where the majority is tempted to use its numerical strength, the influential minority may resort to a number of tactics which will eventually frustrate the multilateral law-making process. Diplomatic maneuvering may prevent the inclusion of major new items in the agenda of broad multilateral forums or frustrate meaningful discussion of existing items. Effective law-making may be shifted to specialized bodies dealing with more technical issues. Space powers may rely increasingly on customary processes based on the actual practices and traditional preferences of states whose interests, as the International Court of Justice put it, are "specially affected."[60] Finally, the dissatisfied minority may resort to limited international agreements negotiated within closed state groupings. In view of the unsatisfactory results of the multilateral negotiations on the moon, proposals have already been made that a commercially acceptable legal regime for the exploitation of lunar resources should be elaborated outside the United Nations through agreement between "the space powers potentially capable of exploiting outer space natural resources."[61] From a broader perspective, some commentators contend that "[t]he world community cannot, at this point, meaningfully participate on an egalitarian basis in the initial space law negotiations. It is important that the drafting of space treaties be limited to as few participants as possible in order to conclude workable conventions in a minimum amount of time."[62]

IV. TOWARDS MORE REALISTIC SPACE LAW-MAKING

Given the universal character of space activities, limited agreements among the major space powers regarding outer space probably cannot offer a viable solution to problems calling for essentially global management. At the same time, serious thought should be given to the need to secure the support of the most directly interested states for future space legislation. A realistic assessment of the situation should proceed from the undeniable fact that all states do not have the same level of interest in outer space. While many members of the international community may remain unaffected by a particular decision concerning outer space, others are deeply concerned. Therefore it seems

60. *Cf.* North Sea Continental Shelf Cases (W. Ger. v. Den.; W. Ger. v. Neth.), 1969 I.C.J. 3, 42-43 (Feb. 20, 1969).

61. Smith, *The Commercial Exploitation of Mineral Resources in Outer Space*, in SPACE LAW: VIEWS OF THE FUTURE 45, 54 (1988).

62. de Seife, *Star Wars or Star Peace: The Impact of International Treaties on the Commercial Use of Space*, in I AMERICAN ENTERPRISE, THE LAW AND THE COMMERCIAL USE OF SPACE 73, 108 (1986).

reasonable that the law-making process should reflect the various levels of interest of the space powers and of other states.

Experience demonstrates that the creation of a viable system of space law is impossible without the consent of the major space powers. This fact is recognized on both doctrinal and official levels. Reflecting on international law-making, B. Cheng writes that

> irrespective of the field of international activity in question, what one needs in order that such activity be effectively regulated by given rules of the international legal order, is that those accepting these rules must include what the International Court of Justice in the *North Sea Continental Shelf Cases* called, those states "whose interests are specially affected."[63]

B. Cheng stresses that, as a practical matter, different states do not carry equal weight in the enactment of legal norms, although the principle of sovereign equality of states is formally recognized by international law. He points out that "[t]his weighing of states in the formation of legal norms in the international legal order is . . . demonstrated most dramatically in the field of space law."[64] N. Jasentuliyana writes that "it is obvious that no really viable regime in space can be established without the agreement of the major space powers."[65]

Soviet commentators recognize that regulation of space activities by international law must take into account the interests of all states, regardless of the extent of their participation in the exploration and use of outer space. Nevertheless, G. Zhukov and Y. Kolosov also emphasize that "it would be wrong to underestimate the role of the leading space powers, the USSR and the USA in this context."[66] These authors point out that the "UN activities in working out the rules of international space law depend, to a large extent, on the USSR and the USA acting in concert. Indeed, the principal international agreement on space would hardly have come into being had this been lacking."[67]

C. Q. Christol, an American space law expert, echoed this view: "Past practice suggests, despite the participatory role of many countries in the formation of international space policy and law, generally at the United Nations, that the positions taken by the United States and the Soviet Union have preponderantly influenced the substantive provisions of the resulting legal regime."[68] In expressing this line of thought on

63. Cheng, *The Contribution of Air and Space Law to the Development of International Law*, 39 CURRENT LEGAL PROBS. 181, 190 (1986) (citation omitted). *Cf. supra* note 60.

64. *Id.* at 190.

65. Jasentuliyana, *supra* note 39, at 224.

66. G. ZHUKOV & Y. KOLOSOV, INTERNATIONAL SPACE LAW 17-18 (1984).

67. *Id.* at 18.

68. Christol, *International Space Law, Basic Principles and New Directions*, 9 ANNUAIRE DE DROIT MARITIME ET AERO-SPACIAL 291, 295 (1987).

the official level, the U.S. representative stated in the UNCOPUOS:

> The experience of this Committee, beginning with the Outer Space Treaty of 1967, demonstrates that real progress in the development of legal norms applicable to the use and exploration of outer space can only be made when as many states as possible, *including all states having the capability to engage in outer space activities*, are actively in agreement.[69]

There is no doubt that consensus is and will continue to be the most effective response to the problem of the discrepancy between the power of the numerical majority and influence of the most affected space powers. However, it is also clear that consensus techniques should reflect the political-legal realities of contemporary space law-making. Viewed from this perspective, a major drawback of the present notion and practice of consensus is that it does not guarantee the necessary positive support on the part of the space powers. Therefore, it seems reasonable to suggest a redefinition of consensus to give it a more positive interpretation.

In view of the political realities prevailing in the international community, sweeping procedural reforms are improbable in the near future. It may be difficult to obtain acceptance for the idea that rules of procedure should overtly reflect differences in the power and importance of various states in the decision-making process. For example, it is highly unlikely that a weighted voting rule will be accepted in space law-making diplomacy.[70]

However, as a formal matter, states should carefully consider a qualitative criterion of participation in proposed space treaties, in addition to the quantitative criterion normally used in clauses dealing with the coming into force of treaties. Such a qualitative criterion would ensure that an agreement would take effect only if supported by a sufficient number of the most affected states. More specifically, a rule could be adopted providing that a particular space treaty would come into force only if ratified by a specified number of space powers. In addressing this issue, states could consider different criteria to identify the required qualitative representation, for instance, the level of investment

69. U.N. Doc. A/AC.105/PV.249 at 34-35 (1983) (emphasis added).

70. *Cf.* SPACE ACTIVITIES AND EMERGING INTERNATIONAL LAW, *supra* note 25, at 202 ("Within the United Nations, the one nation-one vote system has become an almost sacrosanct principle").

in the exploration and use of outer space[71] or the number of space launchings per year.[72]

There are precedents where states have expressly recognized that ratification by specified states, who are in the position to effectively implement the agreed rules, is a necessary precondition for the entry of a particular treaty into force. Thus the Outer Space Treaty provides that it will come into force only if ratified by three depository governments, namely the USSR, the UK and the USA.[73] A similar provision was included in the Agreement on the Rescue of Astronauts.[74] The Partial Nuclear Test Ban Treaty provides that it will take effect only if three leading nuclear powers, the USSR, the UK and the USA, ratify it.[75] There is also a well-established trend towards requiring qualitative participation in treaties elaborated in the framework of the International Maritime Organization. Thus treaties relating to shipping[76] include requirements, not only in terms of a fixed number of states, but also of the amount of shipping tonnage they must possess.

The proposed approach would guarantee that, after coming into force, new space treaties would substantially control the subject-matter covered by their provisions. Undesirable situations would be precluded, such as those which have arisen with the Moon Treaty.[77] Moreover, adoption of the proposed rule would also affect the negotiating process and the nature of the consensus emerging from such negotiations. The tested consensus procedure would lead to more realistic normative results and, therefore, more viable legal regimes in the future.

V. ANTICIPATORY REGULATION

International space law is based on anticipatory regulation, which produces rules to govern topics that might arise only in the future. Thus, the 1967 Outer Space Treaty[78] contains a number of provisions

71. *See, e.g., 1987 Civil Space Budgets*, AVIATION WEEK & SPACE TECH., Sept. 5, 1988, at 55; UNESCO, STATISTICAL YEARBOOK 1988 5-84 (1988) (table 5.15); ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, THE SPACE INDUSTRY: TRADE RELATED ISSUES 36-37 (1985).

72. *See, e.g.*, HOUSE SUBCOMM. ON SPACE SCIENCE AND APPLICATIONS, SPACE ACTIVITIES OF THE UNITED STATES, SOVIET UNION, AND OTHER LAUNCHING COUNTRIES: 1957-1987, 100th Cong., 2nd Sess. 2 (1988) (published annually).

73. Outer Space Treaty, *supra* note 2, art. XIV, paras. 2-3.

74. Agreement on the Rescue of Astronauts, *supra* note 12, art. 7, paras. 2-3.

75. Partial Nuclear Test Ban Treaty, *supra* note 18, art. III, para. 2.

76. *See, e.g., The 1974 Convention on a Code of Conduct for Linear Conferences*, 13 INT'L LEGAL MATERIALS 910 (1974). *Cf.* The 1986 U.N. Convention on Conditions for Registration of Ships, U.N. Doc. TD/RS/Conf/23 (1986).

77. *See supra* note 54 and accompanying text.

78. *Supra* note 2.

dealing with situations and issues which not only were unlikely to arise in actual practice at the time when the Treaty was concluded but which are also unlikely today. The Moon Treaty[79] was negotiated at a time when the activities of states in the exploration and exploitation of the natural resources of the moon were very limited. However, these treaties were negotiated and signed when the economic benefits stemming from space exploration and technology were not as readily apparent as they are today. Subsequent experience indicates that anticipatory regulation may be less appropriate in the formulation of detailed policies regarding complex technical and economic issues.

The tendency to formulate space law ahead of progress in science and technology and well before the emergence of actual state practice is often cited as the principal reason for earlier successes in space law-making. In particular, commentators contend that it is easier to conduct negotiations and to reach compromises before the issues under discussion have acquired practical importance and states have fully realized their particular national interests. K. -H. Böckstiegel, for example, writes:

> [F]or the development of space law in general, it was a good thing that in the early days states and their representatives seemed not so much aware of the political, military and economic interests involved in space activities. Otherwise, the Outer Space Treaty at least would probably not have been so successful in achieving its wide scope of applicability or in being ratified by all major space states.[80]

Observers often argue that, at an early stage of negotiations, negotiating states proceed, not from national, but from common interest.[81] From a broader theoretical perspective, many would contend that anticipatory regulation is the most appropriate method to deal with technological and scientific problems.[82] Especially with respect to space law, there is wide

79. *Supra* note 15.

80. Böckstiegel, *supra* note 26, at 179. *Cf.* Böckstiegel, *Prospects of Future Development in the Law of Outer Space*, 8 ANNALS OF AIR & SPACE L. 305, 308-309 (1983); *Treaty Law and Outer Space: The Role of the United Nations*, PROCEEDINGS OF THE 80TH ANNUAL MEETING OF THE AMERICAN SOCIETY OF INTERNATIONAL LAW 381 (1986) (remarks by John E. O'Brien).

81. *See, e.g.*, Webber, *Extraterrestrial Law on the Final Frontier: A Regime to Govern the Development of Celestial Body Resources*, 71 GEO. L.J. 1427, 1450-51 (1983).

82. *See, e.g.*, Schachter, *Scientific Advances and International Law Making*, 55 CALIF. L. REV. 423, 425 (1967). *But cf.* Gotlieb, *The Impact of Technology on the Development of Contemporary International Law*, 170 RECUEIL DES COURS 115, 149, 154 (1981); Slouka, *International Law-Making: A View From Technology*, in LAW-MAKING IN THE GLOBAL COMMUNITY 131, 150 (N. Onuf ed. 1982); Charney, *Technology and International Negotiations*, 76 AM. J. INT'L L. 78, 84-89 (1982).

support for the view that early negotiations are one of the major preconditions for success in space law-making.[83]

Active participation in discussions relating to space issues of a cognitive nature does not necessarily presuppose practical experience in space exploration and research. Thus it is clear that, from a political-legal perspective, the anticipatory approach provides states lacking space capabilities better opportunities for an increased role in law-making. Furthermore, the anticipatory approach prevents unfavorable developments in actual practice which may be relied upon by space powers in order to establish effective patterns of behavior reflecting their preferences. In view of this, it is not surprising that, at the official level, the major proponents of early negotiations on space issues are the developing countries who feel that preventative regulation enables them to exert a greater influence on the law-making process.[84]

However, while anticipatory regulation may be useful for the establishment of a broad legal framework for future space activities, it is dangerous to rely on it too heavily in cases which require detailed regulation of complex technical or economic issues. Early negotiations are usually carried out without substantial knowledge about the subject-matter under discussion. As a result, the law-makers are forced to conduct negotiations based on a number of assumptions about future technological developments, trends in practice and resulting national interests.

Experience indicates that it is extremely difficult to foresee the content and impact of these and other factors on international relations. There is a substantial risk that the proposed normative solutions may be unworkable from both the technical and political points of view. The resulting conflict between practical requirements and the negotiated legal rules will inevitably have an adverse effect on emerging space activities.[85]

The tension between the pressure for anticipatory normative solutions and the dangers of premature regulation became particularly evident in the course of negotiations relating to the legal regime governing the exploitation of the natural resources of the moon. The majority of

83. *See* Zwaan, *The Influence of the Achievements and Failures of the Past on the Future of Outer Space Law*, in SPACE LAW: VIEWS OF THE FUTURE 33, 37 (1988).

84. Stressing the fact that all the rules formulated with regard to outer space have been anticipatory, the representative of Chile in the UNCOPUOS stated: "There could be no doubt that only by a process of anticipation was it possible to draft rules of international law." U.N. Doc. A/AC.105/C.2/SR.501 at 10 (1988). *Cf.* U.N. Doc. A/AC.106/PV.332 at 43 (1989) (statement of the representative of Malaysia on behalf of the Group of 77).

85. *See generally*, Charney, *supra* note 82.

negotiating states supported the idea of an early normative response to future problems. Other countries, including those specially affected, tried to point out that, at the current stage of development of moon exploration, there were no material prerequisites for the detailed regulation of relevant issues. The Soviet representative in the Legal Sub-Committee of the UNCOPUOS emphasized that only

> practical experience in the use of the resources of celestial bodies would make it possible to formulate well-founded normative provisions to regulate that aspect of space activity. Otherwise, there [is] a danger that legal norms lacking any practical value might be adopted, norms that would have no relationship to the real tasks and trends of moon exploration and would therefore hamper rather than stimulate that activity, thus having a retrogressive effect.[86]

Notwithstanding claims to the contrary, actual experience does not support the view that early negotiations make the success of an agreement more likely. In the absence of adequate information about emerging space activities, states may put forward extreme and unrealistic demands. Such demands are usually modified only under pressure of reality.

Thus, a number of developing countries expressed serious concerns about the possible negative consequences of unrestricted remote sensing of their territories and the free dissemination of satellite data concerning their natural resources. These countries believed that developed states could use satellite technology to acquire detailed information about natural resources, which they would exploit to the detriment of the national economic interests of developing countries. These countries feared that technologically advanced countries would interfere with "national rights with respect to their territories and national resources."[87] These concerns were reflected in negotiating proposals aimed at introducing serious restrictions on remote sensing of foreign territories and dissemination of data.[88] In particular, the developing countries stressed that,

86. U.N. Doc. A/AC.105/C.2/SR.226-245 at 8 (1975). At a later stage in the negotiations relating to the moon, the Soviet representative in the UNCOPUOS expressed a similar approach in the following manner:

> [A]t this experimental stage in the conquest and exploration of the moon, when we do not have sufficient bases to affirm that indeed there are natural resources there, resources that might be used on earth, and when we do not have sufficient well-founded technical and economic calculations indicating that the mining of such minerals and their return to earth will be economically feasible and advisable in the future. Under these conditions it is a bit early for the treaty text to reflect such provisions in such striking terms.
>
> We do not want the Committee to draft the kind of document that would for many years to come remain just a fantastic story on a legal theme.

U.N. Doc. A/AC.105/PV.185 at 21 (1978).

87. *Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space*, U.N. Doc. A/Conf.101/10 at 124 (1982).

88. *See, e.g., Treaty on Remote Sensing of Natural Resources by Means of Space Technology—Draft Basic Articles*, U.N. Doc. A/C.1/1047 (1974) [hereinafter *Draft Treaty*

before engaging in remote sensing activities of natural resources of foreign countries, the sensing states should obtain prior permission of the sensed states.[89]

However, actual practice has shown that these early concerns were largely exaggerated. No harm has resulted from free remote sensing of foreign territories and dissemination of satellite data. The realization of this fact was a major factor influencing the final stage of negotiations on remote sensing[90] and contributing to the subsequent compromises reflected in the 1986 Principles Relating to Remote Sensing.[91]

Doubts about the appropriateness and extent of anticipatory regulation may also reduce the chances of early ratification of treaties which use the anticipatory approach. Many states failed to ratify the Moon Treaty because they felt that it was premature. Indeed, one can hardly claim that there is pressing need to adopt legal rules at this stage which purport to govern mining activities on the moon and other celestial bodies.[92] Such activities will take place only in the very distant future.

VI. PROLIFERATION OF NEGOTIATING FORUMS

The growing diversity of space-related activities means that relevant legal issues may arise in many different international forums. Space law-making is no longer restricted to the UNCOPUOS, although this remains the principal UN body concerned exclusively with legal questions arising from the exploration and use of outer space. It is becoming increasingly necessary to coordinate the law-making in these different forums to eliminate undesirable discrepancies.

Questions relating to the use of satellites for direct television broadcasting have been dealt with not only in the framework of the UNCOPUOS but also in the UN Educational, Scientific and Cultural Organization (UNESCO), which in 1972 adopted a Declaration of Guiding Principles on the Use of Satellite Broadcasting for the Free Flow of Information, the Spread of Education and Greater Cultural Exchange.[93]

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on Remote Sensing of Natural Resources] (submitted to the First Committee of the U.N. General Assembly by Argentina and Brazil). For details, see Cocca, *Remote Sensing of Natural Resources by Means of Space Technology: A Latin American Point of View*, in LEGAL IMPLICATIONS OF REMOTE SENSING FROM OUTER SPACE 63 (1976).

89. *See Draft Treaty on Remote Sensing of Natural Resources, supra* note 88, art. V.

90. Before the final approval of the text of the Principles Relating to Remote Sensing, the representative of Colombia in the Special Political Committee of the U.N. General Assembly had to admit that it was the "technological and commercial reality" which, in his words, "played a decisive influence during the final negotiations." U.N. Doc. A/SPC/41/SR.38 at 6 (1986).

91. *Supra* note 29.

92. *Cf.* Rosenfield, *A Moon Treaty? Yes, But Why Now?*, in PROCEEDINGS OF THE TWENTY-THIRD COLLOQUIUM ON THE LAW OF OUTER SPACE 69, 71 (1980).

93. U.N. Doc. A/AC.105/109 (1973).

The International Telecommunications Union (ITU) addresses issues pertaining to the geostationary orbit for space communications. The ITU has become a major forum for the development of international space law, though it remains a technical body. Recently, the ITU's World Administrative Radio Conference (WARC) on the Use of the Geostationary Orbit established a new regulatory regime for satellite telecommunications which are the primary commercial use of outer space.[94]

Other forums also play an important role in space law-making. Matters concerning the prevention of an arms race in outer space are being discussed in the framework of the Conference on Disarmament.[95] Specific amendments to the Outer Space Treaty have been submitted in this forum.[96] Important norms governing the early notification of nuclear accidents on space objects were adopted in 1986 by the General Conference of the International Atomic Energy Agency (IAEA).[97] Issues of international liability for damage caused by space objects have played a certain role in the deliberations of the UN International Law Commission on the topic of international liability for injurious consequences arising out of acts not prohibited by international law.[98] Experience indi-

94. For a detailed discussion of relevant problems, see Doyle, *Space Law and the Geostationary Orbit: The ITU's WARC-ORB 85-88 Concluded*, 17 J. SPACE L. 13 (1989); Doyle, *Regulating the Geostationary Orbit: ITU's WARC-ORB — '85-'88*, 15 J. SPACE L. 1 (1987); Smith, *The Space WARC Concludes*, 83 AM. J. INT'L L. 596 (1989); Smith, *Space Law/Space WARC: An Analysis of the Space Law Issues Raised at the 1985 ITU World Administrative Radio Conference on the Geostationary Orbit*, 8 HOUSTON J. INT'L L. 227 (1986).

95. *See Report of the Conference on Disarmament*, 43 U.N. GAOR Supp. (No. 27) at 213-28, U.N. Doc. A/43/27 (1988).

96. *See, e.g., Proposed Amendment to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, U.N. Doc. CD/851 (1988) (submitted by Venezuela).

97. *International Atomic Energy Agency: Conventions on Nuclear Accidents*, 25 INT'L LEGAL MATERIALS 1369-1376 (1986). For details, see Terekhov, *The 1986 IAEA Conventions on Nuclear Accidents and the Consideration of the Use of Nuclear Power Sources in Outer Space in the Legal Sub-Committee of COPUOS*, PROCEEDINGS OF THE THIRTEENTH COLLOQUIUM ON THE LAW OF OUTER SPACE 403 (1987).

98. In considering problems relevant to this topic, the special Rapporteurs of the International Law Commission often rely on the provisions on absolute liability contained in the 1972 Convention on International Liability for Damage Caused by Space Objects. *Supra* note 13, art. II. *See* Quentin-Baxter, *Preliminary Report on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, [1980] 2 Y.B. INT'L L. COMM'N 254, U.N. Doc. A/CN.4/SER.A/1980; Barboza, *Second Report on International Liability for Injurious Consequences Arising Out of Acts not Prohibited by International Law*, [1986] 2 Y.B. INT'L L. COMM'N 156, U.N. Doc. A/CN.4/SER.A/1986. See also the references to "spacecraft in outer space" and to "spaceship" in the fourth report on this topic, Barboza, *Fourth Report on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, U.N. Doc. A/CN.4/413 at 20, 22 (1988).

cates that with the diversification of space activities, attempts at space legislation may be made in many different law-making arenas.[99]

While the recent trend towards proliferation of space negotiating forums is primarily caused by the growing diversity of topics under discussion, political considerations also play an important part in this process. Difficulties in reaching consensus in broad multilateral bodies, especially in the UNCOPUOS, create pressure to transfer space negotiations to other institutions which are regarded as more suitable for dealing with a particular issue. In this connection, states take into account differences in the composition, decision-making procedures, working methods and other characteristics of various forums, influencing the outcome of negotiations. Specialized institutions dealing with technical issues are generally regarded as more responsive to the preferences of the states most involved in relevant activities.

Arguments relating to competence may impose limits to diplomatic maneuvering aimed at shifting space law-making from broad forums to specialized institutions. For example, as a formal matter, the ITU deals only with the allocation of orbital positions for space communication.[100] Consequently, its mandate does not allow it to regulate other possible uses of the geostationary orbit. Therefore, it is not surprising that the first session of the World Administrative Radio Conference on the Use of the Geostationary Orbit, convened by the ITU, declared itself not competent to deal with broad political and legal issues relating to the claims of sovereignty or jurisdiction over the segments of the orbit.[101]

However, experience indicates, that even partial solutions adopted by specialized institutions affect discussions on broader issues. An analysis of negotiations in the framework of the UNCOPUOS shows that technical regulations established by the ITU tend to exert a strong *de facto* influence on negotiations regarding the general rules of space law governing the same matters. Thus, in approaching the much-debated issue of direct broadcast satellites[102] from a technical

99. Illustrating this trend are the proposals of the Group of 77 to adopt rules regulating marine remote sensing by satellites at the Third United Nations Conference on the Law of the Sea. For details, see Danilenko, *Space Technology and Marine Scientific Research*, 12 MARINE POL'Y 247, 250-51 (1988).

100. *See generally* Jakhu, *The Evolution of the ITU's Regulatory Regime Governing Space Radiocommunication Services and the Geostationary Satellite Orbit*, 8 ANNALS AIR & SPACE L. 381 (1983).

101. *See* U.N. Doc. A/AC.105/360 (1985) (letter from the Secretary General of the ITU to the Secretary General of the United Nations, Oct. 16, 1985).

102. For a detailed analysis of relevant problems, see, e.g., K.M. QUEENEY, DIRECT BROADCAST SATELLITES AND THE UNITED NATIONS (1978); S.F. LUTHER, THE UNITED STATES AND THE DIRECT BROADCAST SATELLITE (1988); G. ZHUKOV & Y. KOLOSOV, *supra* note 66, at 127-36.

perspective, the ITU adopted technical regulations requiring an agreement between interested countries for satellite broadcasts.[103] During the negotiations on the question of direct broadcast satellites in the framework of the UNCOPUOS, the technical regulations issued by the ITU were cited by a number of countries in support for the proposition that the ITU rules had in effect established prior consent as a principle of international law.[104] The tendency to use the ITU technical rules in debates over general principles is also confirmed by the recent UNCOPUOS discussions concerning the proposed general definition of the concept of "equitable access" to the geostationary orbit.[105]

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103. For details, see *XVIIth Report by the International Telecommunication Union on Telecommunication and the Peaceful Uses of Outer Space*, U.N. Doc. A/AC.105/213 at 6-7 (1977). For a description of the ITU regulations, see also *Technical and Legal Implications of the Results of the World Administrative Radio Conference (1977) of the International Telecommunication Union (ITU)*, U.N. Doc. A/AC.105/196, Annex IV (1977) (working paper submitted by the United Kingdom to the UNCOPUOS).

104. Countries favoring the prior consent rule contended, in particular, that the ITU regulations "reflect broad international recognition that direct television broadcasting should be based solely on prior agreements between the interested states, and thus confirm the necessity for a principle on consultation and agreements." U.N. Doc. A/AC.105/196, Annex II at 1 (1977) (report of the Chairman of Working Group II). For a similar argument on the doctrinal level, *see* Chapman & Warren, *Direct Broadcast Satellites: The ITU, U.N. and the Real World!*, 4 ANNALS AIR & SPACE L. 413-32 (1979). For a contrary view, see the statement of the U.S. representative to the Legal Sub-Committee of the Committee on the Peaceful Uses of Outer Space (Mar. 14, 1979), U.N. Doc. A/AC.105/C.2/SR.304 at 8 (1979).

105. According to art. 33 of the ITU Convention, *supra* note 20, "radio frequencies and the geostationary satellite orbit are limited natural resources" which must be "used efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or group of countries may have equitable access to both, taking into account the special needs of the developing countries and the geographical situation of particular countries." In 1988 "friends of the Chairman" of the Working Group on the geostationary orbit of the Legal Sub-Committee of the UNCOPUOS proposed the following definition of the concept of equitable access to the geostationary orbit:

> All states should be guaranteed in practice equitable access to the geostationary orbit in accordance with articles 10 and 33 of the Nairobi ITU Convention. The geostationary orbit should be used most efficiently and economically. Special needs of the developing countries and the geographical situation of particular countries should be taken into account when guaranteeing in practice equitable access to the geostationary orbit.

U.N. Doc. A/AC.105/411 at 33 (1988).

In 1989, a number of countries, members of the Group of 77, submitted at the meeting of the Working Group a "working non-paper" which contained the following provision:

> All states should be guaranteed in practice equitable access to the geostationary orbit in accordance with articles 10 and 33 of the Nairobi ITU Convention. The geostationary orbit should be used most efficiently and economically. Special needs of the developing countries and the geographical situation of particular countries, such as the equatorial countries, should be taken into account when guaranteeing in practice the equitable access to the geostationary orbit.

Question of the Geostationary Orbit, U.N. Doc. A/AC.105/430, Annex II at 34 (1989).

The subsequent exchange of views on this provision has indicated that many delegations used the wording of art. 33 of the ITU Convention as a major argument in assess-

From a legal policy perspective, it is clear that the recent proliferation of negotiating forums requires greater coherence and coordination of law-making activities at national and international levels. Lack of coordination at the national level results in inconsistent positions being taken by delegations from the same state in various international bodies.[106] If there is no coordination at the international level, different legislative bodies may adopt conflicting rules on the same issue. Thus, both the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency adopted by the IAEA[107] contain rules on nuclear power sources on space objects relating to notification and assistance which conflict with the relevant provisions of the Draft Principles Relevant to the Use of Nuclear Power Sources in Outer Space currently under discussion in the UNCOPUOS.[108] Policy considerations relating to the need for a coherent body of space law clearly require a careful comparative study of the provisions of the 1986 IAEA Conventions and the UNCOPUOS Draft Principles[109] with a view to eliminating the undesirable discrepancies.[110]

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ing the acceptability of the proposed general definition. In particular, it was stated that "although the above formulation was evidently based on article 33 of the ITU Convention, it deviated without adequate justification from the language used in that article," *id.* at 34, that "the above formulation went far beyond article 33 of the ITU Convention," *id.*, or that "this formulation departed significantly from the relevant wording of article 33" by using, in particular, such expressions as "in practice" and "such as the equatorial countries," *id.* at 34, 36.

106. It is clear now that, as S. Danielsson put it, "governments wishing to formulate a coherent policy for the regulation of outer space activities have to follow developments in different places." Danielsson, *An Interdisciplinary Approach in the Regulation by the United Nations of Activities in Outer Space: Some Technical Considerations*, in SPACE ACTIVITIES AND IMPLICATIONS: WHERE FROM AND WHERE TO AT THE THRESHOLD OF THE 80'S 99, 117 (1981). Experience indicates, however, that this is not always the case. Thus, in commenting on the negotiations concerning direct broadcast satellites (DBS), J.H. Chapman and G.I. Warren write: "recent history has shown that officials dealing with DBS in one forum have been only superficially aware of DBS developments in other foa [sic]." Chapman & Warren, *supra* note 103, at 416.

107. *See supra* note 97.

108. For details, see Terekhov, *supra* note 97, at 403-10.

109. During the discussions on the Draft Principles Relevant to the Use of Nuclear Power Sources in Outer Space in the UNCOPUOS, the representative of China referred to suggestions in the previous session to conduct "a comparative study" of the Draft Principles with the IAEA Conventions. *See* U.N. Doc. A/AC.105/C.2/SR.482 at 2 (1988).

110. During the 1988 session of the UNCOPUOS, the Soviet representative drew "attention to the need for the principles we are drafting to accord with the provisions of the two IAEA Conventions of 1986." U.N. Doc. A/AC.105/PV.318 at 58 (1988). In 1989 the Soviet representative stated again:

> The draft principles needed to be brought into line with the Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nu-

From a political-legal perspective, it is clear that the lack of coordination between different negotiating forums endangers the unity and coherence of space law. There is no doubt that the existence of conflicting rules in different instruments on the same issues could create serious legal and practical problems for the interpretation and implementation of space treaties and other relevant international instruments. In view of the increasing danger to the unity of space law, serious thought should be given to the need for elaborating a coherent space legislative policy.

One of the results of the recent UN review of the multilateral treaty-making process[111] is the recognition of the need for continuous gathering and dissemination of data relating to treaty-making activities of different bodies within the UN system. In view of this general trend, it is reasonable to expect an increase in the role of the UN General Assembly and of the UNCOPUOS in promoting greater coherence of space legislative efforts. As a technical matter, the UNCOPUOS lacks the necessary authority to coordinate the space law-making of different forums, in particular international organizations. Nevertheless, it can obviously increase its efforts in the gathering and dissemination of information about international rule-making relating to outer space and space activities. The time may also have come for it to undertake a review covering the activities of different international organizations engaged in multilateral space treaty-making with a view to improving the existing legislative techniques.

VII. FRAGMENTATION OF THE LEGAL REGIME

Lack of coordination among different legislative bodies is not the only factor leading to the fragmentation of the legal regime applicable to space activities. Due to a variety of factors, the unity and coherence of space law may also be endangered by conflicting provisions elaborated in the same negotiating forum. Thus, the change in composition of the UNCOPUOS affects the results of negotiations in this legislative body.

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clear Accident or Radiological Emergency, which were adopted by IAEA in 1986. Those conventions fully applied to situations involving the use of nuclear power sources in outer space.

U.N. Doc. A/AC.105/C.2/SR.507 at 5 (1989). In evaluating the proposed principles on notification and assistance, the representative of Canada emphasized that his delegation has not "lost sight of the problem of the relationship between them and the relevant IAEA conventions. . . . " U.N. Doc. A/AC.105/C.2/SR.481 at 3 (1988). *Cf.* U.N. Doc. A/AC.105/C.2/SR.484 at 2 (1988) (statements of the representative of Czechoslovakia); U.N. Doc. A/AC.105/C.2/SR.485 at 3 (1988) (statements of the representative of Bulgaria).

111. *See* REVIEW OF THE MULTILATERAL TREATY-MAKING PROCESS, *supra* note 1.

For example, both the Outer Space Treaty[112] and the Moon Treaty[113] were adopted in the framework of the UNCOPUOS. However, states parties to these treaties assumed different obligations in a number of areas.

A comparative analysis of Article IX of the Outer Space Treaty and of Article 7 of the Moon Treaty indicates that the content of the obligations relating to the protection of the earth and space environments imposed by these treaties is different. Regarding outer space, Article IX of the Outer Space Treaty expressly limits the relevant environmental obligations to activities relating to the "study" and "exploration" of outer space.[114] Other types of space activities, including such environmentally significant activities as the exploitation of the resources of outer space, do not seem to fall within the purview of Article IX.[115] With respect to the earth, Article IX requires only the avoidance of environmental hazards relating to the possible introduction of extraterrestrial matter.[116] It does not contain a general environmental obligation applicable to all space activities. In contrast, the environmental protection rules of the Moon Treaty cover all possible kinds of adverse effects on the moon's environment, as well as the earth's, which may result from activities associated with the exploration and use of the moon and other celestial bodies.[117]

Another important area is the exploitation of the natural resources of outer space. While the Outer Space Treaty proclaims freedom in the use of outer space,[118] which, as generally recognized, includes the freedom to exploit its resources,[119] the Moon Treaty is regarded by many as imposing a moratorium on exploitation of the resources of the moon and

112. *Supra* note 2.

113. *Supra* note 15.

114. *See* Outer Space Treaty, *supra* note 2, art. IX. The pertinent provision of art. IX reads: "States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter." *Id.*

115. *Id.*

116. *Id.*

117. *See* Moon Treaty, *supra* note 15, art. 7. Art. 7 reads:

> In exploring and using the Moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment, whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to avoid harmfully affecting the environment of the Earth through the introduction of extraterrestrial matter or otherwise.

Id.

118. *See* Outer Space Treaty, *supra* note 2, art. I.

119. *See, e.g.*, C.Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 39-42 (1982).

other celestial bodies.[120] Even if there is no moratorium, the parties to the Moon Treaty have assumed a number of specific obligations relating to the exploitation of lunar resources, which are absent from the Outer Space Treaty. These include, in particular, obligations relating to "[t]he orderly and safe development of the natural resources of the moon," "[t]he rational management of those resources," "[t]he expansion of opportunities in the use of those resources," and "[a]n equitable sharing by all States Parties in the benefits derived from those resources. . . ."[121]

Furthermore, according to Article 11 of the Moon Treaty, the parties have an obligation to establish an "international regime" to govern the exploitation of the natural resources of the moon.[122] Further fragmentation of the applicable legal regime is possible in this case, too, because not all parties to the Moon Treaty may be able to join the envisioned "international regime." As a result, the exploitation of lunar resources may be governed by the various rules contained in the Outer Space Treaty, the Moon Treaty and the future "international regime" envisioned by the Moon Treaty. This could lead to considerable legal uncertainty and an increased danger of tension and conflicts between different groups of states.

The trend towards fragmentation of the applicable legal regime may intensify if states displaying divergent attitudes on controversial issues resort to limited agreements reflecting their preferences. An indication of this possibility is the regional Convention on the Transfer and Use of Data of the Remote Sensing of the Earth from Outer Space adopted by a group of socialist countries.[123] While the 1986 Principles Relating to Remote Sensing[124] and, arguably, the emerging general customary law allow free dissemination of satellite data,[125] the Convention restricts the dissemination of data with a spatial resolution finer than 50 m.[126]

To some extent, the trend toward fragmentation is limited by the fact that new space treaties generally repeat the general provisions which have already been endorsed by earlier treaties dealing with outer space.[127] Although this legislative technique may raise difficult

120. *See supra* note 51.

121. *See* Moon Treaty, *supra* note 15, art. 11, para. 7.

122. *Id.*, art. 11, para. 5.

123. U.N. Doc. A/33/162 (1978) (The original parties to the Convention were Cuba, Czechoslovakia, the German Democratic Republic, Hungary, Mongolia, Poland, Rumania and the USSR). For details, see G. ZHUKOV & Y. KOLOSOV, *supra* note 66, at 150-51.

124. *See supra* note 29.

125. *Cf. id.*, Principle XII.

126. *See* U.N. Doc. A/33/162 (1978), art. IV.

127. *See supra* notes 2, 12-15 and accompanying text.

questions about the relationship between the obligations created by different instruments, it enables law-makers to establish a legal system in which some basic rules are adopted by states which may not be bound by similar provisions in earlier treaties. As a result, the rules of space law acquire broader community support.

However, inconsistencies and gaps in space law are inevitable as long as the law-making process continues to be limited to the adoption of different conventions dealing with particular space activities. From this perspective, the establishment of a harmonious body of space law requires the codification of space law in a single comprehensive convention governing all space activities.

VIII. A COMPREHENSIVE CONVENTION?

Arguments for a comprehensive space convention governing all uses of outer space usually rely on existing experience in codification. Of particular importance is the Convention of the Law of the Sea, where the UN made serious attempts to establish an all-embracing legal regime for the oceans in a single UN document.[128] The proponents of such an approach to space law-making[129] argue that it will result in a stable and coherent legal regime for outer space promoting international cooperation in its exploration and use.

This proposal may find a certain amount of support not only on the doctrinal but also on the official level, especially among states

128. U.N. Doc. A/Conf.62/122 (1982).

129. *See* Borgese, *United Nations: Future Trends*, in THE ADAPTATION OF STRUCTURES AND METHODS AT THE UNITED NATIONS 373, 382-85 (D. Bardonett ed. 1986) (discussing prospects for the global international space conference, analogous to the Third U.N. Conference on the Law of the Sea, which by relying on comprehensive and systematic approaches may create "one comprehensive system" for disarmament and development in outer space); ST.FRHR. VON WELCK & R. PLATZODER, WELTRAUMRECHT (LAW OF OUTER SPACE) 6 (1987) ("The rapid technological development and the political interest in the exploration and use of outer space require the expansion and further development of existing space law. This may lead to the convening of an international conference in coming years — similar to the Third U.N. Conference on the Law of the Sea — so as to elaborate a regime covering all uses of outer space.") (Translation from German by the author).

Cf. Plant, *The United Nations Conference on the Law of the Sea and the Preparatory Commission: Models for United Nations Law-Making?*, 36 INT'L & COMP. L.Q. 525, 558 (1987). It appears that a well-known Soviet expert on international law in general and on the law of outer space in particular, Y. Kolosov, could also be included among supporters of such an approach. He stated recently that in view of the need for universalization of international law it may be desirable to propose, by analogy with the drafting of the U.N. Convention on the Law of the Sea, "major universal conventions" setting standards of behavior for states "in every sphere of international law and international relations." *International Security and Law*, 4 INT'L AFF. (MOSCOW) 84, 88 (1989) (remarks of Yuri Kolosov).

pressing for a radical reform of existing space law. Relevant political-legal arguments were already being advanced in the 1970s. Thus, the representative of Chile stated: "The 1967 Treaty, which had met the demands of what was essentially a period of exploration, should be superseded by a comprehensive international regime eventually covering the whole of outer space, duly delimited, and all its uses and resources."[130]

In assessing the prospects for future space law-making it is useful to bear in mind that the developing countries tend to rely on international law as an instrument to achieve a more equitable space order. Consequently, they have a strong interest in establishing a comprehensive legal regime for outer space covering all possible aspects of space activities. It is therefore not surprising that some of them are pressing "for a systematic and coherent legal regulation of technological development and the purpose of achieving an equitable distribution of the benefits of the exploration and use of outer space, so as to end the unjust predominance of some countries over the others."[131]

As a technical matter, the proposal to negotiate a comprehensive space convention may be attractive. However, there are grounds to believe that any legislative initiatives in this direction would be premature. Space law is still at an early stage of development. Rapid technological transformations continue to create new political-legal problems which cannot be envisioned at this stage. It appears that the tested method of step-by-step resolution of emerging issues through non-binding instruments which are confirmed, at a later stage, by limited agreements dealing with particular matters is an essential prerequisite for successful law-making. Furthermore, in view of the growing difficulties in achieving consensus in space negotiating forums, genuine consensus on new universal treaty principles may be reached only in carefully defined areas of common concern dealing with specific space activities.

From a policy perspective it is also clear that proposals for a comprehensive space treaty are likely to encounter serious political opposition. Many states, especially those most affected, may feel that comprehensive solutions and global conferences create a political environment highly responsive to numerical majorities. Experience in

130. U.N. Doc. A/AC.105/C.2/SR.247 at 4 (1976).

131. U.N. Doc. A/AC.105/PV.312 at 6 (1988) (statement of the representative of Colombia in the UNCOPUOS). *Cf.* U.N. Doc. A/AC.105/C.2/SR.506 at 10 (1989) (statement of the representative of Argentina: "The main aim of Argentina's policy with regard to the exploration and utilization of outer space was the progressive elaboration of an international legal code which would regulate such activities adequately, taking into account the interests of all countries and, in particular, the needs of the developing countries.").

other areas of law, especially in the law of the sea, indicates that comprehensive negotiations favor states which advance extensive claims in order to obtain a bargaining leverage on the whole range of issues under discussion, even though they have no direct and immediate link to a particular activity.

In the context of negotiations on a limited agenda, extreme positions are unlikely to yield positive results. By contrast, in the framework of comprehensive settlements, states advancing far-reaching claims may easily form special pressure groups and negotiating alliances that multiply their original negotiating strength. Consequently, there is a danger that normative results of negotiations on a comprehensive space convention may not reflect the actual balance of interests of different groups of states as regards the exploration and use of outer space. In particular, space powers may find it difficult to preserve the existing principles of space law, such as the freedom of exploration and use of outer space, which have been criticized by a number of developing countries. Comprehensive negotiations may provide states pressing for radical reforms of the existing space law an ideal opportunity to reopen negotiations on these basic principles of space law which have been codified in the Outer Space Treaty.[132] Other considerations also tend to discourage the movement toward comprehensive law-making. Of principal importance in this connection are, of course, the questions of procedure. It is highly unlikely that the relevant global conference would adopt rules of procedure reflecting the idea that the opinions of those states who are most actively involved in space activities should carry more weight than others.

In space law-making there is also no established tradition of requiring qualitative participation in the proposed space treaties. Consequently, from this perspective it is also reasonable to assume that the

132. *Supra* note 2. It is significant to bear in mind that a number of developing countries express serious criticism of the 1967 Outer Space Treaty. Developing equatorial states claiming sovereignty of the geostationary orbit over their territories contend in the Bogotà Declaration that:

> [The Outer Space Treaty] cannot be considered as a final answer to the problem of the exploration and use of outer space, particularly since the international community is now calling in question all the terms of international law which were drawn up at a time when the developing countries could not count on adequate scientific advice and were thus not able to detect and assess the omissions, contradictions and inconsistencies in the texts, which were prepared with great ability by the industrialized Powers for their own benefit.

Declaration of the First Meeting of Equatorial Countries, December 3, 1976, 6 J. SPACE L. 195 (1978) (English translation) (signed in Bogatà, Columbia by Brazil, Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda and Zaire). *Cf. supra* note 84 and accompanying text (statement of the representative of Chile). There are signs that the position of the equatorial countries regarding the geostationary orbit has found at least partial support from a number of countries members of the Group of 77. *See supra* note 106.

resulting compromises would tend to reflect the preferences of the numerical majority. As a result, there is a substantial risk that the negotiated convention would be resisted by the space powers. In the absence of their support, the envisioned ambitious legislative project might remain a dead letter. Far from achieving the desired coherence in space law, such a development would only destabilize the already existing legal regime for outer space.

IX. CONCLUSION

The international community has successfully promulgated a number of general multilateral instruments establishing a broad legal framework for the uses of outer space. In view of the growing diversity of space activities, especially in the economic field, the need for the development of new legal rules to regulate new space activities has increased. The lack of meaningful progress in negotiations in a number of areas has also intensified the need for improvements in the existing law-making process. In considering possible improvements, states must realize that, in order to be effective, space law-making should increasingly be based on legislative techniques that will reflect the realities of international relations. The future of the space legislative process depends primarily on the ability of the international community to achieve a genuine consensus reflecting both the legitimate common interests of all states in space and the special interests and responsibilities of the space powers in the exploration and use of outer space for the benefit of mankind as a whole.

COMMENT

PATENT PROTECTION FOR THE PROTEIN PRODUCTS OF RECOMBINANT DNA

BY SEAN JOHNSTON †

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† J.D. 1989, Stanford University; Ph.D. Molecular Biology 1985, University of California, Los Angeles; presently a law clerk for Judge Wm. Matthew Byrne, Jr., U.S. District Court, Los Angeles, California.

One of the most significant legal questions now confronting the biotechnology industry is the scope of protection that patents on so-called "first-generation" recombinant proteins will confer vis-a-vis "second-generation" analogs. These second-generation proteins may differ from the first-generation protein by as little as a single amino acid. Case law relating to traditional chemical inventions may give some insight into the approach that the Patent Office and courts will likely take in evaluating the issues of patentability and scope of patent protection for these recombinant protein products.

To the extent that inventors of first-generation recombinant proteins disclose the complete nucleotide sequence of the gene encoding the protein, strong arguments may be made that the invention is a pioneering one, entitled to broad patent protection. At the same time, if the patent system is to continue to serve the goal of promoting the invention of new and useful products, the opportunity to obtain patents on second-generation recombinant proteins must not be foreclosed. The pressing issue is where to draw the boundaries between the respective patent grants to ensure fair protection for everyone.

I. INTRODUCTION

Biotechnology patent law has come a long way from the time when the patentability of recombinant microorganisms was at issue and the Supreme Court's landmark decision in *Diamond v. Chakrabarty*[1] was the focus of attention. Having overcome the initial difficulties in obtaining patent protection for the microorganisms used to produce recombinant proteins, the most significant legal questions now confronting the biotechnology industry concern the patenting of the recombinant protein products themselves. Of particular concern is the patentability of so-called "second-generation" recombinant proteins — analogs that may differ from the first-generation protein by as little a single amino acid — and the scope of protection that the patent on a first-generation recombinant protein will confer vis-a-vis the second-generation analogs.

These issues are of enormous practical importance to the biotechnology industry because of its reliance on patents to secure the economic returns on research and development investments.[2] The inventor of a second-generation recombinant protein seeks patent protection for his invention in order to obtain exclusive rights in the product and the monopoly rents that flow from it. At the same time, the inventor of the corresponding first-generation protein is intent on protecting the rights

1. 447 U.S. 303 (1980).

2. For a general discussion of the economic theory of property rights, see R. POSNER, ECONOMIC ANALYSIS OF THE LAW 28-75 (3d ed. 1986).

and rewards conferred by his patent grant from appropriation by competitive late-comers. The ultimate resolution of the issues concerning patent rights in first- and second-generation recombinant proteins may largely shape the course of future research and development efforts in biotechnology.[3]

A. The Fundamentals of Molecular Biology

In the same way that the advent of semiconductor technology heralded a revolution in electronics, biotechnology has heralded a revolution in the pharmaceutical industry, the results of which are now only beginning to be realized.[4] A recent analyst's report even suggested that existing pharmaceutical firms will evolve into biopharmaceutical firms in the 1990s, thus resulting in the technological, if not financial, acquisition of the pharmaceutical industry by the biotechnology industry.[5]

The business of biotechnology is founded on the science of molecular biology — the study of the genetics of living organisms at the molecular level — and in particular, those methods that characterize recombinant DNA technology.[6] Recombinant DNA techniques make it possible for researchers to move genetic material in a functional form from one organism to another, creating genetic constructs that have never before existed in nature. For instance, the gene that produces a protein such as insulin can be isolated from human cells and inserted into another host cell, such as a bacterium. The bacterium can then be

3. "[T]he basic policy underlying the patent system is to encourage the disclosure of inventions through issuance of patents. Another policy of the system is to stimulate the investment of risk capital in the commercialization of useful patentable inventions so that the public gets some benefit from them, which may not occur in the absence of some patent protection." Rohm and Haas Co. v. Crystal Chemical Co., 722 F.2d 1556, 1571 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). *See also, e.g.*, Kitch, *The Nature and Function of the Patent System*, 20 J. LAW & ECON. 265 (1977); Plant, *The Economic Theory Concerning Patents for Inventions*, 1 ECONOMICA 30 (1934).

4. The first pharmaceutical produced through recombinant DNA technology to be approved by the U.S. Food and Drug Administration (FDA) and to be marketed was human insulin. FDA approval came in October 1982 and commercial sales began shortly thereafter. *As Lilly's Synthetic Insulin Gets FDA OK, Novo, Biogen Join to Clone Their Own*, McGraw Hill's Biotechnology Newswatch, Nov. 15, 1982, at 2; Johnson, *Human Insulin from Recombinant DNA Technology*, 219 SCIENCE 632 (1983). As of 1989, a total of nine biotechnology-based pharmaceuticals have been approved for commercial use by the FDA. Gupta, *Watching and Waiting: Biotechnology Holds Great Promise, but Investors are Still Waiting for the Payoff*, Wall St. J., Nov. 13, 1989, at 32, col. 1.

5. ARTHUR YOUNG HIGH TECHNOLOGY GROUP, *Introduction* to BIOTECH 88: INTO THE MARKETPLACE at 2 (1987).

6. For general references, see K. DRLICA, UNDERSTANDING DNA AND GENE CLONING (1984); J. WATSON, J. TOOZE & D. KURTZ, RECOMBINANT DNA, A SHORT COURSE (1983) [hereinafter J. WATSON]; Gilbert and Villa-Komaroff, *Useful Proteins from Recombinant Bacteria*, SCI. AM., Apr. 1980, at 74.

reproduced or cloned, creating many identical copies of the gene. If the gene can then be coaxed to manufacture the same protein in bacteria that it does in a human cell, large quantities of the protein can be produced for pharmaceutical applications.[7]

The gene that is expressed in the host cell consists of a defined segment of deoxyribonucleic acid (DNA). DNA is the basic hereditary component of all living matter and contains all the information needed to make the organism and carry on its functions, including complete instructions on what proteins to produce.

DNA is itself a duplex molecule—a so-called "double helix"—formed by the annealing of two nucleic acid polymers. Each nucleic acid polymer, or "strand," of the DNA molecule is assembled from chemical building blocks called nucleotides. Each nucleotide contains a phosphate group linked to a sugar molecule which, in turn, is joined to one of the following four chemicals: adenine (A), thymine (T), guanine (G), or cytosine (C). These four chemicals are called "nucleotide bases." The formation of the double-stranded DNA molecule results from the inherent property of nucleic acid polymers to combine with one another through "complementary base pairing," by which an A on one strand becomes "base-paired" with a T on the other strand, and a G with a C.

The specific sequence of the nucleotide bases along a strand of DNA encodes the information necessary to produce a protein.[8] A cell's protein synthesis machinery "reads" the sequence of nucleotide bases in groups of three, called "codons." Each of the 64 possible codons (which constitute all of the possible combinations of triplet base sequences) corresponds to a particular amino acid or acts as a signal to start or stop protein synthesis. Amino acids are the building blocks of proteins. Just as the sequence of codons within a gene specifies the sequence of amino acids in a protein, the sequence of amino acids within the protein

7. *See, e.g.*, Goeddel, Kleid, Bolivar, Heyneker, Yansura, Crea, Hirose, Kraszewski, Itakura & Riggs, *Expression in Escherichia coli of Chemically Synthesized Genes for Human Insulin*, 76 PROC. NAT'L ACAD. SCI. USA 106 (1979); Johnson, *supra* note 4.

Proteins are the basic components of biological structures and processes. Familiar structural proteins include collagen, which forms connective tissues such as cartilage and bone, and keratin, which forms skin and hair. Examples of proteins that carry out biological processes are insulin, which regulates sugar metabolism; Factor VIII, which is needed for blood clotting; and antibodies, which help protect against infection by foreign substances. Given the range of apparent medical uses of proteins, their production in pure quantities has been and continues to be one of the principal objectives of biotechnology.

8. For general references, see 1 J. WATSON, N. HOPKINS, J. ROBERTS, J. STEITZ & A. WEINER, MOLECULAR BIOLOGY OF THE GENE 81-87 (4th ed. 1987); B. LEWIN, GENES 37 (3d ed. 1987).

specifies the physical structure of the protein and its characteristic functional properties.

The production of a desired protein in a foreign host cell requires two basic steps: 1) identifying and isolating the gene encoding the desired protein; and 2) transferring the gene into the host cell. In general, the first step is by far the most difficult.[9] Identifying the gene for a specific protein typically requires that at least a part of the nucleotide sequence of the gene be known. In most cases, this will involve inferring the nucleic acid sequence from the amino acid sequence of the protein. Although the techniques for amino acid sequencing are well known, obtaining a sample of the protein in sufficient quantity and purity for analysis can be quite difficult. Indeed, the decision to produce a protein by the methods of recombinant DNA technology is often motivated by the fact that such limited quantities of the protein are available from natural sources.[10]

Once a portion of the sequence of the gene is determined, a short single-stranded nucleic acid "oligonucleotide" may be synthesized having a nucleotide sequence complementary to the derived genetic sequence. Then that oligonucleotide may be used as a "probe" for isolating the gene from a natural source.[11] Conceptually, the process of using an oligonucleotide probe to isolate a desired gene is analogous to searching for a needle in a haystack. Because of the quantity and complexity of DNA in the cells of living organisms, isolating a single gene entails picking out a specific sequence of hundreds or thousands of nucleotides from amongst a total of perhaps several billion nucleotides.[12] As Philip Leder of Harvard Medical School has described it, "[i]f we took the DNA . . . from a single human cell and laid it out, it would be about one meter in length. If we could stretch that meter into one kilometer, a single gene would be represented in a millimeter's worth of DNA."[13] The individual intent on being the first to express a specific human protein

9. The relative difficulty of identifying and isolating the gene for a desired protein is a consequence of the complexity of the natural environment in which the gene and protein are found. For example, the DNA in each human cell consists of a total of about 3 billion nucleotide base pairs, organized into 100,000 or more individual genes. *See generally*, J. WATSON *supra* note 6.

10. *See* OFF. OF TECH. ASSESSMENT, COMMERCIAL BIOTECHNOLOGY: AN INTERNATIONAL ANALYSIS, U.S. Cong., Pub. No. OTA-BA-218 at 119-136 (1984).

11. *See, e.g.*, Wood, Capon, Simonsen, Eaton, Gitschier, Keyt, Seeburg, Smith, Hollingshead, Wion, Delwart, Tuddenham, Vehar & Lawn, *Expression of Active Human Factor VIII from Recombinant DNA Clones*, 312 NATURE 330, 331-32, 334 (1984) (describing the use of synthetic oligonucleotides to isolate the gene for human Factor VIII).

12. *See supra* note 8.

13. S. OLSON, BIOTECHNOLOGY - AN INDUSTRY COMES OF AGE 16 (1986).

by recombinant DNA technology must locate the correct millimeter along the kilometer course.

B. The Fundamentals of Patent Law

Because of the tremendous investments of labor and capital required to produce "first-generation" recombinant proteins[14] — those resulting from the identification, isolation, and expression of a native cellular gene — it is not surprising that the biotechnology industry has aggressively sought patent protection for its efforts.[15]

To be patented, a product must satisfy the three statutory requirements of utility, novelty, and non-obviousness, found in Title 35 of the United States Code.[16] The utility requirement ensures that the invention is useful for some purpose.[17] To be novel, the invention must be new, so that a patent is not granted for something that already belongs to the public.[18] The non-obviousness requirement extends the novelty requirement and ensures that a person skilled in the relevant art cannot take something in the public domain, make a trivial change in it, and receive a patent for the result.[19]

In the case of a first-generation recombinant protein, utility is a foregone conclusion since the recombinant protein will at least serve the same useful purpose as its naturally occurring counterpart. Furthermore, a first-generation recombinant protein may be considered novel and hence patentable despite the existence of the naturally occurring protein, so long as the recombinant protein exhibits some property lacking in the naturally occurring protein, such as purity or potency.[20] The non-obviousness of a first-generation recombinant protein may be established, for example, by showing the unpredictable nature of the methods used to produce it, or by showing that the protein was not pre-

14. For example, securities analysts estimate that Genentech, Inc. expended over $200 million to bring a recombinant tissue plasminogen activator to market. Bylinsky, *Genentech Has a Golden Goose*, FORTUNE, May 9, 1988, at 52, 62.

15. One measure of importance of patents to the biotechnology industry is the number of biotechnology-related patent applications that are filed. As of September 1988, some 15,000 to 16,000 biotechnology-related patent applications were pending in the U.S. Patent and Trademark Office (PTO), "with more coming in all the time." *New Legal Species Born of Biotech*, Insight, Sept. 19, 1988, at 54-55. Another measure is the frequency of biotechnology-related patent litigation, see Appendix A.

16. 35 U.S.C. §§ 101-103 (1982).

17. 35 U.S.C. § 101 (1982).

18. 35 U.S.C. § 102 (1982).

19. 35 U.S.C. § 103 (1982).

20. *See, e.g., In re* Bergstrom, 427 F.2d 1394, 1401 (C.C.P.A. 1970) (where compound does not exist in nature in pure form, pure compound is patentable).

viously known to exist in nature.[21] Pursuant to this statutory scheme, United States patents have already been granted for a number of first-generation recombinant proteins.[22]

In addition to the statutory requirements of novelty, utility, and non-obviousness, 35 U.S.C. § 112, first paragraph, requires that a patent: (i) provide a written description of the invention; (ii) disclose how to make and use the invention; and (iii) disclose the best mode for carrying out the invention.[23] As a means of complying with the enablement and best mode requirements, the patent on a first-generation recombinant protein will typically disclose the complete nucleotide sequence of the gene used to produce the protein.[24]

For the patentee, obtaining the nucleotide sequence of the isolated gene is straightforward and involves routine methodologies. However, in the hands of a competitor, such information is of incalculable value. Not only does the sequence information teach one how to make and use the underlying invention — the first-generation recombinant protein — it also enables one to produce a whole host of second-generation proteins.

Starting with the sequence of the gene for the first-generation protein, a competitor can isolate that gene and then, using the disclosed nucleotide sequence as a guide, selectively make changes in the isolated gene.[25] Changes in the nucleotide sequence produce changes in the amino acid sequence of the protein. As a practical matter, therefore, the disclosure of the nucleotide sequence for the first-generation recombinant protein places anyone of ordinary skill in the art of molecular biology in the business of producing second-generation analogs of the first-generation protein.

A recent European patent application relating to "Novel Human TNF Polypeptide Mutants and DNAs Encoding Said Mutants"[26]

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21. *In re* O'Farrell, 853 F.2d 894, 903 (Fed. Cir. 1988); *Ex parte* Old, 229 U.S.P.Q. 196 (Bd. Pat. App. & Int. 1985).

22. *See, e.g.*, U.S. Patent No. 4,879,226, issued Nov. 7, 1989 (human tumor necrosis factor); U.S. Patent No. 4,659,805, issued Apr. 21, 1987 (human alveolar surfactant protein); U.S. Patent No. 4,658,021, issued Apr. 14, 1987 (human growth hormone); U.S. Patent No. 4,632,981, issued Dec. 30, 1986 (human antithrombin III).

23. The first paragraph of section 112 states:

> 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.

35 U.S.C. § 112 (1982).

24. *See supra* note 22.

25. One method for making nucleotide changes in an isolated gene is referred to as site-directed mutagenesis. This method is used to introduce pre-determined nucleotide changes at specific sites within the isolated gene. *See generally* J. WATSON *supra* note 6.

26. European Patent Application No. 0251037, filed June 16, 1987.

provides a dramatic example of the potential that exists for developing analogs of first-generation proteins. Starting with the previously disclosed sequence of the gene for human tumor necrosis factor (TNF), a protein that may be useful in treating cancer, the inventors systematically altered the gene to produce hundreds of different analogs of TNF, each differing from native TNF by a single amino acid substitution. The first two claims of the patent application are shown in Appendix B. The pressing issue for the Patent Office is how to evaluate the patentability of such recombinant protein analogs in light of the sequence disclosures of the first-generation proteins.

II. PATENTING SECOND-GENERATION RECOMBINANT PROTEINS IN THE UNITED STATES

To be patentable in the United States, a second-generation recombinant protein analog must satisfy the same statutory requirements of utility, novelty, and non-obviousness as does the first-generation protein.[27] The utility requirement may be satisfied simply by showing that the second-generation protein retains or improves upon some functional property of the first-generation protein. The analysis of the novelty and non-obviousness of the analog will differ, however, from that carried out for the first-generation protein because the patent on the first-generation protein will be available as a "prior art" reference.[28]

A. Novelty

In order for a prior art reference to "anticipate" and therefore negate the novelty of a later claimed invention, the reference must identically describe or disclose the invention in such a manner as to place it in

27. *See* 35 U.S.C. §§ 101-103 (1982). For purposes of the present discussion, the analogs of interest are those that emulate or improve upon the first-generation protein, and will therefore be assumed to satisfy the utility requirement of 35 U.S.C. § 101. *See supra* note 20 and accompanying text.

28. The term "prior art" refers to at least the statutory prior art material named in 35 U.S.C. § 102. *In re* Yale, 347 F.2d 995, 1000 (C.C.P.A. 1965). Section 102 states in pertinent part:

> A person shall be entitled to a patent unless —
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
>
> . . .
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent. . . .

Thus, the patent on the first-generation protein may be considered prior art under 35 U.S.C. § 102(a) (patent reference is prior art as of its date of issue), or § 102(e) (United States patent reference is prior art as of the date of filing).

the public domain.[29] Determining whether a patent on a first-generation recombinant protein anticipates a particular analog thus requires a consideration of whether the analog is "described" in the patent within the meaning of 35 U.S.C § 102.[30]

Given the breadth of the disclosures that may be found in a patent on a first-generation recombinant protein,[31] the question of whether a particular analog has been described for purposes of section 102 can easily deteriorate into one of semantics. For example, if the mere contemplation of making "minor modifications of [the] primary amino acid sequence"[32] of the first-generation protein were considered to be an adequate description, then the typical patent on a first-generation protein would render countless analogs unpatentable.

Although there have been no decisions to date on whether a broad generic disclosure of analogs of a first-generation recombinant protein will anticipate later claims to specific analogs encompassed by the generic disclosure, the Patent Office and courts have previously struggled with the same sort of issue in cases involving traditional chemical compounds. Those cases have held that the patenting of a broad chemical genus, embodying hundreds or thousands of possible chemical compounds, will not prevent others from obtaining patents on the individual compounds.[33]

In *In re Arkley*[34] for example, the court reversed the Patent Office's decision that the appellants' claim to a specific antibiotic compound was anticipated by virtue of having been one of the over 230,000 compounds embraced within the generic claim of an existing patent. As far as the court was concerned, such a broad disclosure, "pointing to no particular

29. *In re* Arkley, 455 F.2d 586, 587 (C.C.P.A. 1972); *In re* Brown, 329 F.2d 1006, 1011, (C.C.P.A. 1964); *In re* LeGrice, 301 F.2d 929, 930, (C.C.P.A. 1962).

30. In the following discussion, it will be assumed that the only prior art in existence at the time of the invention of the second-generation protein is the patent on the first-generation protein. *See supra* note 28.

31. *See, e.g.*, U.S. Patent No. 4,659,805, issued Apr. 21, 1987:

> [M]inor modifications of [the] primary amino acid sequence [of alveolar surfactant protein (ASP)] may result in proteins which have substantially equivalent or enhanced activit[ies.] . . . These modifications may be deliberate, as through site-directed mutagenesis, or may be accidental, such as through mutation of hosts which are ASP producing organisms. All of these modifications are included [within the scope of the invention] as long as the ASP activity is retained.

32. *Id.*

33. *See, e.g.*, *In re* Ruschig, 343 F.2d 965, (C.C.P.A. 1965) (prior art references that claimed a group of 259 compounds did not anticipate claims to four specific compounds of that group where the prior art did not specifically describe the later compounds).

34. 455 F.2d 586 (C.C.P.A. 1972).

one of the myriads of compounds, actual and potential,"[35] was not the sort of description required by section 102:

> [F]or the instant rejection under 35 U.S.C. § 102(e) to have been proper . . . [the patent] reference must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.[36]

Also instructive are those cases involving a prior art patent reference with claims directed to a general chemical formula and a vast number of possible substituents, which also discloses a more limited class of "preferred" compounds. Where a third-party has later sought to patent one of the preferred compounds and has been able to establish that the compound has some unexpected property not attributed to it by the prior art patent, the courts have refused to treat the earlier patent disclosure as an anticipation.[37]

These decisions reflect a trend by the courts to narrowly interpret section 102, so as to preclude a finding of anticipation in most instances except where the compound for which a patent is sought is individually disclosed in the prior art, or is disclosed as a member of "a small recognizable class [of compounds] with common properties."[38]

The unwillingness of the courts to apply section 102 any more expansively seems to be motivated by two related policy concerns. First, because claims to a broad genus or class of compounds can be more a product of wishful thinking and creative writing than actual invention, the patentee may be unjustly rewarded by the grant of exclusive rights to every compound encompassed by such claims. Second, denying patentability to a specific compound, solely on the grounds that it was disclosed as one of a large group of compounds, may quash the incentive of others to identify and develop those individual compounds which may possess unexpected beneficial properties. As the court stated in *In re Wiggins*:

> The mere naming of a compound in a reference, without more, cannot constitute a description of the compound. . . . If we were to hold otherwise, lists of thousands of theoretically possible compounds could be generated and published which, assuming it would be within the level of skill in the art to make them, would bar a patent to the actual discoverer of a named compound no matter how beneficial to mankind it might be. In view of the fact that the

35. *Id.* at 588.
36. *Id.* at 587 (emphasis in the original).
37. *In re* Kalm, 378 F.2d 959, 963 (C.C.P.A. 1967); *In re* Ruschig, 343 F.2d 965 (C.C.P.A. 1965).
38. *Ruschig*, 343 F.2d at 974.

> purpose sought to be effectuated by the patent law is the encouragement of innovation, such a result would be repugnant to the statute.[39]

Those same concerns apply to the products of recombinant DNA technology and provide strong support for the argument that the Patent Office and courts should strictly interpret what is "described" in a patent on a first-generation recombinant protein for purposes of 35 U.S.C. § 102. Otherwise, to allow the sweeping language of the patent on a first-generation protein to dictate the patentability of its analogs would inevitably reduce the incentive of others to invest in the research and development of second-generation proteins. This, in turn, might deprive the public of some of the most beneficial products of biotechnology. While there can be no doubt that the patentee of a first-generation protein is entitled to ample reward for his invention, it certainly should not come at such tremendous public cost.

B. Non-Obviousness

1. *The Traditional Analysis*

Assuming that a useful recombinant protein analog is not anticipated by the patent on the corresponding first-generation protein (or other prior art) and therefore satisfies the novelty requirement of 35 U.S.C. § 102, the final test of its patentability is the non-obviousness requirement of 35 U.S.C. § 103. Section 103 states:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, 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.

Congress adopted section 103 as part of the 1952 Patent Act to formalize the concept of non-obviousness and to introduce some consistency into what had become a highly variable standard of patentability.[40] However, by failing to specify exactly how obviousness was to be determined, Congress left the Patent Office and courts to fend for themselves once again. As might be expected, the results were somewhat haphazard.

In its first interpretation of the 1952 Patent Act, the Supreme Court tried to clarify the law by setting forth the general approach to be

39. *In re* Wiggins, 488 F.2d 538, 543 (C.C.P.A. 1973).
40. Graham v. John Deere Co., 383 U.S. 1, 12-17 (1966).

taken by the Patent Office and the courts in applying section 103.[41] While stating that the ultimate question of patentability is one of law, the Court said that the question of non-obviousness was necessarily informed by a three-step process of factual inquiry:

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.[42]

As to the apportionment of responsibility between the Patent Office and the courts in interpreting section 103, the Court stated that the Patent Office should strictly adhere to the analysis indicated by the Court, and should assume "primary responsibility for sifting out unpatentable material."[43] The proper role of the courts was to interpret and elaborate the standards of non-obviousness on a case-by-case basis — a responsibility that the Court then recognized would pose practical difficulties.[44]

However well this approach has worked with mechanical inventions, the assessment of non-obviousness of chemical compounds has proven to be a never-ending source of controversy,[45] and there is every reason to expect that the same will be true with recombinant proteins. The advent of biotechnology is not likely to provide the impetus for a complete rewriting or reinterpretation of section 103. Thus, the challenge for the Patent Office and the courts is to adapt and expand the well-established legal doctrine involving traditional chemical compounds to apply to the protein products of recombinant DNA technology.[46]

As with any traditional chemical compound, it is possible to assess the non-obviousness of a recombinant protein analog on the basis of either its physical structure or its functional properties. If the non-

41. *Id.* at 17-19.
42. *Id.* at 17.
43. *Id.* at 18.
44. *Id.*
45. *See, generally,* 2 CHISUM, PATENTS § 5.04[6] (1989).
46. The non-obviousness determination under 35 U.S.C. § 103 is similar to the question of what analogs are described in the patent on a first-generation protein for novelty purposes under 35 U.S.C. § 102. That is, what analogs are taught or suggested to one of ordinary skill in the art by the disclosures of the patent on a first-generation protein? In evaluating the non-obviousness of a protein analog based on its functional properties, the relevant prior art would not necessarily be limited to the patent on the first-generation protein. To the extent that other materials and knowledge in the public domain taught or suggested the functional properties of the protein analog, those would also be considered under the analysis set forth in *Graham v. John Deere.* In the following discussion, however, it will be assumed that the only prior art in existence at the time of the invention of the second-generation protein is the patent on the first-generation protein.

obviousness of a protein analog were determined solely on the basis of its structure, the test under section 103 would presumably be reduced to a rather mechanistic overlaying of amino acid sequences. According to such a test, virtually any analog of a first-generation recombinant protein might be considered obvious, and hence unpatentable.[47] The argument would be that since any molecular biologist could make changes in the gene sequence of the first-generation protein to produce any conceivable protein structure, the resulting protein analogs must be obvious. Perhaps the only debate would be at what point the alterations made to the protein structure become so extensive that the analog begins to look less like an analog of the first-generation protein and more like some other protein.

On the other hand, if the non-obviousness of an analog were assessed on the basis of its functional properties, a much more sophisticated inquiry would be required. The issue would be not whether a molecular biologist could conceive of making a particular analog given the disclosures of the patent on the first-generation protein, but whether someone of ordinary skill in the art could predict with a reasonable degree of certainty what properties the analog would possess. According to this test, a protein analog would be non-obvious, notwithstanding its structural similarity to the first-generation protein, if the analog could be shown to possess some unexpected, non-obvious property.

The Patent Office and the courts have taken the latter of these approaches in evaluating the non-obviousness of traditional chemical compounds. The leading case of *In re Papesch*[48] held that more than just the chemical structure of a compound must be considered in evaluating non-obviousness.

The *Papesch* patent application claimed certain compounds possessing potent anti-inflammatory properties. The Patent Office rejected the claimed compounds as obvious in view of their close structural similarity to several prior art compounds, despite evidence that the structurally similar prior art compounds had no anti-inflammatory activity. The court reversed the decision of the Patent Office, holding that a fundamental error of law had been committed in failing to consider the unexpected biological or pharmaceutical property of a "structurally obvious" chemical compound as evidence of its non-obviousness:

47. Thus, a test of obviousness based solely on a comparison of amino acid sequences would have the same practical effect as finding the analog to be "described" for purposes of section 102 by a broad generic claim in the patent on the first-generation protein.

48. 315 F.2d 381 (C.C.P.A 1963).

> From the standpoint of patent law, a compound and all of its properties are inseparable; they are one and the same thing. . . . [W]hile [a structural formula] may serve in a claim to identify what is being patented, as the metes and bounds of a deed *identify* a plot of land, the *thing* that is patented is not the formula but the compound identified by it.[49]

Under the *Papesch* doctrine, the non-obviousness of a chemical compound is to be determined by a consideration of all aspects of the claimed compound—its structure as well as its properties. Where the Patent Office makes out a *prima facie* case of obviousness on the basis of the close structural similarity of the claimed compound to a prior art compound, the *prima facie* case may be rebutted by evidence that the claimed compound has unexpected beneficial properties.[50] In general, such rebuttal evidence has been of two types: evidence of a property in the claimed compound not present in the prior art compound,[51] and evidence that the claimed compound is unexpectedly superior in a property it shares with a prior art compound.[52]

Applying these same principles to the case of a recombinant protein, the non-obviousness of an analog of a first-generation protein could be established in a number of ways. For example, evidence that the analog is more potent than the first-generation protein, that the analog produces fewer deleterious side effects than the first generation protein, or that the analog possesses some utility altogether lacking in the first-generation protein, could establish the non-obviousness of the analog. In each instance, the Patent Office, and perhaps ultimately a court, must determine whether an actual difference in properties between the analog and the first-generation protein exists, and if so, whether the difference would have been unexpected or non-obvious to one possessing ordinary skill in the art.

One issue not addressed in *Papesch*, however, which may prove to be especially troublesome in the case of recombinant proteins, is how to judge the difference in properties between a claimed analog and a structurally similar prior art compound when the two share significant properties in common. Individual proteins may possess multiple functional properties due to the presence of separate "functional domains" within the structure of the protein molecule.[53] An antibody molecule, for example, possesses at least three functional domains, one responsible for the binding of an antigen, and two which coordinate the interaction of

49. *Id.* at 391 (emphasis in the original).
50. *Id.* at 386-37.
51. *In re* Kalm, 378 F.2d 959 (C.C.P.A. 1967).
52. *In re* Chupp, 816 F.2d 643 (Fed. Cir. 1987); *In re* Ackermann, 444 F.2d 1172 (C.C.P.A. 1971); *In re* Lunsford, 357 F.2d 380 (C.C.P.A. 1966).
53. For general references, see *supra* note 8.

the antibody with other components of the immune response.[54] Another example is tissue plasminogen activator (tPA), an enzyme known for its activity in dissolving blood clots, which has separate functional domains for binding the protein to a blood clot and for triggering clot lysis.[55]

If a novel recombinant protein analog differs unexpectedly from the first-generation protein in one aspect, but otherwise retains all of the functional properties of the first-generation protein, should the analog be considered non-obvious? The answer to this question should be an unequivocal "yes." However, in several cases decided after *Papesch,* courts have held that the existence of significant common properties may preclude a patent on a structurally obvious chemical compound.[56] Later decisions indicated that the unexpectedly different properties of the claimed compound should be "balanced" against the common properties in order to make the ultimate determination of non-obviousness.[57]

If this "balancing" analysis were followed in determining the patentability of recombinant protein analogs, several common properties shared between the prior art protein and the recombinant analog would likely outweigh a single unexpected property of the analog. It is conceivable that analogs of all but the simplest "single function" proteins would be considered obvious. This result would have serious adverse consequences for the biotechnology industry without an apparent countervailing public policy justification. What possible purpose can be served by denying a patent on a protein analog that possesses a concededly unexpected beneficial property simply because other properties of the analog are indistinguishable from the first-generation protein?

The Patent Office has expressed concern on a number of occasions that allowing a patent on a structurally obvious chemical compound,

54. *See generally,* B. LEWIN, *supra* note 8.

55. Holvoet, Lijnen, & Collen, *Characterization of Functional Domains in Human Tissue-Type Plasminogen Activator with the Use of Monoclonal Antibodies,* 158 EUR. J. BIOCHEM. 173 (1986).

56. *In re* De Montmollin, 344 F.2d 976, 978 (C.C.P.A. 1965). *See also* Carter-Wallace, Inc. v. Davis-Edwards Pharmaceutical Corp., 341 F. Supp 1303, 1339 (E.D.N.Y. 1972), *aff'd,* 474 F.2d 529, 546 (2d Cir. 1972), *cert. denied,* 412 U.S. 929 (1973) ; *In re* Mod, 408 F.2d 1055, 1057 (C.C.P.A. 1969) (an unexpected activity in an analog was not sufficient to overcome an obviousness rejection where the compound was structurally similar to prior art compounds, because the prior art compounds also possessed the activity, but this fact had not been previously known).

57. *In re* May, 574 F.2d 1082, 1093 (C.C.P.A. 1978); *see also* Warner-Jenkinson Co. v. Allied Chem. Corp., 477 F. Supp 371, 388 (S.D.N.Y. 1979), *aff'd,* 633 F.2d 208 (2d Cir. 1980) ("courts have been moving to a test of 'essential predictability,' balancing the significance of unexpected properties resulting from minor chemical manipulations of existing compounds against the desirable properties that would be expected from such alterations").

based on evidence of a single unexpected property, would improperly allow the patentee to "dominate" any other activity which the claimed compound shared with the structurally similar prior art compound—"activity wholly unrelated to the property argued. . . ."[58] Such concern, however, is misguided. A patent on an analog that possesses some unexpected beneficial property would not take from the public that which is already theirs, or impose on them a monopoly that should not exist.[59] Even if such an analog shares significant properties in common with a prior art compound, the patent on the analog will not dominate those shared properties for the simple reason that the public's access to the first-generation protein remains unaffected.

Assuming that the analog and the first-generation protein possess different functional properties, the Patent Office must finally determine whether the difference is one that would have been obvious to someone of ordinary skill in the art.[60] In other words, for the difference in properties to make the analog patentable, the difference must be something that could not have reasonably been expected from a knowledge of the prior art at the time the analog was made.

Although much is known in the subjects of molecular biology and protein biochemistry, there is certainly much more that remains unknown. One particular area where knowledge is lacking is in predicting the functional properties of a protein from its structure.[61] It is well known that even minor changes in amino acid sequence can dramatically alter a protein's function. For example, sickle-cell anemia, an inherited blood disorder, results from a single amino acid substitution in a hemoglobin protein.[62] Also, some scientists now suspect that single amino acid changes may endow otherwise normal human proteins with cancer-producing properties.[63]

58. *In re* Ruschig, 343 F.2d 965, 978 (C.C.P.A. 1965). As suggested by the quote from *Ruschig*, under the patent laws of the United States, a patent on a compound confers rights to every use of which the compound is susceptible. *In re* Thuau, 135 F.2d 344, 347 (C.C.P.A. 1943). Thus, the granting of a patent for an analog of a multifunctional protein would secure to the patentee rights in all the properties of the analog, including those identically shared with the first-generation protein.

59. The only injustice that might result would be if the patent on the analog were held not to infringe an existing patent on the prior art compound. Under such circumstances, the patentee of the analog could freely make, sell, and use the analog for any purpose, including any utility shared with the first-generation protein, in direct competition with the prior art compound. As discussed *infra*, section III, the injustice of such a result lies not in the granting of the patent on the analog, but rather in the failure to provide an adequate scope of patent protection on the prior art compound.

60. 35 U.S.C. § 103 (1982); Graham v. John Deere Co., 383 U.S. 1, 17 (1966).

61. Van Brunt, *Beta Barrels, Helix Bundles, Hairpin Turns, and Pleated Sheets*, 6 BIO/TECHNOLOGY 655 (1988).

62. *See* J. WATSON, *supra* note 8, at 78-79.

63. *See* Bishop, *The Molecular Genetics of Cancer*, 235 SCIENCE 305 (1987).

While substantial progress is being made in developing computer models of how specific amino acid changes affect the structure of a protein, scientists are still a long way from predicting how a change in the structure of a protein will affect its function. Even where the three-dimensional structure of a protein is known from x-ray crystallography, the choice of where to make changes in the structure to achieve desired effects is still a matter of trial and error.[64]

Thus, it certainly cannot be said at this point that the disclosure of the nucleic acid sequence of the gene encoding the first-generation protein inherently reveals the properties of any specific analog, nor can knowledge of the first-generation protein's properties offer any more than a suggestion of what to expect in the analog. As the court stated in *Eli Lilly and Co. v. Generix Drug Sales, Inc.*:

> Except where the state of the medical art and the state of the chemical art have been advanced and coordinated to the point that it is possible for the mind to conceive or predict with some minimal reliability a correlation between chemical analogues, homologues or isomers and their therapeutic value, reason compels us to agree that novelty, usefulness, and non-obviousness inhere in the true discovery that a chemical compound exhibits a new needed medicinal capability, even though it be closely related in structure to a known or patented drug.[65]

Until scientific understanding of protein structure-to-function relationships improves, so that one can predict the functional effects of changes in a protein's amino acid sequence, the discovery of improved properties in an analog as compared to the first-generation protein should render the second-generation analog non-obvious.

2. *Proposal for a Formal Rule of Per Se Non-Obviousness*

In *Papesch*, the court discussed the problem of determining obviousness:

> [t]he problem of "obviousness" under section 103 in determining the patentability of new and useful chemical compounds . . . is not really a problem in chemistry or pharmacology or in any other related field of science such as biology, biochemistry, pharmacodynamics, ecology, or others yet to be conceived. It is a problem of *patent law*.[66]

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64. *See, e.g.*, Van Brunt, *supra* note 61; *Crystallographers, Gene-Splicers Remodeling Subtilisin*, McGraw-Hill's Biotechnology Newswatch, Jan. 6, 1986, at 2; Blundell & Sternberg, *Computer-Aided Design in Protein Engineering*, 3 TRENDS IN BIOTECHNOLOGY 228 (1985); Winter & Fersht, *Engineering Enzymes*, 2 TRENDS IN BIOTECHNOLOGY 115 (1984); Wilson & Klausner, *Computers Reveal Proteins' Mysteries*, 2 BIO/TECHNOLOGY 511 (1984).

65. Eli Lilly & Co. v. Generix Drug Sales, Inc., 460 F.2d 1096, 1103 (5th Cir. 1972).

66. *In re* Papesch, 315 F.2d 381, 386 (C.C.P.A. 1963) (emphasis in original).

It is difficult to regard that statement today without a certain degree of skepticism, considering the technical complexity of the evidence on which the Patent Office must base its determination of obviousness. In the case of a recombinant protein analog, it may be necessary for a patent examiner to interpret comparative studies of an analog's properties and those of the first-generation protein. If differences exist, then she must review patent references and scientific literature in molecular biology, protein biochemistry, physiology, and pharmacology, to discern whether the prior art would lead one skilled in the art to predict the analog's properties.

While this approach is not conceptually different from that which the Patent Office undertakes in reviewing other patent applications, the practical difficulties of engaging in such detailed analysis for each of the multitude of recombinant protein analogs for which patent applications have been filed, are substantial.

The total backlog of pending biotechnology patent applications in the U.S. Patent Office as of May 1989 stood at 14,783.[67] Because of this backlog, applicants must now wait about thirteen months before an examiner even looks at an application, and another thirteen months before a final decision is issued.[68] This backlog is more than just a nuisance. According to a number of experts, the backlog in biotechnology-related patent applications is undermining the viability of the biotechnology industry.[69] If only to reduce the potential for an even more severe backlog in biotechnology patent applications, it is reasonable to consider whether there might be an alternative to the present approach for evaluating the patentability of recombinant protein analogs.

One possibility worthy of serious consideration is for the Patent Office to adopt a formal rule of *per se* non-obviousness for novel protein analogs. Such an approach may sound like a radical departure from the established criteria of patentability developed in *Papesch* and its progeny. However, there are good reasons to believe that a rule of *per se* non-obviousness would achieve similar results to those reached under the traditional analysis.

The concern evoked by a rule of *per se* non-obviousness is that patents will be sought and issued for analogs that would have otherwise

67. J. Kittle, Materials from the Board Meeting of the Biotechnology Institute, U.S. Patent and Trademark Office (July, 1989) (available at the *High Technology Law Journal* Office).

68. *Id. See also* Crawford, *Patent Claim Buildup Haunts Biotechnology*, 239 SCIENCE 723 (1988).

69. Yoo, *Biotech Patents Become Snarled in Bureaucracy*, Wall St. J., July 6, 1989, sec. 2 at 1, col. 6. *See also* Merges, *Congress Expresses Concern over Backlog of Biotech Patent Applications*, Genetic Engineering News, June 1988, at 3, col. 1.

been found obvious and unpatentable. Such analogs fall into two categories: analogs with properties indistinguishable from the first-generation protein, and analogs whose properties, though different from the first-generation protein, are made obvious by the prior art.

With respect to the first group of analogs, it is doubtful whether anyone would even go to the trouble of filing a patent application. Considerable expense would be incurred in drafting and prosecuting a patent application which, once issued as a patent, in all likelihood would subject the applicant or his assignee to an infringement action by the owner of the patent on the corresponding first-generation protein.[70]

With respect to the second group of analogs, perhaps the complete answer to the concern over such proteins being *per se* non-obvious is to point out that such obvious analogs simply do not exist, and will not exist until the predictability of protein structure-to-function relationships is substantially more advanced. Accordingly, the Patent Office's demanding, case-by-case examination of applications for patents on recombinant protein analogs for compliance with section 103 seems entirely out of step with the realities that affect the decision to file for a patent and the practical limitations of the relevant technology.

Moreover, a strong argument may be made that a rule of *per se* non-obviousness is in fact compelled by the present case law interpreting section 103. Recall that even under the traditional analysis of chemical obviousness, the need for the applicant to present objective evidence of unexpected or non-obvious properties arises only after the Patent Office has established a *prima facie* case of obviousness.[71] In *Papesch*, the *prima facie* case was satisfied by the mere showing of structural similarity between the claimed compound and the prior art compound. Later decisions, however, have held the Patent Office to a higher standard.

For example, in *In re Taborsky*,[72] the court stated that "[i]n determining the propriety of the Patent Office case for prima facie obviousness, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the proposed substitution or other modification."[73] More recently, the Court of Appeals for the Federal Circuit has stated that "generaliza-

70. Infringement analysis is discussed *infra* section III. Another alternative is that the parties will agree to cross-license their patents to the other.

71. *In re* Grabiak, 769 F.2d 729, 731 (Fed. Cir. 1985); *In re* Papesch, 315 F.2d 381, 381 (C.C.P.A. 1963).

72. 502 F.2d 775 (C.C.P.A. 1974).

73. *Id.* at 780; *see also In re* Lalu, 747 F.2d 703 (Fed. Cir. 1984).

tion should be avoided insofar as specific chemical structures are alleged to be *prima facie* obvious one from the other."[74]

The Patent Office Board of Appeals has followed the decisions in this line of cases in deciding the obviousness of a recombinant protein. In *Ex parte Goeddel*,[75] the patent examiner had rejected claims to a recombinant form of human leukocyte interferon which had an amino acid sequence slightly different from that of the naturally occurring interferon, on the grounds that the recombinant protein was structurally obvious and not seen to differ in kind from the natural protein. The Board of Appeals reversed the examiner's rejection, finding that the evidence did not even support a *prima facie* case of obviousness:

> This rejection on its face . . . is not sustainable. The statutory inquiry is obviousness and not "differ in kind." Whatever that means, palpably it is not a proper basis for a rejection. . . . No reasons have been given, nor are apparent to us, which would have motivated the artisan in this field to prepare a "modified" form of the interferons of the prior art by recombinant DNA technology, the isolated natural proteins of the references being limited to those structures and properties as found. That there can be variations in the number of amino acids in natural leukocyte interferons clearly cannot be basis for a holding of obviousness of those at issue, they being neither taught nor suggested by the references, nor present in their systems.[76]

Considered in light of these decisions, a rule of *per se* non-obviousness for novel recombinant protein analogs is not a radical departure from present judicial doctrine, but rather a means for the Patent Office to implement that doctrine in the most efficient manner possible.

III. INFRINGEMENT OF THE PATENT ON A FIRST-GENERATION RECOMBINANT PROTEIN

There is a high probability that scientists will find some recombinant protein analogs that have new or improved beneficial properties compared to the corresponding first-generation protein.[77] The production of recombinant protein analogs is a worthy pursuit for that reason, and the analogs themselves deserve some degree of patent protection. At the same time, such development efforts clearly pose a competitive threat to the patentee of the first-generation protein. Because the nucleotide sequence disclosure of the gene encoding the first-generation protein enables one of ordinary skill in the art to make analogs, it also

74. *Grabiak*, 769 F.2d at 731.

75. 5 U.S.P.Q.2d 1449 (Bd. Pat. App. & Int. 1985).

76. *Id.* at 1450-51.

77. *See e.g.*, *SmithKline, British Gene Synthesizer Join to Make a 'Third Generation' TPA*, McGraw-Hill's Biotechnology Newswatch, June 1, 1987, at 1; Klausner, *Researchers Probe Second-Generation t-PA*, 4 BIO/TECHNOLOGY 706 (1986).

enables one to attempt to "invent around" the patent on the first-generation protein. This raises a different issue, separate from the question of patentability of recombinant protein analogs, and that is, under what circumstances a second-generation analog will be held to infringe the patent on a first-generation protein.

Under United States law, patent infringement occurs whenever a person "without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor."[78] Because patent claims measure and define an invention, the first step in analyzing patent infringement is to determine their scope.[79] Claim interpretation is a question of law.[80]

In determining the proper scope of the claims, a court must consider the language of the claims not in isolation, but rather in the context of the patent reference as a whole.[81] Particular attention is given to the specification disclosures, both for meaning of particular terms used in the claims[82] and for an understanding of the invention actually patented. As the Supreme Court has stated, "[w]hile the claims of a patent limit the invention, and specifications cannot be utilized to expand the patent monopoly, it is fundamental that claims are to be construed in the light of the specifications and both are to be read with a view to ascertaining the invention. . . . "[83]

If the alleged infringing matter falls within the scope of the claims as properly construed, there is "literal" infringement.[84] One important way in which the accused infringer may seek to have the court narrowly construe the claims, to avoid a finding of literal infringement, is by raising the enablement requirement of 35 U.S.C. § 112 as a defense.[85] According to section 112, the scope of enablement and the scope of the claims are symmetrical.[86] The relevant inquiry is "whether the scope of

78. 35 U.S.C. § 271(a) (1982).

79. Mannesmann Demag Corp. v. Engineered Metal Products, 793 F.2d 1279, 1282 (Fed. Cir. 1986); Caterpillar Tractor Co. v. Berco, S.P.A., 714 F.2d 1110, 1114 (Fed. Cir. 1983), *cited in* Texas Instruments, Inc. v. United States Int'l Trade Comm'n., 805 F.2d 1558, 1562 (Fed. Cir. 1986). Every patent application must conclude with one or more "claims" particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention. 35 U.S.C. § 112 (1982), para. 2.

80. Johnston v. IVAC Corp., 885 F.2d 1574, 1579-80 (Fed. Cir. 1989).

81. Fonar Corp. v. Johnson & Johnson, 821 F.2d 627, 631 (Fed. Cir. 1987), *cert. denied* 484 U.S. 1027 (1988); Moeller v. Ionetics, Inc., 794 F.2d 653, 656 (Fed. Cir. 1986).

82. *Fonar Corp.*, 821 F.2d at 632; Howes v. Medical Components, Inc., 814 F.2d 638, 644 (Fed. Cir. 1987).

83. United States v. Adams, 383 U.S. 39, 48-49 (1966) (citation omitted).

84. Atlas Powder Co. v. E. I. DuPont de Nemours & Co., 750 F.2d 1569, 1579 (Fed. Cir. 1984).

85. *Id.* at 1576.

86. *In re* Hyatt, 708 F.2d 712, 714 (C.C.P.A. 1983)

enablement provided to one of ordinary skill in the art by the disclosure is such as to be commensurate with the scope of protection sought by the claims."[87]

The question of what analogs are "enabled" for purposes of section 112 by the disclosure of the coding sequence for the first-generation protein is related to the question of what analogs are rendered obvious for purposes of section 103.[88] The predictability of an analog's functional properties helps in determining whether the analog is enabled by the patent on a first-generation protein in the same way that it helps in determining whether the analog is obvious.

In the chemical arts, the relationship between the predictability of the subject matter claimed and the scope of enablement is illustrated by the case of *In re Fisher*.[89] In *Fisher*, the applicant claimed as his invention preparations of the natural protein, adrenocorticotrophic hormone (ACTH), having a potency of "at least 1 International Unit of ACTH per milligram." The specification disclosed a method of producing ACTH preparations having potencies of 1.11 to 2.3 International Units per milligram.[90] The issue was whether the disclosure of preparations of ACTH of rather limited potency could support the claim to all preparations having a potency of greater than one International Unit per milligram, including future preparations having potencies far in excess of those disclosed. The court said "no," holding that the scope of enablement provided by the specification was limited by the unpredictable nature of the scientific methods involved:

> [Section 112] requires that the scope of the claims must bear a reasonable correlation to the scope of enablement provided by the specification to persons of ordinary skill in the art. In cases involving predictable factors, such as mechanical or electrical elements, a single embodiment provides broad enablement in the sense that, once imagined, other embodiments can be made without difficulty and their performance characteristics predicted by resort to known scientific laws. In cases involving unpredictable factors, such as most chemical reactions and physiological activity, the scope of enablement obviously varies inversely with the degree of unpredictability of the factors involved.[91]

87. *In re* Moore, 439 F.2d 1232, 1236 (C.C.P.A. 1971); *see also Hyatt*, 708 F.2d at 715.

88. For a general discussion of the relationship between obviousness and enablement, see D. Chisum, *Anticipation, Enablement and Obviousness: An Eternal Golden Braid*, 15 AIPLA Q. J. 57 (1987).

89. 427 F.2d 833 (C.C.P.A. 1970).

90. *Id.* at 834-35.

91. *Id.* at 839.

Similarly, inventions based on recombinant DNA technology generally involve unpredictable factors and thus enable a narrower range of claims.[92]

That, however, does not necessarily mean that the claims in a patent on a first-generation recombinant protein must be limited to cover only that protein. The claims may extend to analogs of the first-generation protein, notwithstanding the general unpredictability of the technology involved, provided that the disclosures in the patent are complete enough to enable one of ordinary skill in the art to make and use the claimed analogs without "undue experimentation."[93]

What constitutes undue experimentation is not a simple factual determination. Rather, it is a conclusion reached by weighing several factors, including the quantity of experimentation necessary, the amount of direction or guidance provided by the disclosures in the patent, and the presence or absence of working examples.[94] In the recent case of *In re Mark*,[95] the U.S. Patent Office Board of Appeals dealt specifically with this issue in the context of recombinant protein analogs.

In *Mark*, the appealed claims were directed to all analogs ("muteins") of all biologically active native proteins, which analogs have the same biological activity and the same amino acid sequence as the corresponding native protein except that a single amino acid, cysteine, that is present in the native protein is deleted or substituted by a different amino acid in the analog. The patent examiner rejected those claims under 35 U.S.C. § 112, first paragraph, for lack of a sufficiently enabling disclosure. The specification disclosed the preparation, by recombinant methods, of cysteine-mutant analogs of three different native proteins, interferon-beta, interleukin-2, and tumor necrosis factor. Essentially, the position taken by the examiner was that it would require undue further experimentation to construct the innumerable analogs encompassed by the claims and to screen the analogs produced for any of those which retained biological activity.

The Board of Patent Appeals, however, held that the claims were enabled and reversed the examiner's rejection. Of apparent importance to the Board were the facts that the claimed analogs were limited to those having a certain biological property, and that the application dis-

92. Hormone Research Found. v. Genentech, Inc., 708 F. Supp. 1096, 1108 (N.D. Cal. 1988); *Ex parte* Forman 230 U.S.P.Q. 546, 548 (Bd. Pat. App. & Int. 1986).

93. *See, e.g.*, Hybritech, Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1384 (Fed. Cir. 1986), *cert. denied* 480 U.S. 947 (1987); *In re* Angstadt, 537 F.2d 498, 504 (C.C.P.A. 1976).

94. *In re* Wands, 858 F.2d 731, 737 (Fed. Cir. 1988); *Forman*, 230 U.S.P.Q. at 547.

95. 1989 Pat. App. LEXIS 12 (Bd. Pat. App. & Int. 1989).

closed routine methods by which such analogs could be prepared and identified:

> When it is considered that the claims remaining on appeal all require that the mutein produced retain the biological activity of the native protein, we consider the disclosure of this application to be enabling. . . . The record before us establishes that for a given protein having cysteine residues, one skilled in the art would be able to routinely determine whether deletion or replacement of the cysteine residues would result in a mutein which is within the claims on appeal.[96]

It remains to be seen how this decision will be applied in determining the scope of permissible claims in a patent on a first-generation recombinant protein. At the very least, *Mark* suggests that the claims should be limited to encompass only those analogs having certain well-defined functional properties—specifically, the same properties as the first-generation protein. Absent working examples of analogs having functional properties different from the first-generation protein, claims encompassing such analogs should be rejected for lack of enablement, on the grounds that their existence is wholly unpredictable.

If a second-generation analog does not literally infringe the patent on a first-generation recombinant protein, it still may be found to infringe under the "doctrine of equivalents."[97] Under this judicially-created doctrine, a product that does not fall within the literal language of the patent claims, but does perform "substantially the same overall function or work, in substantially the same way, to obtain substantially the same overall result as the claimed invention,"[98] will infringe that patent. The doctrine's purpose is equitable. It protects the patentee from the "unscrupulous copyist . . . [who makes] unimportant and insubstantial changes and substitutions in the patent which, though adding nothing, would be enough to take the copied matter outside the claim, and hence outside the reach of the law."[99]

In applying the doctrine of equivalents, the degree of protection afforded beyond the language of the claims will vary directly with the value of the inventor's contribution to the art.[100] Where the court is confronted with a so-called "pioneer" invention,[101] "liberality becomes

96. *Id.* at *9.

97. *See, e.g.,* Hughes Aircraft Co. v. United States, 717 F.2d 1351, 1361 (Fed. Cir. 1983).

98. Pennwalt Corp. v. Durand-Wayland Inc., 833 F.2d 931, 934 (Fed. Cir. 1987), *cert. denied* 485 U.S. 961 (1988).

99. Graver Tank & Mfg. Co. v. Linde Air Prods. Co., 339 U.S. 605, 607 (1950).

100. *See* Texas Instruments, Inc. v. U.S. Int'l Trade Comm'n., 846 F.2d 1369, 1370 (Fed. Cir. 1988).

101. Westinghouse v. Boyden Power Brake Co., 170 U.S. 537, 562 (1898) (Pioneer inventions are "a distinct step in the progress of the art, distinguished from a mere improvement or perfection of what had gone before").

the keynote of construction requiring the court to give the patentee a wide breadth of protection in construing the patent claims and specifications."[102]

Relying on these two approaches to infringement, what can be said about the scope of protection afforded by the patent on a first-generation recombinant protein? The patent on the first-generation protein at least encompasses those analogs with properties similar in type and degree to the first-generation protein, as long as they are specifically claimed and can be prepared without undue experimentation. Even if not within the literal claim language, such analogs would likely infringe under the doctrine of equivalents. In *Hybritech v. Abbott Laboratories*, for example, the district court held that the use of antibody "Fab" fragments — essentially, truncated forms of native antibody proteins — in an antigen-binding assay infringed, under the doctrine of equivalents, claims directed to the use of whole antibodies in such an assay, on the grounds that Fab fragments "do the same thing in essentially the same way as the whole antibody."[103]

The difficult question is where to draw the line when the analog has properties which differ in degree from the first-generation protein. For example, would an analog with 10% greater biological or therapeutic activity be held to infringe under the doctrine of equivalents on the grounds that it is "substantially" the same as the first-generation protein? What about an analog with 50% or 100% greater activity?

One possible answer to the line-drawing question may be found in *Atlas Powder Co. v. E. I. DuPont de Nemours & Co.*[104] In that case, the Court of Appeals for the Federal Circuit suggested in dicta that the granting of a patent on a product "A" may be evidence of non-infringement under the doctrine of equivalents of the patent on product "B," provided that product "A" was patented on the basis of certain unexpected properties not present in product "B." The court reasoned that a finding of non-equivalence would be proper in such a case because the two products would achieve substantially different results, in contravention of the third prong of the doctrine of equivalents test.[105] According to this view, an analog that a patent examiner determines has properties sufficiently different in degree to be found non-obvious, would also be non-equivalent and, thus, non-infringing.

102. Corning Glass Works v. Anchor Hocking Glass Corp., 374 F.2d 473, 476 (3d Cir. 1967), *cert. denied* 389 U.S. 826 (1967).

103. 4 U.S.P.Q.2d 1001, 1012 (C.D. Cal. 1987), *aff'd* 849 F.2d 1446 (Fed. Cir. 1988).

104. 750 F.2d 1569 (Fed. Cir. 1984).

105. *Id.* at 1580 n.3.

Analogs with properties different *in kind* from the first-generation protein are not likely to infringe the first patent. Claims which literally encompass analogs with differing properties should not be allowed by an examiner. Nor would such an analog be found to infringe under the doctrine of equivalents. As stated in *Papesch*, "from the standpoint of patent law, a compound and all of its properties are inseparable."[106] The invention embodied by the patent on a first-generation protein is not merely the protein structure or the particular sequence of amino acids, rather, the invention is the protein as a whole, comprising a sequence of amino acids and possessing certain defined properties. Accordingly, analogs with properties altogether different from those of the corresponding first-generation protein should certainly be considered outside the scope of that invention.

IV. CONCLUSION

The U.S. Patent Office and the courts share responsibility for assuring that the inventors of first- and second-generation recombinant proteins receive adequate protection for their inventions under existing patent laws.

The Patent Office should adopt reasonable procedures for determining the patentability of second-generation recombinant proteins to expedite the issuance of patents for products legitimately deserving of protection. One step in that direction would be for the Patent Office to adopt a *per se* rule of non-obviousness for second-generation recombinant proteins until further advances in the art make the prediction of some protein structure-to-function relationships possible.

The claims allowed for the patent on the first-generation protein should be broad enough to cover the invention actually enabled by the disclosure, but nothing more. In construing those claims, courts should accord protection commensurate in scope with the inventor's contribution to the public. In view of the ease with which competitors can make analogs once a protein's nucleotide sequence is revealed, the original patent claims should be construed to include those analogs where the changes are insignificant. Absent that, the patent on a first-generation protein will be little more than an invitation for others to appropriate the invention by making minor modifications to the protein.

At the same time, however, the Patent Office and courts must not give the inventor of the first-generation protein complete control over all subsequent advances and developments which may derive from the patent disclosure. Although the task of balancing the competing interests

106. *In re* Papesch, 315 F.2d 381, 391 (C.C.P.A. 1963).

of the patentee and the public may be difficult, no less is required if the patent system is to remain a viable incentive to innovation in this area of biotechnology.

APPENDIX A

SUMMARY OF PENDING BIOTECHNOLOGY PATENT LITIGATION

Plaintiff	Defendant	Product	Action
Amgen	Genetics Institute	erythropoietin	Both parties' patents held valid and infringed. Parties have begun cross-licensing discussions.
BioPolymers	Genex	mussel-glue	Suit settled February 1989. BioPolymers will grant Genex a non-exclusive license to its patent.
Eli Lilly	Genentech	human growth hormone	Suit filed in U.S. District Court in March 1987 alleging invalidity of four patents. As patents issue worldwide, Lilly initiates suits (England, France, New Zealand, and South Korea).
Genentech	Wellcome Foundation	tPA	Genentech's U.K. patent held invalid as being overly broad.
Genentech	Toyobo	tPA	Suit filed in Japan in August 1987, alleging infringement of Genentech's Japanese patent. Genentech's motion for temporary injunction denied.
Genentech	Abbott	tPA	Suit filed April 1988, seeking declaratory judgment of invalidity or non-infringement.
Hoffman-La Roche	Wellcome	alpha-interferon	Suit filed October 1986, alleging infringement of Hoffman-La Roche patent.
Hormone Research	Genentech	human growth hormone	Suit filed alleging infringement of Hormone Research patent.
Scripps	Genentech	Factor VIII	Scripps won summary judgment on infringement suit in 1987. Scripps patent held invalid in 1989.

APPENDIX B
EXAMPLE OF PATENT CLAIM DIRECTED TO SECOND-GENERATION RECOMBINANT PROTEIN ANALOGS

What is claimed is:

1. A polypeptide having an amino acid sequence represented by formula [I] below in which at least one of the 16th, 31st to 34th, 36th, 48th, 73rd, 82nd, 85th, 89th, 94th, 97th, 98th, 103rd, 113th, 115th, 117th, 118th, 131st, 132nd, 141st to 146th, and 153rd amino acid residues is replaced by another amino acid residue, with the proviso that when the 115th amino acid residue is replaced by another amino acid residue, the 67th amino acid residue and/or the 99th amino acid residue may be replaced by another amino aid residue; or a polypeptide resulting from deletion of one or at most 8 successive amino acid residues from the N-terminus of said polypeptide:

Ser	Ser	Ser	Arg	Thr	Pro	Ser	Asp	Lys	Pro
Val	Ala	His	Val	Val	Ala	Asn	Pro	Gln	Ala
Glu	Gly	Gln	Leu	Gln	Trp	Leu	Asn	Arg	Arg
Ala	Asn	Ala	Leu	Leu	Ala	Asn	Gly	Val	Glu
Leu	Arg	Asp	Asn	Gln	Leu	Val	Val	Pro	Ser
Glu	Gly	Leu	Tyr	Leu	Ile	Tyr	Ser	Gln	Val
Leu	Phe	Lys	Gly	Gln	Gly	Cys	Pro	Ser	Thr
His	Val	Leu	Leu	Thr	His	Thr	Ile	Ser	Arg
Ile	Ala	Val	Ser	Tyr	Gln	Thr	Lys	Val	Asn
Leu	Leu	Ser	Ala	Ile	Lys	Ser	Pro	Cys	Gln
Arg	Glu	Thr	Pro	Glu	Gly	Ala	Glu	Ala	Lys
Pro	Trp	Tyr	Glu	Pro	Ile	Tyr	Leu	Gly	Gly
Val	Phe	Gln	Leu	Glu	Lys	Gly	Asp	Arg	Leu
Ser	Ala	Glu	Ile	Asn	Arg	Pro	Asp	Tyr	Leu
Asp	Phe	Ala	Glu	Ser	Gly	Gln	Val	Tyr	Phe
Gly	Ile	Ile	Ala	Leu				. . .	[I]

2. A polypeptide according to claim 1 wherein
(A) at least one of the following replacements of amino acids in the amino acid sequence of formula [I] is effected:

16th	Ala	by Val,
31st	Ala	by Thr,
32nd	Asn	by Ala, Cys, Asp, His, Ile, Arg, Ser, Thr, Val, or Tyr,

34th	Leu	by Ile,
36th	Ala	by Val,
48th	Val	by Met,
73rd	Leu	by Pro,
82nd	Ala	by Asp,
85th	Tyr	by His,
89th	Val	by Ile,
94th	Ala	by Thr,
97th	Ser	by Asn,
98th	Pro	by His or Leu,
103rd	Thr	by Pro,
113th	Tyr	by Cys,
115th	Pro	by Leu, His, Gln, Ser, Ala, Phe, Asn, Gly, Tyr, Val, Glu, Met, Ile, Asp, Trp, Lys, Arg, or Thr,
117th	Tyr	by His,
118th	Leu	by Gln,
131st	Ser	by Ile,
132nd	Ala	by Thr,
141st	Asp	by Tyr,
143rd	Ala	by Val,
144th	Glu	by Lys,
145th	Ser	by Cys,
146th	Gly	by Glu, and
153rd	Ile	by Leu;

(B) 67th Cys and/or 99th Cys are replaced by Ser and 115th Pro is replaced by an amino acid other than Pro in an amino acid sequence represented by formula [I]; or

(C) the polypeptide (A) or (B) in which one or at most 8 successive amino acid residues from the N-terminus is deleted.

COMMENT

FEDERAL INTELLECTUAL PROPERTY PROTECTION FOR COMPUTER SOFTWARE AUDIOVISUAL LOOK AND FEEL: THE LANHAM, COPYRIGHT, AND PATENT ACTS

BY GREGORY J. WRENN †

Table of Contents

† Candidate for J.D. 1990, Boalt Hall School of Law, University of California, Berkeley; B.A. 1983, University of Washington. This comment received second prize in the 1989 Nathan Burkan Memorial Competition at Boalt Hall School of Law, University of California, Berkeley. The author would like to thank Professor Stephen R. Barnett for his many helpful comments on previous drafts; the author is, of course, solely responsible for the content of this comment.

INTRODUCTION

The judiciary should brace itself for a surge of computer software-related litigation in the coming years. The Patent Office, once hostile toward claims involving software,[1] now commonly issues patents for software inventions.[2] As a result,

> [t]he threat of [patent infringement] accusations is casting a pall over software development. . . . More companies are filing patents, and, most likely, will soon turn to litigation to guard them.[3]

This imminent litigation is apt to involve the "look and feel"[4] of computer software audiovisual displays,[5] as well as legal theories of pro-

1. In 1966, the President's Commission on the Patent System recommended that computer programs *per se* be excluded from patent protection. This recommendation was based in part on the Patent Office's inability to deal with the administrative burden of examining such claims. THE PRESIDENT'S COMM. ON THE PATENT SYSTEM, "TO PROMOTE THE PROGRESS OF . . . USEFUL ARTS" IN AN AGE OF EXPLODING TECHNOLOGY 14 (1966). *See also* Diamond v. Diehr, 450 U.S. 175, 197 (1981) (Stevens, J., dissenting).

2. Maier, *Software Protection—Integrating Patent, Copyright and Trade Secret Law*, 69 J. PAT. & TRADEMARK OFF. SOC'Y 151, 157 (1987). Although the Patent Office does not track software-related patents as a separate category, attorneys and industry executives claim that top U.S. companies have doubled, and even quadrupled, the number of applications they file. Bulkeley, *Will Software Patents Cramp Creativity?*, Wall St. J., Mar. 14, 1989, at B1, col. 5. IBM alone files approximately 200 software-related patent applications each year. *Id.*

3. Bulkeley, *supra* note 2, at B1, col. 3. Patents are also used for defensive purposes. "We use patents principally as trading material for our own freedom of action in the marketplace." *Id.* at B1, col. 5 (statement of Roger S. Smith, IBM's director of intellectual property law). *See also* Fisher, *Software Industry in Uproar over Recent Rush of Patents*, N.Y. Times, May 12, 1989, at 1, col. 5.

4. Section I, *infra*, defines and describes this subject matter in greater detail. Briefly, the look and feel of computer software audiovisual displays refers to "the sequence of the screens and the choices presented, the layout of the screens, and the method of feedback to the user. . . ." Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127, 1137 (N.D. Cal. 1986).

5. *See, e.g.*, the following patents which, if litigated, are likely to involve issues of computer software look and feel: U.S. Patent No. 4,823,108 issued Apr. 18, 1989 to Gary W. Pope and assigned to Quarterdeck Office Systems, for an "improved display system and memory architecture and method for displaying images in windows on a video display"; U.S. Patent No. Re. 32,632, issued Mar. 29, 1988 to William D. Atkinson and assigned to Apple Computer, Inc., for a "display system" composed of pull-down menus used in conjunction with the Apple mouse; U.S. Patent No. 4,646,250 issued Feb. 24, 1987 to John F. Childress and assigned to IBM, for a "data entry screen for an interactive data entry system" that provides a means of identifying to the user fields where data may be entered and fields where data must be entered; U.S. Patent No. 4,486,857 issued Dec. 4, 1984 to Paul C. Heckel and assigned to Quickview Partners, for a "display system for the suppression and regeneration of characters in a series of fields in a stored record."

tection in addition to patent law. The means and scope of protection available for look and feel remain uncertain, yet the "stakes of this debate are enormous."[6]

This comment reviews the means and scope of protection for computer software look and feel available from federal statutory sources: trade dress protection under Section 43(a) of the Lanham Act of 1946,[7] the Copyright Act of 1976,[8] and the Patent Act of 1952.[9] In this context we see the full presence of competing interests in the structure of the nation's industrial policy. As a result, the analysis of one body of law helps answer questions in another.

Specifically, this comment proposes that the focus of the doctrine of functionality under Section 43(a) of the Lanham Act be adopted for analyzing the idea/expression dichotomy in copyright law, as well as the functional/nonfunctional distinction of design patent protection. Some courts applying the doctrine of functionality in trade dress cases treat the label "functional" as a legal conclusion, not a metaphysical fact. If trade dress protection for a product feature would unduly hinder competition, the feature is deemed functional and not protected. This form of analysis proves useful in the areas of copyrights and design patents. Further, it is consistent with the underlying rationale for such distinctions in each body of law: enough protection should be provided to reward innovation, but in no event should product protection become a market monopoly.

Section I of this comment describes computer software audiovisual look and feel, and examines the market for the technology. Section II explores the availability of trade dress protection for computer software look and feel under Section 43(a) of the Lanham Act. Section III discusses copyright protection and develops a proposal for refocusing the idea/expression analysis under the Copyright Act based on the doctrine of functionality under the Lanham Act. Section IV considers the validity of utility and design patents for computer software look and feel, and advances a proposal, based on the doctrine of functionality under the Lanham Act, for refocusing the functional/nonfunctional distinction of design patents. This comment is followed by an appendix which provides an illustrated guide to the technology discussed herein.

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6. Beutel, *Trade Dress Protection for the "Look and Feel" of Software: A New Source of Proprietary Rights Protection for the Software Industry?*, 5 COMPUTER LAWYER, Oct. 1988, at 2.

7. 15 U.S.C. § 1125(a) (1988). The Lanham Act codifies U.S. trademark law.

8. 17 U.S.C. §§ 101-810 (1988).

9. 35 U.S.C. §§ 1-376 (1982 & Supp. V 1987).

I. THE LOOK AND FEEL OF COMPUTER SOFTWARE AUDIOVISUAL DISPLAYS

Computer programs manifest themselves in any number of ways.[10] Similarly, the term "look and feel," also known as "total concept and feel," has been used by copyright lawyers in a number of contexts.[11] Applied to computer software, it refers to the look and feel of written program instructions[12] as well as the look and feel of a program's audiovisual displays.[13] This comment is concerned only with the latter. This section will describe the technology at issue and consider it within its market context.

A. The Technology

A computer program normally generates audiovisual displays as one means of communicating with the user, a part of the user interface. The user interface is the means by which the software and user interact to achieve the desired result.[14] Normally one uses a typewriter-like keyboard or a pointing device (such as a "mouse") to issue commands to the program or enter other information, including data. All or part of these commands may be visible on screen and available for selection from a "menu." Selecting a command may execute a function or

10. Computer programs are usually seen as a set of statements or instructions. *See, e.g.*, 17 U.S.C. § 101 (1988). But courts and agencies must routinely distinguish specific manifestations of programs from programs *per se*. *See, e.g.*, Diamond v. Diehr, 450 U.S. 175 (1980) (algorithms contained in program instructions); Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986) (the look and feel of computer software audiovisual displays); Synercom Technology, Inc. v. University Computing Co., 462 F. Supp. 1003 (N.D. Tex. 1978) (data input formats); NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT 23 (1978) [hereinafter CONTU REPORT] (data bases, *e.g.* encyclopedias or dictionaries, stored in magnetic form and accessed by a computer program); 53 Fed. Reg. 38,110 (1988) (policy decision on copyrightability of digitized typefaces stored in computer programs).

11. *See, e.g.*, Sid & Marty Krofft Television Prods. v. McDonald's Corp., 562 F.2d 1157 (9th Cir. 1977) (total concept and feel of television shows and commercials); Roth Greeting Cards v. United Card Co., 429 F.2d 1106, 1110 (9th Cir. 1970) (total concept and feel of greeting cards).

12. Written programming instructions (or "source code") was the subject of Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987), and is outside the scope of this comment.

13. *See, e.g.*, Atari, Inc. v. North American Philips Consumer Elecs. Corp., 672 F.2d 607, 614 (7th Cir. 1982), *cert. denied*, 459 U.S. 880 (1982); Digital Communications Assoc. v. Softklone Distrib. Corp., 659 F. Supp. 449, 465 (N.D. Ga. 1987); Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986).

14. Other elements of the computer system, such as the keyboard, central processing unit, memory storage devices, video display, printers, etc., may be involved in the process of achieving the desired result. To the extent that they interact with the user directly, they are part of the user interface (*e.g.*, pressing keys on the keyboard to issue a command).

produce a list or "submenu" of additional choices. Executing a command usually results in visual feedback to the user on the computer's display. (Further information may be found *infra*, in the appendix, which provides an illustrated guide to computer software look and feel; it includes a description of four products that are, or have been, the subject of look and feel litigation.)

Look and feel includes individual audiovisual displays, as well as *dynamic* elements in the user interface.[15] Unlike a motion picture, a program's screens are usually designed to follow a functional, not chronological, order.[16] Look and feel is "the sequence of the screens and the choices presented, the layout of the screens, and the method of feedback to the user. . . ."[17] One manufacturer described the look and feel of its computer's user interface this way: "Just listing the elements . . . doesn't do it justice . . . it's the way they all work together—*the gestalt.*"[18]

Listing the elements of the interface does not do it justice because copyright owners are not seeking protection for just the elements. Were that the case, "a plagiarist would escape by immaterial variations."[19] Rather, software developers seek protection against those competitors who use the same or similar audiovisual displays, presented in the same or similar structure, sequence, and organization. This explains the nebulous character of the term "look and feel," and the difficulty courts have in defining the scope of protection. "[A]s soon as literal appropriation ceases to be the test, the whole matter is necessarily at large. . . ."[20]

B. The Market

Software has been a significant and growing element of the economy; by 1988, the worldwide market for software reached an estimated $50 billion.[21] Software is produced by large and small firms, and there is a trend toward mass-marketed programs.[22] In spite of somewhat uncertain intellectual property protection, the market seems to have fared well. For example, while U.S. electronics manufacturers have suffered at

15. For examples of dynamic aspects of a user interface, *see infra* Appendix, Figures 1 and 2, and accompanying text.

16. LaPlante, *Mac 'Look and Feel' Legal Issues Remain Unclear*, InfoWorld, Jan. 5, 1987, at 23.

17. Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. at 1137.

18. J. Koltnow, *Who Can Use the Macintosh Interface?*, OUTSIDE APPLE, Oct. 1986 (emphasis added) (a newsletter published by Apple Computer, Inc., for outside developers).

19. Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

20. *Id.*

21. O'Connor, *Software Firms Fear Patents May Stifle Innovation*, San Jose Mercury News, Mar. 6, 1989, at 1A, col. 5.

22. CONTU REPORT, *supra* note 10, at 38.

the hands of offshore competition, U.S. software developers continue to dominate the world market.[23]

In the market, the look and feel of software may be of tremendous importance to the developer and is often of greater commercial value than the programming code that implements it.[24] While traditionally a program's look and feel has been an item of commercial value, microcomputer markets are moving toward "standard user interfaces" among programs,[25] *i.e.*, software developers apply the same principles and techniques of a single user interface to the various programs developed for a computer. In effect, standardized interfaces dramatically reduce the time it takes to learn a new application program. Similar functions and commands are executed similarly, so users do not have to learn a new means of interacting with every new program. The result is that, in markets with standard user interfaces, programs are *expected* to look and feel the same.

Given this understanding of the technology and its market, the following sections examine available forms of federal intellectual property protection for computer software audiovisual look and feel.

II. THE LANHAM ACT OF 1946

> [T]here is no part of the law which is more plastic than unfair competition, and what was not reckoned an actionable wrong 25 years ago may have become such today.
>
> — Learned Hand[26]

The Lanham Act[27] codifies the federal law of trademarks in the United States. Section 43(a) of the Lanham Act[28] prohibits the false

23. *See* O'Connor, *Don't Expect Japan's Star to Rise on the Software Industry Horizon*, San Jose Mercury News, Feb. 12, 1989, at 1F, col. 1. "For all their efforts elsewhere, the Japanese have yet to unravel the enigmatic software business, and it doesn't appear likely they will anytime soon." *Id.* (assessment of Heidi Roizen, president of the Software Publishers Association). "The Japanese, Roizen maintains, don't grasp many aspects of this process and fail to deliver in key respects, such as user interfaces." *Id.* at 1F, col. 3.

24. Beutel, *supra* note 6, at 2 ("So called 'Human Factors Engineering' has become a critical and increasingly expensive aspect of new software development"); *see also* Ranney, *'Look and Feel' Discussed as Major Copyright Issue*, InfoWorld, Nov. 11, 1985, at 13.

25. *See* Bonner, *User Interface Wars: The Next Wave*, PC COMPUTING, Nov. 1988, at 74 ("By all accounts, standardized graphics-based operating environments will rule the computer marketplace by the early 1990's").

26. Ely-Norris Safe Co. v. Mosler Safe Co., 7 F.2d 603, 604 (2d Cir. 1925) (Hand, J.), *rev'd*, 273 U.S. 132 (1927).

27. 15 U.S.C. §§ 1051-1127 (1988). Unlike the Patent and Copyright Acts, constitutional authority for the Lanham Act comes from the Commerce Clause. Trade-Mark Cases, 100 U.S. 82, 91 (1879). The Commerce Clause grants Congress the power "To regulate Commerce . . . among the several States. . . ." U.S. CONST. art. I, § 8, cl. 3.

28. 15 U.S.C. § 1125(a) (1988). The section prohibits:

> [U]se in connection with any goods or services, . . . [of] a false designation of origin, or any false description or representation. . . .

designation of a product's origin or a false description of a product's contents.[29] One form of false designation of origin is trade dress misappropriation, *i.e.*, copying a competitor's trade dress[30] in order to capitalize on the reputation of the competitor.

Section 43(a) was intended to establish a uniform federal law of unfair competition.[31] Although there appears to be no case in which a Section 43(a) claim has been litigated in the context of computer software look and feel, one commentator predicts trade dress protection under Section 43(a) may soon be extended to such cases.[32] In light of that prediction, this section analyzes the scope of trade dress protection in the context of computer software look and feel.

A plaintiff seeking relief under a theory of trade dress misappropriation must establish that (1) the trade dress of their product has acquired a "secondary meaning"[33] in the marketplace; (2) there exists a likelihood of confusion on the part of consumers as to the source of the product; and (3) the appropriated elements are "nonfunctional" in nature.[34]

Id. The Trademark Law Revision Act of 1988 amended Section 43(a), effective November 16, 1989, to clarify that false statements about another person's product are actionable. *See* S. REP. NO. 100-515, *reprinted in* 1988 U.S. CODE CONG. & ADMIN. NEWS 5577, 5603.

29. Beutel, *supra* note 6, at 2.

> But [Section 43(a)] should be construed to include only such false descriptions or representations as are of substantially the same economic nature as those which involve infringement or other improper use of trademarks.

Bernard Food Indus. v. Dietene Co., 415 F.2d 1279, 1283 (7th Cir. 1969), *cert. denied*, 397 U.S. 912 (1970). *See also* Truck Equip. Serv. Co. v. Fruehauf Corp., 536 F.2d 1210, 1216 (8th Cir. 1976), *cert. denied*, 457 U.S. 1126 (1982).

30. Trade dress traditionally has been defined as the "packaging, size, shape, color, design, or name which has been affixed to goods or services." Beutel, *supra* note 6, at 3. *See also* Bauer, *A Federal Law of Unfair Competition: What Should Be the Reach of Section 43(a) of the Lanham Act?*, 31 UCLA L. REV. 671, 688 n.70 (1984). In recent years courts have extended trade dress protection to, among other things, imitation of the features of a product where those features are "nonfunctional." *Id.* at 688 n.71.

31. *See* Bauer, *supra* note 30, at 681.

32. Beutel, *supra* note 6, at 3.

33. A plaintiff might not be required to establish secondary meaning if the trade dress of their product is "inherently distinctive." *See* Chevron Chem. Co. v. Voluntary Purchasing Groups, Inc., 659 F.2d 695, 702 (5th Cir. 1981), *cert. denied*, 457 U.S. 1126 (1982). *Accord* AmBrit Inc. v. Kraft, Inc., 812 F.2d 1531, 1535 (11th Cir. 1986), *cert. denied*, 481 U.S. 1041 (1987); Blau Plumbing, Inc. v. S.O.S. Fix-it Inc., 781 F.2d 604, 608 (7th Cir. 1986).

34. *See* Fuddruckers, Inc. v. Doc's B.R. Others, Inc., 826 F.2d 837, 842 (9th Cir. 1987). *See also* Beutel, *supra* note 6, at 3.

A. Secondary Meaning

Trade dress has secondary meaning if, in the minds of the public, the primary significance of a product feature or term is to identify the source of the product rather than the product itself.[35]

There is no telling how long it might take consumers to associate a particular trade dress with a given producer. However, courts have noted that the velocity with which reputations may be acquired or lost differs among industries.[36]

Consumers of computer software might well associate the look and feel of certain software products with a particular developer as the source of that software. One commentator claims this is the case with the Macintosh interface, "[which is] clearly closely associated with Apple Computer."[37] This claim is untenable, however. Since virtually all software developers for the Macintosh have adopted Apple's standard user interface for Macintosh software products, the look and feel of such products tells consumers nothing as to who is the source of the product. The developer might be Apple Computer, Microsoft, or any of hundreds of different software developers who market products for the Macintosh computer. Consumers may associate the Macintosh interface with Apple Computer in some manner, but they will not assume that Apple Computer is the source of every product using the interface.

Secondary meaning is more likely to attach in computer markets such as that of the IBM PC, where there has not yet developed a *de facto* standard for user interfaces.[38] Perhaps the best example would be the

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35. Inwood Laboratories v. Ives Laboratories, 456 U.S. 844, 851 n.11 (1981). Moreover, Professor McCarthy described secondary meaning this way:

> Take as an example, a descriptive word like BEST for milk. . . . [The] descriptive connotation [*i.e.*, "highest quality"] is the "primary meaning" of the word "best." Extensive advertising and sales, over a period of time, by the seller of BEST milk may give the word "best" a new and different meaning to milk buyers. . . . That is, BEST serves as a commercial symbol identifying the milk of one source and serving to distinguish that milk from milk sold by all other dairies. . . . This new, trademark function of the descriptive word "best" is called the "secondary meaning" of "best". . . .

1 J. MCCARTHY, TRADEMARKS AND UNFAIR COMPETITION, § 15:2 (2d ed. 1984) (footnotes omitted).

36. *See, e.g.*, Stewart v. Hudson, 222 F. 584 (E.D. Pa. 1915).

> [B]ecause of the rapid development of the automobile business itself, it has produced such an alertness of mind toward everything connected with it, and a readiness and willingness to accept and adopt novelties, that there is the same relative difference in the speed with which the reputation of builders and others may be acquired and lost, and good wills grow up and decline.

Id. at 586.

37. Beutel, *supra* note 6, at 4.

38. This trend is away from this characteristic, however, even in the IBM PC market. *See* Bonner, *User Interface Wars: The Next Wave*, PC COMPUTING, Nov. 1988, at 72.

distinctive interface introduced by Lotus Development Corporation for its spreadsheet product, 1-2-3.[39] It was frequently referred to in the market as the "Lotus" interface, suggesting the required identification between the look and feel of the product and its developer for a finding of secondary meaning.[40]

B. Likelihood of Confusion

> Likelihood of confusion "exists when customers viewing the mark would probably assume that the product or service it represents *is associated with the source* of a different product or service identified by a similar mark."[41]

The likelihood of confusion test, however, does not require proof of actual confusion.[42] What actions a competitor must take to avoid confusion depend on the circumstances; clear labeling of the source may not be enough.[43]

It appears that consumers must be exposed to the look and feel of the relevant software products prior to purchase for the requisite likelihood of confusion to exist.[44] Stated another way, no confusion is likely to occur if consumers never have the opportunity to see, and subsequently be confused by, software audiovisual displays. In the case of mass-marketed software, consumers are generally less sophisticated, the products tend to be low-cost, and the marketing techniques of developers are similar.[45] Such consumers are less likely to have seen the product

39. For an illustration and a description of 1-2-3, *see infra* Appendix, Figures 9-12, and accompanying text.

40. Over time, however, other developers appropriated the interface for various products. The subsequent failure of Lotus to prevent these appropriations could leave it vulnerable on two counts. First, the existence of non-Lotus products using the interface weakens the identification consumers make with respect to Lotus as the sole developer of products with the Lotus interface. Second, inaction by Lotus may subject it to a defense of laches.

41. Fuddruckers, Inc. v. Doc's B.R. Others, Inc., 826 F.2d 837, 845 (9th Cir. 1987) (emphasis in original) (quoting Lindy Pen Co. v. Bic Pen Corp., 725 F.2d 1240, 1243 (9th Cir. 1984) (Lindy Pen 1) (quoting *Alpha Industries*, 616 F.2d at 443) (emphasis added), *cert. denied*, 469 U.S. 1188 (1985)).

42. Truck Equip. Serv. Co. v. Fruehauf Corp., 536 F.2d 1210, 1221 (8th Cir. 1976). However, it may be relevant evidence to support a finding of secondary meaning, *i.e.*, deliberate copying of trade dress suggests that it has secondary meaning, which is why it was copied. *See* Fuddruckers, Inc. v. Doc's B.R. Others, Inc., 826 F.2d at 844.

43. *Compare* Fuddruckers, Inc. v. Doc's B.R. Others, Inc., 826 F.2d 837 (different names of restaurants was not enough to obviate potential confusion) *with* Digital Equip. Corp. v. C. Itoh and Co., 229 U.S.P.Q. 598 (D.N.J. 1985) (brand labelling sufficient to avoid confusion, in light of sophistication of end users, sales methods employed, and high costs of goods).

44. *See* 1 J. McCarthy, Trademarks and Unfair Competition, § 8:2 (2d ed. 1984).

45. Beutel, *supra* note 6, at 4.

demonstrated before purchase. Purchasers may buy solely on the basis of recommendations,[46] packaging, advertising, etc., and never have the opportunity to be confused by the appearance of audiovisual displays.

Nonetheless, where consumers are exposed to the look and feel of software products prior to purchase[47] the potential likelihood of confusion exists.

C. Doctrine of Functionality

The courts, not the Congress, have insisted that protected elements be limited to "nonfunctional" features.[48] The reason for this limitation is an overriding public policy of preventing market monopolization.[49] "[A] product feature is functional if it is essential to the use or purpose of the article or if it affects the cost or quality of the article."[50] Judicial inquiry is addressed to "whether the whole collection of elements taken together are functional."[51] Although courts refuse to protect functional features, "functional elements that are separately unprotectable can be protected together as part of a trade dress."[52]

Is computer software look and feel functional? As a product feature, it certainly plays a "functional" or "utilitarian" role. For almost all software programs, a user interface is essential to the use or purpose of software—by definition, it is the means by which the user interacts with the software to achieve the desired result.[53]

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46. Perhaps "vicarious" exposure might result, when the person on whom the buyer relies for a recommendation has been exposed to the product's look and feel in some way.

47. For example, exposure may take the form of a product demonstration before purchase, or "screen shots" in brochures, advertising, or press reviews of the product.

48. *See In re* Morton-Norwich Prods., 671 F.2d 1332, 1336 (C.C.P.A. 1982); *In re* Mogen David Wine Corp., 328 F.2d 925, 932 (C.C.P.A. 1964) (Rich, J., concurring).

49. *See In re* Deister Concentrator Co., 289 F.2d 496, 504 (C.C.P.A 1961); Truck Equipment Serv. Co. v. Fruehauf Corp., 536 F.2d 1210, 1219-20 n.12 (8th Cir. 1976). *See also* Bauer, *supra* note 30, at 688 n.71.

A monopoly exists when there is only one seller. *See* R. COOTER & T. ULEN, LAW AND ECONOMICS 37 (1988). "Market" monopoly must be distinguished from what might be called a "product" monopoly. Statutory protection under the Lanham, Copyright, and Patent Acts secures certain exclusive rights in a product to producers, authors, and inventors. They are protected as the sole source of the product, and therefore have a monopoly on the product. Where barriers, such as legal protection, make it impossible for competing firms to enter the market with the same *type* of product, the producer, author, or inventor has a *market monopoly, i.e.*, the supplier and the industry are the same. *See id.* at 38.

50. Inwood Laboratories v. Ives Laboratories, 456 U.S. 844, 850 n.10 (1982).

51. Fuddruckers, Inc. v. Doc's B.R. Others, Inc., 826 F.2d 837, 842 (9th Cir. 1987).

52. *Id.*

53. *See supra* Section I.A.

Perhaps specific features need to be defined more precisely. For example, are "pull-down" menus[54] essential to the use or purpose of software? Probably not. Products have displayed menus in many different ways, and some display no menu at all.[55] They do not affect the "cost" of the product, in the sense of reducing production costs. On the other hand, pull-down menus, as well as look and feel generally, may be said to affect the quality of the product in terms of ease of use, efficacy, or salability.

This "plain language" application of the rule shows that the line between functionality and nonfunctionality "is not brightly drawn in every case."[56] In fact, the distinction is unworkable unless one recognizes, as Judge Rich did in *In re Morton-Norwich Products, Inc.*,[57] that the designation is a legal conclusion, rather than the prerequisite to one. It is necessary to distinguish between *de facto* functionality and *de jure* functionality.[58]

De facto functionality is functionality in the lay sense, *i.e.*, directed toward a use or purpose. As noted above, a feature that is *de facto* functional may or may not receive protection. Similarly, a feature that at one point is nonfunctional may become functional later.[59] *De jure* functionality refers to the legal conclusion: what product features may be copied (*de jure* functional) and what features may be protected (*de jure* nonfunctional).

Given that *de jure* functionality is a conclusion, the question remains as to what considerations precede the conclusion. A single, clear criterion emerges from the case law: whether protection against imitation will unduly hinder the competitor in competition.[60] Courts seek

54. For an illustration and description of pull-down menus, *see infra* Appendix, Figure 14, and accompanying text.

55. Examples of programs that have no menus include operating systems such as MS-DOS and UNIX, some programming languages such as BASIC on the IBM PC, and entertainment programs such as "text adventures." The IBM PC version of WordPerfect, a popular word processor, displays no main menu, although submenus appear after initial commands are selected.

56. Truck Equip. Serv. Co. v. Fruehauf Corp., 536 F.2d 1210, 1218 (8th Cir. 1987).

57. 671 F.2d 1332 (C.C.P.A. 1982).

58. *See In re* Morton-Norwich Prods., 671 F.2d at 1337.

59. *See, e.g.*, Inwood Laboratories v. Ives Laboratories, 456 U.S. 844 (1981) (arbitrary colors, chosen for capsules containing a drug, came to be used by resellers and consumers to distinguish dosages of the drug). In *Inwood Laboratories*, the Supreme Court upheld the district court's finding that the feature was functional, and now that the patent for the drug had expired manufacturers of generic products could produce the drug and had a "legitimate reason" for using the same colors. *Id.* at 858 n.20. It seems unlikely, however, that the result would be the same if the plaintiff's drug had just been released with arbitrary colors, before the market had come to rely on the color markings as a way to distinguish dosages.

60. *See, e.g.*, Aro Mfg. Co. v. Convertible Top Co., 377 U.S. 476, 522 (1963) ("[T]o grant . . . a legally protected monopoly offends the constitutional plan of a competitive

to balance and reconcile the public's interest in making use of a design, the public's interest in "producer identification,"[61] and the originator's interest in being the sole vendor.[62]

This criterion is consonant with the rationale for the doctrine of functionality: to prevent market monopolization.[63] If trade dress protection is available only when such protection allows for effective market competition, then no monopolies will result. Consequently, where competitors may fairly compete without imitating trade dress, protection should be extended to such trade dress *without regard* to metaphysical distinctions between *de facto* functional and *de facto* nonfunctional features.

Applying this test to the look and feel of computer software, we find that situations exist where competition might, and might not, be unduly hindered by trade dress protection. For example, in markets with standard user interfaces, consumers are likely to insist that products adhere to these standards.[64] Products with similar capabilities following the same interface guidelines are expected to have a similar appearance and organization. Broad trade dress protection would prevent effective competition among similar products and result in excessive market power for a vendor. Opportunities for protection in such markets must necessarily be very narrow.

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economy free from patent monopolies except where there are patentable 'Discoveries.' ") (Black, J., dissenting); Sicilia Di Ri Biebow & Co. v. Cox, 732 F.2d 417, 429 (5th Cir. 1984) (ultimate inquiry in functionality analysis is whether protecting a feature will hinder competition), *reh'g denied*, 736 F.2d 1526 (5th Cir. 1984)); *In re* Morton-Norwich Prods. 671 F.2d at 1341 ("the effect upon competition 'is really the crux of the matter' "); Truck Equip. Serv. Co. v. Fruehauf Corp., 536 F.2d at 1218 ("The question in each case is whether protection against imitation will hinder the competitor in competition"); Pagliero v. Wallace China Co., 198 F.2d 339, 343 (9th Cir. 1952) ("Under such circumstances, since effective competition may be undertaken without imitation, the law grants protection"); Avery & Sons v. Meikle & Co., 81 Ky .73, 102, 4 Ky. L. Rptr. 759, 776 (1883) ("Care should be taken not to interfere with the freedom of trade, or to foster monopolies . . .").

61. *See* R. COOTER & T. ULEN, *supra* note 49, at 144-45. The ability to identify a product's producer reduces a consumer's search cost. Moreover, it is probably the case that a generic item is of lower quality than a brand name item. For example, the average quality of various consumer goods fell in the Soviet Union after the abolition of marks identifying the producing plant. *Id.* at 144.

On the other hand, some economists say that resources devoted to product differentiation amount to a social waste, obscuring what are otherwise identical products. *Id.* at 145.

62. *In re* Morton-Norwich Prods., 671 F.2d at 1340; Vaughn Novelty Mfg. Co. v. G. G. Green Mfg. Corp., 202 F.2d 172, 176 (3d Cir. 1953), *cert. denied*, 346 U.S. 820 (1953).

63. *See supra* note 49, and accompanying text.

64. *See supra* Section I.B., for a discussion of the benefits of a standard user interface. For these reasons consumers are likely to shun non-standard products.

Where no standard user interface exists, the argument that user interface features are *de jure* nonfunctional is much stronger. However, the existence of alternative user interfaces is not conclusive. If an interface is particularly efficient, or if for other reasons the only means of effective competition is through imitation,[65] then no protection should be granted.

It appears that Section 43(a) provides a viable cause of action in certain situations, particularly where the appropriation takes place in a market with no standard user interface, where consumers are exposed to the look and feel of software products prior to purchase, and where the grant of protection would not unduly burden competition in the relevant market.

However, the potential importance of trade dress protection for computer software look and feel is limited by two factors. First, copyright protection is likely to remain more attractive as a means of protection to software developers than trade dress. Copyright protection is available at little or no cost, while trade dress protection is not available until sufficient time and marketing efforts have established the necessary secondary meaning. While trade dress protection lasts indefinitely, the minimum duration of copyright protection is already much longer than the expected useful life of most software products.[66] Further, the trade dress rubric of "confusion as to source of the product" results in a narrower scope of protection than copyright.[67]

Second, a trade dress theory of protection is tenable only in a software market without a standard user interface; historically, the IBM PC market has been such a market. The present trend toward standard user interfaces,[68] however, will necessarily tend to limit Section 43(a) claims alleging misappropriation of computer software audiovisual look and feel.

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65. For instance, it may be costly for users to invest the money and time to learn a new user interface. Where a product has enjoyed a very large market share, and where retraining costs are sufficiently high, the market may be unwilling to accept competitive products unless they offer a similar user interface. If protection is granted here, the vendor is given a *de facto* monopoly.

Such a result is, however, inappropriate under trademark law. No returns above those from producer identification should result from trademark protection. *See* Burgunder & Heckman, *An Emerging Theory of Computer Software Genericism*, 2 HIGH TECH. L.J. 229, 230 (1987).

66. *See* CONTU REPORT, *supra* note 10, Appendix H, at H-3 (studies commissioned by CONTU recommended a duration of copyright protection from two to 14 years).

67. *Id.* at 44-45.

68. *See* Bonner, *supra* note 25, at 74.

III. THE COPYRIGHT ACT OF 1976

Copyrightable subject matter is described by the Copyright Act as:

> 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.[69]

Two categories of copyrightable works applicable to computer programs include "literary works" and "audiovisual works."[70] Literary works include the written programming instructions of software as stored on the computer.[71] Computer software video displays are considered audiovisual works.[72]

Audiovisual works are defined as a "series of related images which are intrinsically intended to be shown by the use of machines. . . ."[73] As such, all aspects of computer software displays would ordinarily come within the scope of copyright protection; this includes audiovisual look and feel.[74]

There is an affirmative statutory limit on otherwise copyrightable subject matter, however, and it is discussed in the following section.

A. The Idea/Expression Dichotomy

Section 102(b) of the Copyright Act provides:

> In no case does copyright protection . . . extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery. . . .[75]

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69. 17 U.S.C. § 102 (1988). The enabling constitutional grant of authority comes from the Patent and Copyright Clause of the Constitution: "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. . . ." U.S. CONST. art. I, § 8, cl. 8. This clause contains a grant of authority as well as limitations on that power. *See* Graham v. John Deere Co., 383 U.S. 1, 5 (1965).

70. *See* 17 U.S.C. §§ 101, 102 (1988).

71. *See, e.g.*, Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222 (3d Cir. 1986).

72. *See* Data E. USA, Inc. v. EPYX, Inc., 862 F.2d 204 (9th Cir. 1988); Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870 (3d Cir. 1982); Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986).

73. 17 U.S.C. § 101 (1988).

74. This follows from Professor Nimmer's conclusion that ideas in written form are a writing within the meaning of the Constitution. *See infra* note 76. Even if look and feel involves a synergism of displays, or a "gestalt," it is nonetheless embodied within an audiovisual work.

75. 17 U.S.C. § 102(b) (1988). This section was intended to codify, unchanged, the common law idea/expression dichotomy as a limit on copyrightable subject matter. *See* H.R. REP. No. 94-1476, 94th Cong., 2d Sess. 56-57, *reprinted in* 1976 U.S. CODE CONG. & ADMIN. NEWS 5659, 5670 [hereinafter H.R. REP.].

This limit on copyrightable subject matter is known as the "idea/expression" dichotomy,[76] and has proven itself to be extremely difficult to administer.[77] Judge Learned Hand's famous "levels of abstraction" test[78] shows how a line might be drawn, but does not offer guidance on where to draw it.[79] "Obviously, *no principle* can be stated as to when an imitator has gone beyond copying the 'idea,' and has borrowed its 'expression.' Decisions must therefore inevitably be *ad hoc*."[80]

The difficulty in distinguishing idea from expression should come as no surprise. How is it possible for an idea to exist, except in some expression? How is it possible to excise an idea from its expression without recasting it into another expression, for example by stating the idea more abstractly, or contemplating it in a different medium?[81]

The "unprincipled" nature of these determinations forces courts to grapple with a metaphysical issue.[82] They are set adrift without guidance as to how to separate by law what seems inseparable in fact. *Ad hoc* determinations where no clear criteria exist leave attorneys unable to map for their clients reliable bounds of protection. Further, the uncertainty of protection diminishes the incentive effect for authors and hinders the promotion of useful arts and sciences.

This need not be the case.

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76. This limitation on copyrightable subject matter is an issue of statutory application. Professor Nimmer maintains this is not a requirement of the Copyright Clause of the Constitution:

> [T]here seem to be no valid constitutional grounds for denying to an idea the status of a writing. . . . Within this frame of reference it seems axiomatic, hardly requiring argument or authority, to conclude that an idea in written form is a writing.

1 M. NIMMER, NIMMER ON COPYRIGHT § 1.08[D] (1988).

77. *See* Peter Pan Fabrics, Inc. v. Martin Weiner Corp., 274 F.2d 487 (2d Cir. 1960) (L. Hand, J.); *see also* Knowles & Palmieri, *Dissecting Krofft: An Expression of New Ideas in Copyright?*, 8 SAN FERN. V.L. REV. 109, 126 (1980); Comment, *Broderbund Software, Inc. v. Unison World, Inc.: "Look and Feel" Copyright Protection for the Display Screens of an Application Microcomputer Program*, 13 RUTGERS COMPUTER & TECH. L.J. 105, 108 (1987).

78. *See* Nichols v. Universal Pictures Corp., 45 F.2d 119, 121 (2d Cir. 1930).

79. *See* 3 M. NIMMER, NIMMER ON COPYRIGHT § 13.03[A] (1988).

80. Peter Pan Fabrics, Inc. v. Martin Weiner Corp., 274 F.2d at 489 (emphasis added).

81. "O body swayed to music, O brightening glance, How can we know the dancer from the dance?" W. B. YEATS, *Among School Children*, in W. B. YEATS: THE POEMS 217 (Finneran ed. 1983).

82. Whether particular ideas and expressions have merged has been called a "somewhat metaphysical issue." Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1253 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

B. Refocusing the Idea/Expression Analysis

This comment proposes a new focus for analyzing the limits of copyrightable subject matter found in Section 102(b).[83] The proposal is this: courts should distinguish a "*de jure* idea" from a "*de facto* idea." Where the grant of copyright protection to a feature would unduly hinder competition within the market for a writing, the feature should be held a *de jure* idea and dedicated to the public domain. Protection would unduly hinder competition when society's interest in competitive markets outweighs society's interest in rewarding the author.

This proposal reflects a test of balancing, not metaphysics, that is required by the very rationale of distinguishing idea from expression. It is consonant with the purpose of copyright law: to create the most efficient balance between society's interest in competitive markets, and incentives[84] for the production and dissemination of information.[85] Further, it is fully consistent with the Copyright Clause of the Constitution. As Justice O'Connor states:

> The Patent [and Copyright] Clause itself reflects a balance between the need to encourage innovation and the avoidance of monopolies

83. A similar proposal advocates the adoption by copyright law of trademark's doctrine of genericism in the context of computer software. *See* Burgunder & Heckman, *An Emerging Theory of Computer Software Genericism*, 2 HIGH TECH. L.J. 229 (1988). Proving "genericism" would require a more rigorous showing of anticompetitive effect than would "*de jure* functionality" or its counterpart, "*de jure* idea" as discussed here.

84. Conventional economics theory holds that where it is costly to prevent non-paying beneficiaries from consuming a commodity, the private market may provide sub-optimal amounts of the public good. R. COOTER & T. ULEN, *supra* note 49, at 113. However, "the standard theory ignores the possibility that there may be alternative, less direct means" for rewarding innovation. *Id.* at 114. In the case of software look and feel, developers may be sufficiently motivated to innovate where their main interest is selling a software program, or computer, rather than a user interface *per se*. *See* Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281, 344-345 (1970).

85. *See* Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d 1222, 1235 (3rd Cir. 1986); Digital Communications Assoc. v. Softklone Distributing Corp., 659 F. Supp. 449, 458 (N.D. Ga. 1987). To the extent that there are other purposes of copyright law this proposal is not inconsistent. Other purposes are "to promote learning, culture and development." Whelan Assocs. v. Jaslow Dental Laboratory, 797 F.2d at 1235.

The purpose is to grant enough, but not too much, protection such that, in the long term, optimal amounts of "ideas" are produced *and* available for public use. *See* R. COOTER & T. ULEN, *supra* note 49, at 135.

> A copyright law, . . . may represent one way of resolving the conflict between the need for book revenues high enough to secure adequate production and book prices low enough not to interfere with widespread dissemination of what is written.

Breyer, *supra* note 84, at 282.

See also infra note 159 (discussing whether a further purpose of the idea/expression dichotomy might be to make patentable and copyrightable subject matter mutually exclusive).

which stifle competition without any concomitant advance in the "Progress of Science and the useful Arts."[86]

This general form of analyzing the scope of copyrightable subject matter has several advantages. First, it focuses on considerations that courts are much more experienced at resolving, making it administrable.[87] Second, the focus in no way departs from the wording or the purpose of the Copyright Act; rather this proposal adds the necessary gloss to Section 102(b). Third, this analysis will promote the progress of useful arts and sciences by balancing the need to encourage innovation with the need to foster markets for such work. Finally, this analysis will result in greater predictability of protection.[88]

Applied to computer software look and feel, the proper analysis requires placing the subject matter in the context of its market. Where a market has adopted a standard user interface, the use of such standards in software design becomes essential to effective competition. In such a market, courts should recognize a virtual *per se* rule: the general look and feel of computer software audiovisual displays is a *de jure* idea and unprotectable.[89]

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86. Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 109 S.Ct. 971, 975 (1989) (O'Connor, J.).

87. Evaluating the effects on competition should be more familiar territory for courts than deciding whether a window "exploding" from an icon in a computer display is an idea or the expression of one. (For an illustration of this phenomenon, *see infra* Appendix, Figure 14, and accompanying text.)

88. While decisions would continue to be *ad hoc*, they would involve judicial inquiry into competition, not metaphysics, and consequently litigants should be better able to predict trial outcomes.

Predictability may be all there is to the law. "The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law." O.W. HOLMES, JR., COLLECTED LEGAL PAPERS 173 (1920).

Further, predictability of protection will itself promote free trade.

> One well-confirmed result in the literature on bargaining is that bargainers are more likely to cooperate when their rights are clear, and less likely to agree when their rights are ambiguous.

R. COOTER & T. ULEN, *supra* note 49, at 100 (footnote omitted).

89. This approach is appropriate in a dispute between competing software developers in a single computer market, such as that of the Macintosh. A more difficult question arises in a case where, for example, a company such as Apple Computer claims software developers for other computers infringe the copyrights Apple holds in software products it developed for its computers. Enforcing Apple's copyright claims will not unduly hinder competition in the market for Apple's software products (since the alleged infringers have developed products for other computers). However, since Apple is asserting its rights beyond the Macintosh market, it is appropriate to analyze the competitive effects of protection on all markets in which Apple asserts its claims. (That greater market sphere of "microcomputers," however, cannot be characterized at this time as having adopted a standard user interface; where such alternative means of producing competitive user interfaces exists, protection for Apple's copyrights is less likely to unduly burden competition.)

More specifically, consider two uses of "icons" in the Macintosh interface. "Disk" icons[90] display a small graphic image selected by the developer that appears on screen and identifies the disk when it is inserted into the computer. The graphic images can be fanciful. Another form of icon, a "tool" icon,[91] exists when a program is running, and the icon represents a certain command or function that is available. For instance, a "paint" program for drawing pictures might have a column of icons that represent tools to draw boxes, circles, ovals, freehand strokes, lines, and so on. The purpose of these icons is to represent the capability without words, using only small pictures.

Protection for original disk icons would probably not hinder competition at all. Protection for original tool icons might present a different problem. There may be very few ways to represent a software command or function, or there may be many ways to represent it but only a few that effectively convey to a user the command or function represented by the icon. If protection for certain tool icons would allow a less-than-acceptable number of developers to monopolize the only effective means of expressing the capability of a certain tool, the tool icons should be a *de jure* idea and unprotectable.[92]

Where a market has no standard user interface, however, competitors can generally compete effectively without copying a competing product's look and feel. The wide competitive playing field justifies a wider scope of protection for authors in such markets. On the other hand, circumstances may exist in these markets where protection would nonetheless unduly hinder competition. The extraordinary success of a product might result in formidable barriers to entry. For example, a vast installed base of users may be unwilling to purchase similar products with different user interfaces because of retraining costs. At some point, society's interest in competition in that market will no longer tolerate the

90. For an illustration and description of the type of disk icons discussed here, *see infra* Appendix, Figure 14, and accompanying text.

91. For an illustration and description of a tool icon, *see infra* Appendix, Figure 16, and accompanying text.

92. At this point it is worthwhile to distinguish the analysis of this proposal from a traditional inquiry of whether idea and expression have merged. Merger denies protection to an expression whenever there is only one way, or very few ways, to express an idea. This comment proposes an analysis that would deny protection when, *for any reason*, such protection would unduly hinder competition. There may be *de facto* ideas capable of expression in myriad ways, only one of which is palatable to the market. Similarly, there may be a *de facto* idea that can be expressed in only one way, but because of the availability of substitutes or for other reasons is protectable because such protection will not unduly hinder competition in a generally defined market.

This "icon" example demonstrates how a competition-oriented analysis produces results that are consistent with precedent, yet avoid the problems of metaphysical analysis.

use of copyright protection as a means of perpetuating market domination.

In conclusion, copyright law should shield original works of authorship; that shield should not, however, be misapplied as a barrier to market entry.

IV. THE PATENT ACT OF 1952

The law of patents in the United States is governed by the Patent Act of 1952.[93] Two different forms of patents are relevant to this issue and will be discussed separately: utility patents and design patents.

A. Utility Patents

Thomas Jefferson[94] drafted the first description of proper subject matter for utility patents, and the substantive statutory requirements have seen little change since the Patent Act of 1793.[95] Section 101 of the Patent Act of 1952 defines patentable subject matter as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof. . . ."[96] Committee reports accompanying the Patent Act indicate that Congress intended statutory subject matter to include "anything under the sun that is made by man."[97]

This broad scope of patentability is narrowed, however. Congress has relied on the Patent Office and the judiciary to resolve questions of subject matter patentability on a case-by-case basis, providing only the barest statutory guidance.[98] Consequently, subject matter patentability is shown by coming within the plain language of the statute and avoiding areas excepted by the judiciary.[99]

93. 35 U.S.C. §§ 101-376 (1982 & Supp. V 1987).

94. While Jefferson was active in establishing the patent system after the adoption of the Constitution, authorship of the empowering constitutional provision has been attributed to James Madison and Charles C. Pinckney. *See* Fenning, *The Origin of the Patent and Copyright Clause of the Constitution*, 11 J. PAT. OFF. SOC'Y 445 (1930).

95. Annotation, *Patentable Subject Matter*, 65 L. Ed. 2d 1197, 1200 (1980).

96. 35 U.S.C. § 101 (1982).

97. Annotation, *supra* note 95, at 1202.

98. Davis, *Computer Programs and Subject Matter Patentability*, 6 RUTGERS J. OF COMPUTERS & LAW 1, 7 (1977).

99. *See, e.g.*, Parker v. Flook, 437 U.S. 584, 588 (1977) ("The plain language of Section 101 does not answer the question").

Patent applications for computer programs are generally made in the form of "process" claims.[100] The following sections will analyze such claims and the relevant judicial doctrines of exclusion.

1. *PROCESS CLAIMS*

The Patent Act defines process to mean "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material."[101] A dictionary definition of the term includes "a particular method of doing something, generally involving a number of steps or operations."[102]

A plain reading of the statute suggests that the *de facto* functional, interactive aspects of a program's user interface constitute a process—for example, the process of making a greeting card in *Broderbund Software, Inc. v. Unison World, Inc.*[103] Computer "implemented processes are encompassed within 35 U.S.C. [§] 101 under the same principles as other machine implemented processes, subject to judicially determined exceptions. . . ."[104] The question, then, is whether the judiciary will except such a process from the statutory definition.[105]

2. *JUDICIALLY DETERMINED EXCEPTIONS*

Three doctrines potentially relevant to computer software look and feel exclude mathematical algorithms, printed matter, and mental steps from patentable subject matter.[106]

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100. U.S. PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2106 (5th ed. rev. 9, Sept. 1988).

An "apparatus" claim will be analyzed as a process claim unless it can be demonstrated the apparatus claim is drawn to a specific machine, distinguishable from other machines capable of performing the identical functions. *In re* Pardo, 684 F.2d 912, 916 n.6 (C.C.P.A. 1982); *see also In re* Walter 618 F.2d 758 (C.C.P.A. 1980). For the purposes of this paper, only the general process claim analysis will be discussed, recognizing a slightly different analysis might apply where a claim is drawn to a specific apparatus.

101. 35 U.S.C. § 100(b) (1982).

102. WEBSTER'S NEW UNIVERSAL UNABRIDGED DICTIONARY 1434 (2d ed. 1983).

103. 648 F. Supp. 1127 (N.D. Cal. 1986). Part of this process is illustrated and described in the appendix; *see infra* Appendix, Figures 1-7.

104. *In re* Johnson, 200 U.S.P.Q. 199, 210-11 (C.C.P.A. 1978). *See also* PATENT AND TRADEMARK OFFICE, *supra* note 100.

105. The look and feel-related patents that have been issued are evidence that the Patent Office considers such processes proper subject matter for utility patents. *See supra* note 5.

106. In particular factual situations, other doctrines of exclusion might be implicated, such as those pertaining to abstract ideas or methods of doing business.

a. Mathematical algorithms

This doctrine has been relevant in the few cases on patents involving software to reach the Supreme Court. The Court's last decision on the issue, *Diamond v. Diehr*,[107] was the first Supreme Court case in which a patent including a computer program was upheld as within Section 101 patentable subject matter. In *Diehr*, the Court applied the test of *In re Freeman*.[108]

The first step of the *Freeman* test is to determine whether the claim directly or indirectly states an algorithm.[109] *If so*, the second step is to analyze the claim to ascertain whether, in its entirety, it wholly preempts the use of that algorithm (in which case it is nonstatutory subject matter).[110] In the case of look and feel, we never reach the second step of the *Freeman* test. A user interface does not directly or indirectly state a (mathematical) algorithm. Its implementation may involve the use of mathematical formulae in programming, but it would probably not depend on any one algorithm as a means for implementing the screen displays.[111] Such programming issues are transparent to the user and unnecessary in describing or implementing the process.

Diehr, as well as the Patent Office's Manual of Patent Examining Procedure,[112] provides guidelines on the patentability of computer programs when they involve an algorithm. They are silent, however, on how to analyze claims that do not involve algorithms. The conclusion is that this doctrine, which involves the only Supreme Court pronouncements on the patentability of software-related inventions, will not exclude computer software look and feel from patentable subject matter.

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107. 450 U.S. 175 (1981) (process for curing rubber which includes in several steps the use of a mathematical formula and a programmed digital computer).

108. 573 F.2d 1237 (C.C.P.A. 1978).

109. The Court has used the term "algorithm" in the sense of a "procedure for solving a given type of mathematical problem. . . ." Gottschalk v. Benson, 409 U.S. 63, 65 (1972).

110. *In re* Freeman, 573 F.2d at 1245; *see also* White & Redano, *Patent Opportunities for Software-Related Subject Matter*, 4 COMPUTER LAWYER, July 1987, at 13.

The second step of the *Freeman* test has been modified by *In re* Abele, 684 F.2d 902 (C.C.P.A. 1982) and *In re* Walter, 618 F.2d 758 (C.C.P.A. 1980).

111. *See, e.g.*, Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp. 1127 (N.D. Cal. 1986), where defendant copied plaintiff's audiovisual look and feel without, for all intents and purposes, access to plaintiff's source code; defendant "reverse engineered" the program.

112. U.S. PATENT AND TRADEMARK OFFICE, *supra* note 100.

b. Printed matter

In the case of computer programs, both the written source code and the audiovisual displays are arguably printed matter. Historically, patents were denied when the sole distinction over the prior art involved printed matter.[113] The rationale was that printed matter did not relate to the physical structure of the invention and therefore was not within the scope of the patent statute.[114]

Where printed matter relates to the physical structure of the invention, however, courts have upheld the patentability of such inventions. For example, an accounting system utilizing columns covered with movable strips of paper was treated as a "structure," rather than printed matter, and held to be patentable.[115] Similarly, an educational mathematical device in the form of a band containing digits printed at certain intervals could not be excluded from patentable subject matter simply because the differences between the invention and prior art were to be found in the content of printed matter.[116]

Computer software source code and audiovisual displays play active, essential, *de facto* functional roles in the operation of the computer and any process implemented thereby. In particular, dynamic audiovisual displays in a user interface play a structural role analogous to the movable strips of paper in *In re Hansen.*[117] Consequently, as a general rule, the look and feel of computer software should not be excluded from patentable subject matter on the grounds that the invention takes the form of printed matter.[118]

c. Mental steps

In the 1940's the "mental steps" doctrine gained express recognition in the Patent Office, Ninth Circuit Court of Appeals, and the Court of Customs and Patent Appeals, and excluded processes composed of

113. *See In re* Hansen, 154 F.2d 684, 686 (C.C.P.A. 1946); *In re* Sterling, 70 F.2d 910, 912 (C.C.P.A. 1934). *See also In re* Miller, 418 F.2d 1392, 1396 (C.C.P.A. 1969).

114. *In re* Hansen, 154 F.2d at 686.

In early decisions, it appears that most attempts to patent printed matter involved arrangements of information designed to implement a business system; consequently the development of the printed matter exclusion was closely related to the doctrine excluding methods of doing business from patentable subject matter. *See* Chisum, *The Patentability of Algorithms*, 47 U. PITT. L. REV. 959, 965 (1986).

115. *In re* Hansen, 154 F.2d at 685.

116. *In re* Gulack, 703 F.2d 1381, 1383 (Fed. Cir. 1983).

117. 154 F.2d at 685.

118. Two commentators, after discussing *In re Gulack*, declared: "This holding could be characterized as an affirmance of the potential patentability of 'look and feel' presentations of data." White & Redano, *supra* note 110, at 20 (1987).

"purely mental steps" from patentable subject matter.[119] Some cases suggested that a patentable process must operate to transform and reduce matter to a different state or thing.[120] "It is self-evident that thought is not patentable."[121]

When the issue of patents involving software arose in the 1960's, the Patent Office refused to allow such applications, relying in part on the mental steps doctrine.[122] Software-implemented processes might fall into the doctrine's scope of exclusion since a process taking place wholly within a software program would not necessarily operate to transform and reduce matter to a different state or thing.[123] One might analogize the steps executed in a computer program to a "thought process" that could be performed mentally by a human.

Look and feel-related processes, on the other hand, arguably transform audiovisual displays and reduce them to a different state; for example, the manipulation of phosphors by cathode rays to create video displays on a computer monitor could provide the necessary nexus to physical matter to make such processes patentable.[124] The process reflected in computer software look and feel cannot fairly be likened to a situation where a human could readily achieve the same result with pen and paper. A human might mentally follow the programming steps in software source code (with great difficulty), but the only practical value of following such steps in the case of computer software look and feel is to implement a user interface on a computer.

119. 1 D. CHISUM, PATENTS, § 1.03[6] (1988); Gottschalk v. Benson, 409 U.S. 63, 67 (1972).

120. *See, e.g.*, Cochrane v. Deener, 94 U.S. 780, 788 (1877). Professor Chisum maintains that this language in *Cochrane* was dictum, and when taken in context was intended as an inclusive description, not a preclusive description (*i.e.*, processes that operate in such a way are patentable, but are not the only processes that may be patented). *See* Chisum, *supra* note 114, at 967 n.30.

121. *In re* Abrams, 188 F.2d 165, 168 (C.C.P.A. 1951). In discussing this case, Professor Chisum cautions that "[o]ne must naturally be leery of a proposition which a court can justify only by reference to its self-evident truth." Chisum, *supra* note 114, at 968 n.35.

122. *See* Bender, *Computer Programs: Should They be Patentable?*, 68 COLUM. L. REV. 241, 255-56 (1968).

123. For example, this objection was avoided in Diamond v. Diehr, 450 U.S. 175 (1980), where software and computers were used in conjunction with other steps and devices to cure rubber. A process manifest in the audiovisual displays of a computer software program, however, is not likely to reduce physical matter to a different state or thing. *But see infra* note 124, and accompanying text.

124. One might argue this example goes too far and would make such things as television shows patentable. Television shows as such, however, are not fairly called processes, and therefore do not come within the broad language of 35 U.S.C. § 101. On the other hand, a user interface implemented through audiovisual displays is fairly called a process.

> It seems beyond questions that . . . computers . . . are in the technological field. . . . How can it be said that a process having no practical value other than enhancing the internal operations of those machines is not likewise in the technological or useful arts?[125]

While convincing arguments may be made that look and feel-related patents would not violate the traditional mental steps doctrine, such arguments may be unnecessary. The continued existence of the doctrine has been called into question,[126] and its viability is discussed below.

From 1969 to 1972, the Court of Customs and Patent Appeals dismantled the mental steps doctrine while reviewing software-related applications rejected by the Patent Office.[127] As stated in *In re Musgrave*:[128]

> We cannot agree with the board that these claims (all the steps of which can be carried out by the disclosed apparatus) are directed to non-statutory processes 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, in our view, to make a sequence of operation 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."[129]

The C.C.P.A. noted that the exclusion of "purely mental steps" from patentable subject matter might lead to a correct result if construed to encompass only those steps which are incapable of being performed by a machine; the fact that machine-implemented steps could also be performed by a human mentally did not make them "purely mental steps."[130]

Surprisingly, the Supreme Court's subsequent decision in *Gottschalk v. Benson*[131] made a fleeting reference to the unpatentability of "[p]henomena of nature, . . . *mental processes*, and abstract intellectual

125. *In re* Benson, 441 F.2d 682, 688 (C.C.P.A. 1971), *rev'd*, Gottschalk v. Benson, 409 U.S. 63 (1972).

126. *See* Chisum, *supra* note 114, at 967-92; von Spakovsky, von Spakovsky & Graffeo, *The Limited Patenting of Computer Programs: A Proposed Statutory Approach*, 16 CUMB. L. REV. 27, 31 (1985-1986).

127. *See* Chisum, *supra* note 114, at 969 (citing *In re* Musgrave, 431 F.2d 882 (C.C.P.A. 1970); *In re* Mahony, 421 F.2d 742 (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), *reh'g*, 415 F.2d 1393 (C.C.P.A. 1968)).

128. 431 F.2d 882 (C.C.P.A. 1970).

129. *In re* Musgrave, 431 F.2d at 893. The court in *Musgrave* noted that steps involving the exercise of subjective judgment without restriction might violate the definiteness of disclosure requirements in 35 U.S.C. § 112. *Id.*

130. *In re* Musgrave, 431 F.2d at 889-90.

131. 409 U.S. 63 (1972).

concepts. . . ."[132] Professor Chisum suggests that this "disturbingly terse" reference to the mental steps doctrine may have been inadvertent and not intended to discard developments in the C.C.P.A.[133] The reference is made without a discussion of, or even citation to, the lower court cases on the mental steps doctrine. "It is quite irregular for any court to accomplish so much by a short, ambiguous, dogmatic statement."[134]

The Supreme Court's decision in *Parker v. Flook* quoted the *Benson* language,[135] but identified it as the "established rule that a law of nature cannot be the subject of a patent."[136] Earlier in the *Flook* opinion, the Court referred to the argument that a patentable process must operate to change materials to a different state or thing;[137] however, the Court appears to disclaim this view without actually rejecting it. "As in *Benson* we assume that a valid process patent may issue even if it does not meet one of these qualifications of our earlier precedents."[138]

Two years later in *Diamond v. Diehr*,[139] the Supreme Court stated: "Excluded from such patent protection are laws of nature, natural phenomena, and abstract ideas."[140] The Court cited *Flook* and *Benson*, and yet omitted reference to "mental processes." The *Diehr* Court then stated that *Flook* and *Benson* stood for no more than the long-established rule that "principles" were not patentable processes.

> "[A] new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter. Likewise, Einstein could not patent his celebrated law that $E=mc^2$; nor could Newton have patented the law of gravity."[141]

This suggests that the use of the term "mental processes" in *Benson*, and as quoted by *Flook*, was never intended to refer to the mental steps doctrine.[142] It would appear that, for all intents and purposes, the mental steps doctrine has not been squarely before the Supreme Court

132. Gottschalk v. Benson, 409 U.S. at 67 (emphasis added).
133. Chisum, *supra* note 114, at 981.
134. *Id.*
135. *See supra* note 132, and accompanying text.
136. Parker v. Flook, 437 U.S. 584, 589 (1978).
137. *Id.* at 588 n.9 (citing Cochrane v. Deener, 94 U.S. 780, 787-88 (1876)).
138. *Id.*
139. 450 U.S. 175 (1981).
140. Diamond v. Diehr, 450 U.S. at 185.
141. Diamond v. Diehr, 450 U.S. at 185 (quoting Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980) (quoting Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130 (1948))).
142. Professor Chisum notes that "a process consisting partially or wholly of 'mental steps' does not exist in nature and can be quite specific"; consequently there was no basis for the Court in *Benson* to lump mental steps with phenomena of nature or abstract concepts. *See* Chisum, *supra* note 114, at 981.

since the doctrine was repudiated by the C.C.P.A. in the late 1960's and early 1970's.

Lower court decisions, both before and after *Diehr*, have upheld the patentability of computer programs that do not appear to change materials to a different state or thing.[143] Thus, the current state of the law appears to be that as stated in *Musgrave, i.e.*, a process is not made unpatentable simply because some or all of the machine-implemented steps could also be performed by a human mentally.[144]

Consequently, the mental steps doctrine should not survive to exclude look and feel-related processes from statutory subject matter. Alternatively, if the doctrine does survive, the Court should hold that look and feel-related processes have a sufficient nexus to the transformation of matter and the technological arts to avoid the exclusive effect of the mental steps doctrine.

In conclusion, it appears that computer-implemented processes involving audiovisual look and feel are within the statutory scope of patentable subject matter and are not categorically excluded by the judicial doctrines relating to mathematical algorithms, printed matter, or mental steps. These inventions, if they meet the further requirements of the Patent Act such as novelty,[145] nonobviousness,[146] and disclosure,[147] are the proper subjects of valid patents.

B. Design Patents

The first design patent law was enacted in 1842 and defined subject matter as "any new and original design for a manufacture, whether of metal or other material or materials" or any of a list of items, such as for the printing of fabrics, design for a statue, any ornament to be placed on an article of manufacture, etc.[148] In 1902 it was amended to define

143. *See In re* Pardo, 684 F.2d 912 (C.C.P.A. 1982) (a means of allowing a computer to process commands in any order received, rather than sequentially); *In re* Taner, 681 F.2d 787 (C.C.P.A. 1982) (a seismic prospecting method); *In re* Toma, 575 F.2d 872 (C.C.P.A. 1978) (a means of translating between natural languages, *e.g.*, from Russian to English); *In re* Freeman, 573 F.2d 1237 (C.C.P.A. 1978) (a process of typesetting using concatenation points to position characters); *In re* Chatfield, 545 F.2d 152 (C.C.P.A. 1976), *cert. denied*, 434 U.S. 875 (1977) (a time sharing method for operating computer programs simultaneously); Paine Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, Inc., 564 F. Supp. 1358 (D. Del. 1983) (a methodology to effectuate a highly efficient business system).

144. *In re* Musgrave, 431 F.2d 882, 889-90 (1970). *See also supra* note 129, and accompanying text.

145. 35 U.S.C. § 102 (1982).

146. 35 U.S.C. § 103 (1982 & Supp. V 1987).

147. 35 U.S.C. § 112 (1982).

148. Act of August 29, 1842, ch. 263, § 3, 5 Stat. 543, 544.

subject matter as "any new, original, and ornamental design for an article of manufacture" and eliminating the enumerated items.[149] The courts have added a further requirement to the statutory language: designs that are primarily functional or dictated by functional considerations are not proper subject matter for design patents.[150]

The Patent Office granted the first design patents for computer displays on May 10, 1988 to Xerox Corporation.[151] United States Design Patent No. 296,339, dated June 21, 1988, states as its claim the "ornamental design for an icon for freehand drawing softkey display or the like, as shown and described." This demonstrated that the Patent and Trademark Office believed design patentability tests, including subject matter, had been met.[152] One commentator proclaimed that "Xerox has discovered a new form of protection for the 'look and feel' of software."[153]

This novel development warrants further analysis; the scope and requirements of design patent protection are discussed further in the following sections.

1. *ARTICLE OF MANUFACTURE*

The term "article of manufacture" has been construed broadly. In the case of a design patent claim for a water fountain with rotating sprays, the court held "a manufacture is anything made 'by the hands of man' from raw materials, whether literally by hand or by machinery or by art. Certainly the fountains are so made."[154] Computer monitors are made this way as well, and consequently their ornamentation (including audiovisual displays appearing on the monitor) is likely to be included within a broad construction of the term "article of manufacture."

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149. *See* 35 U.S.C. § 171 (1982).

150. *See* Powers Control Corp. v. Hybrinetics, Inc., 806 F.2d 234 (D.C. Cir. 1986); *see also* 1 D. CHISUM, PATENTS § 1.04[2][d] (1988).

151. Kluth & Lundberg, *Design Patents: A New Form of Intellectual Property Protection for Computer Software*, 5 COMPUTER LAWYER 1 (Aug. 1988).

152. It appears that the Patent and Trademark Office has since reversed its opinion, and currently maintains that computer software video displays are not within the statutory subject matter of design patents. Statement of Gerard Goldberg, Group Director, Group 230, U.S. Patent and Trademark Office, at Prentice-Hall Conference on Patent Protection for Computer Software: The New Safeguard, in San Francisco, Cal. (September 25, 1989).

153. *See* Kluth & Lundberg, *supra* note 151, at 1.

154. *In re* Hruby, 373 F.2d 997, 1000 (C.C.P.A. 1967).

2. *NONFUNCTIONAL ORNAMENTAL DESIGN*

"Ornamental implies that the design must be the product of aesthetic skill and artistic conception."[155] However, a design that is "primarily functional" or "dictated by functional considerations" is not proper subject matter for design patents.[156] There are two reasons for this rule of functionality. First, where function dictates configuration, there is no ornamental creativity.[157] "It was certainly not the intent of the law to grant monopoly to purely conventional design which is in itself little more than a necessary response to the purpose of the article designed."[158] Further, design patent protection for functional features would in effect grant a utility patent, while circumventing Section 101 subject matter requirements.[159]

Computer software look and feel is often the product of aesthetic skill and artistic conception;[160] in most cases "aesthetic quality is critical."[161] The question is whether look and feel is "primarily functional"

155. *See* Kluth & Lundberg, *supra* note 151, at 3.

156. Powers Control Corp. v. Hybrinetics, Inc., 806 F.2d 234 (D.C. Cir. 1986).

157. D. CHISUM, *supra* note 150.

158. Applied Arts Corp. v. Grand Rapids Metalcraft Corp., 67 F.2d 428, 430 (6th Cir. 1933) (invalidating a design patent covering a combination ash receiver and electric lighter for use in automobiles).

159. D. CHISUM, *supra* note 150.

It is unclear whether this concern for protecting the scope of utility patent protection extends to the Copyright Act or the Lanham Act.

A strong argument may be made that the statutory scope of protectable subject matter is mutually exclusive in the case of utility patents and copyrights. The Constitution expressly distinguishes between science, authors, and writings on the one hand, and useful arts, inventors, and discoveries on the other. *See* U.S. CONST. art. I, § 8, cl. 8. Further, the codification of the idea/expression dichotomy expressly excludes from copyright protection any "process" or "discovery," mirroring the Patent Act and its constitutional grant of power. *See* 17 U.S.C. §102(b) (1988).

Nonetheless, courts have often held that patent, copyright, and trademark laws stem from different concepts, offer different kinds of protection, and are not mutually exclusive. *See In re* Penthouse Int'l, 565 F.2d 679, 683, n.3 (C.C.P.A. 1977). *See also* 1 J. MCCARTHY, (TRADEMARKS AND UNFAIR COMPETITION § 6:1 (2d ed. 1984).

The Lanham Act, on the other hand, was enacted under a broader authority: the Commerce Clause. *See* Trade-Mark Cases, 100 U.S. 82, 91 (1879). Decisions regarding trademark law's doctrine of functionality do not reflect a deference to the Patent Act; rather they are concerned with the effect of protection on competition. *See supra* Section II.C. Consequently, a process which was also a product feature could conceivably qualify for both trade dress and utility patent protection.

160. *See, e.g.*, Broderbund Software, Inc. v. Unison World, Inc., 648 F. Supp 1127, 1134 (N.D. Cal. 1986) ("The . . . designer of any program that performed the same functions as 'Print Shop' had available a wide range of expression governed predominantly by artistic . . . considerations"); *see also infra* Appendix, Figures 1-7 (illustrations of "Print Shop").

161. Presentation by Cathy Hemingway, Ph.D., at the West Coast Computer Fair, in San Francisco, Cal. (March 17, 1989) (Dr. Hemingway is Vice President of Sobell Associates and a user interface consultant to Sun Microsystems).

or "dictated by functional considerations." Here again we encounter what is a test of metaphysics.[162] Fortunately, the rationale for the distinction here appears to be the same as that in the case of trade dress and copyright law: the scope of legal protection must be balanced against society's interest in competitive markets.[163] Further, design patent law may not be used as a means of attaining what amounts to a utility patent.[164]

3. *REFOCUSING THE FUNCTIONAL/NONFUNCTIONAL ANALYSIS*

This comment proposes that courts applying design patent law adopt a concept of *de jure* functionality.[165] The ornamental design of an article of manufacture is *de jure* functional if protection would unduly hinder competition, without regard to the *de facto* functional or *de facto* nonfunctional nature of the design. Additionally, the subject matter of utility patents is *de jure* functional, and not the proper subject matter of design patents. However, if protection for an ornamental design is not an attempted "end run" around utility patent protection, and further would not result in the undue hindrance of competition, then such protection should be upheld as valid.

Whether the scope of protection in Xerox's design patents extends to the look and feel of the audiovisual displays remains uncertain. In fact, it was the Xerox Star interface that was the inspiration for the Macintosh interface.[166] The recently patented screens by Xerox may bear a familial relationship to the Macintosh interface and virtually all graphics-based user interfaces available. If that familial similarity suggests that design patents could be used by Xerox to secure judgments or injunctions against virtually all major software developers (and thereby bestow market monopoly power on Xerox), then the patents should be

162. Compare the requirement here of "nonfunctional" to that of trademark law ("nonfunctional"), *see supra* Section II.C., and that of copyright law ("expression, not idea"), *see supra* Section III.A.

163. *See supra* notes 49 and 85, and accompanying text.

164. Although design patents are subject to the additional tests of novelty, nonobviousness, etc., these tests are applied to the subject matter of the design patent (the ornamentation). Where, as a practical matter, protection of ornamentation also results in protection of subject matter within the scope of utility patents, a utility patent-in-effect is obtained, while only the ornamentation, not the machine or process, has been evaluated for novelty, nonobviousness, and so on.

165. For the source of this distinction, see the discussion of the doctrine of functionality in trademark law, *see supra* Section II.C., and accompanying text. For a similar proposal made by this comment in the context of copyright's idea/expression analysis, see *supra* Section III.B.

166. *See* Parker & Flynn, *Apple/Microsoft Suit Ruling Fails to Clear Contract Issue*, InfoWorld, Mar. 27, 1989, at 93, col. 5.

adjudicated invalid. On the other hand, if granting protection to Xerox would protect their interest without unduly burdening competition, then the ornamental features of the patented displays should be *de jure* nonfunctional, and validly protected.[167]

Further, if Xerox's audiovisual displays embody a look and feel that is within the scope of utility patent subject matter,[168] and protection for that aspect of the user interface is not disclaimed in the design patent they received, then the patent should be adjudicated invalid with respect to those aspects.

CONCLUSION

The myriad ways in which computer programs manifest themselves make them unamenable to *per se* rules of protection or exclusion from federal sources of intellectual property protection. Consequently, courts are forced to distinguish between various manifestations in a program, often applying rules that on their face require a metaphysical separation of what otherwise seems inseparable. This approach frequently leaves courts, counsel, and clients without reasoned principles to guide their actions.

A better approach is to abandon metaphysics and analyze each case in light of the rationale for the rule. If, in the case of trade dress, the rationale of limiting protection to nonfunctional features is to protect our interest in producer identification without unduly hindering competition, then we may safely protect trade dress *as long as* competition has not been unduly hindered.

The rationale for distinguishing idea from copyrightable expression is to promote writings by rewarding authors, without unduly hindering competition for such works. Consequently, we may safely reward the author by protecting an aspect of her work *as long as* competition in the market for such works is not unduly hindered.

Finally, the rationale applies to design patents, with further deference to the scope of utility patent protection, and the same result should follow. We may safely protect the ornamental design of an article of manufacture *as long as* protection would not unduly hinder competition and would not result in protection for the subject matter of utility patents without meeting the requisite tests.

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167. User interfaces that predate the subject of Xerox's design patents would normally have no reason to fear the patents' validity. Such interfaces would be part of the prior art, and Xerox's work must be sufficiently novel and nonobvious in light of such prior art.

168. See the discussion on this issue *supra*, Section IV.A.

This approach is more administrable for the courts, focusing on more familiar tenets of competitive analysis rather than the metaphysics of new technologies. This approach is wholly consistent with the purpose of the statutory and judicial rules; it cuts to the very rationale of the rules and provides the necessary gloss to statutory language. Further, the results are consistent with the constitutional grant of authority under which the federal statutes are enacted.

APPENDIX:

An Illustrated Guide to Computer Software Audiovisual Look and Feel

This appendix reproduces screen displays from several computer software programs. In some cases, sequences of screens are presented as they would appear to the user in performing some task. These figures and accompanying text are simply examples, and in no way approach the total depth and complexity of the programs' look and feel. The examples are useful, however, in demonstrating the visual appearance of screens and certain dynamic aspects of the displays.

The following products are included in this appendix (identified by product name, publisher, and supported computer):

Table of Contents

Product 1: The Print Shop[169]

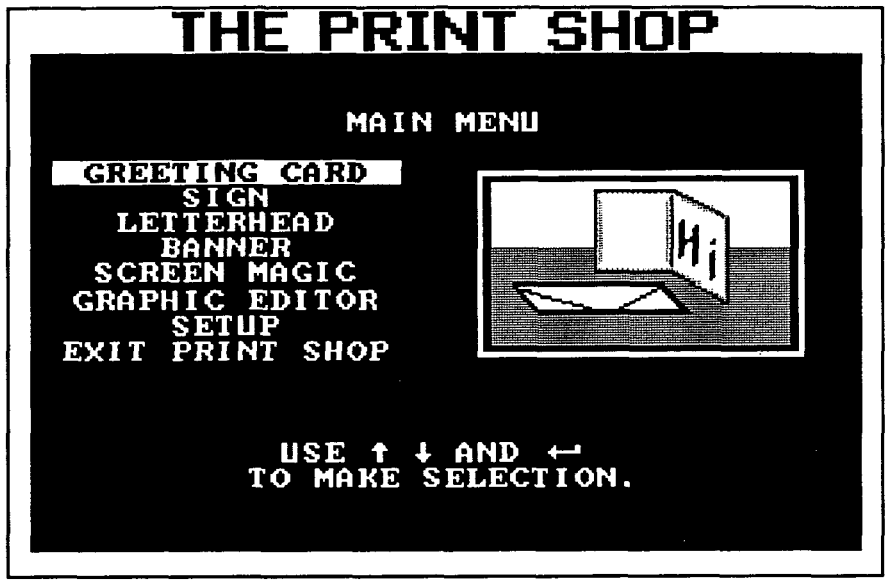

Figure 1

Figure 1 shows the main menu of Broderbund Software's Print Shop product as it appears on the IBM PC. Using directional arrow keys, the user can make a selection by highlighting an item (*e.g.*, "Greeting Card" is highlighted above) and pressing the return key. As the user highlights different selections, the illustration on the right side of the screen is updated to match the current selection. For example, if the user pressed the down arrow key, "Sign" would be highlighted and the illustration to the right would change from a greeting card to a sign.

The following sequence of screens[170] represents only one branch in a tree of different possible steps in using the program. The sequence will represent some of the steps and available choices in creating a computer-generated greeting card with The Print Shop.

169. The Print Shop was the plaintiff's product in Broderbund Software, Inc. v. Unison World, 648 F. Supp. 1127 (N.D. Cal. 1986). The version of The Print Shop for Apple II model computers (not to be confused with the Apple Macintosh) was the copyrighted program held infringed by Unison World's "Printmaster"; the screens shown here are from the IBM version of The Print Shop, but nonetheless are virtually identical to the Apple II version screens.

170. Certain screens in this sequence have been omitted.

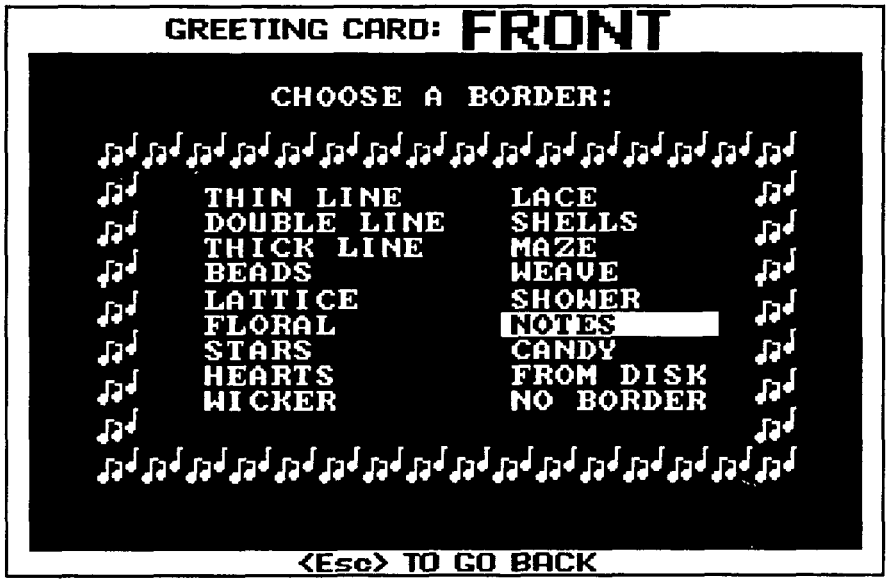

Figure 2

In Figure 1, the user selected "Greeting Card." The screen illustrated in Figure 2 invites the user to select a border for the front of the greeting card. The same method of highlighting an item and pressing return is used to make the selection (in this case, the border "notes"). As different selections are highlighted, a picture of the highlighted border is displayed.

Is the display of a graphic image that correlates to the user's current selection functional or nonfunctional? Is it an idea or the expression of one? Compare the use of illustrations here with illustrations presented in the main menu, *supra*, Figure 1 (a decorative display accompanying otherwise self-explanatory commands such as "Greeting Card"). The illustrations of available borders in Figure 2 provide a *de facto* functional purpose: they allow the user to view a border before selecting it, rather than choosing from just a text description. The illustrations on the main menu in Figure 1 do not seem to serve such a purpose. Illustrations there seem more decorative than *de facto* functional.

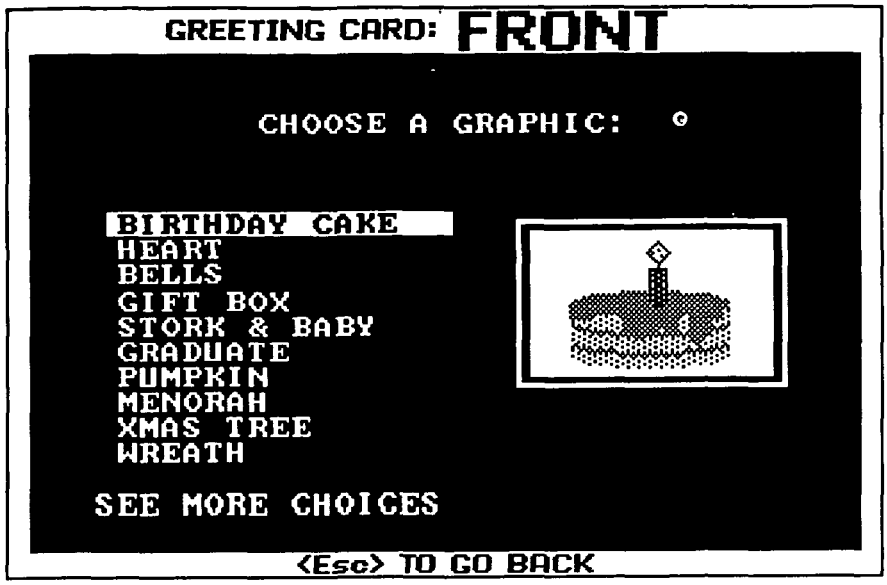

Figure 3

In Figure 3, the user selects a graphic to be used on the front of the greeting card. As the user highlights different selections, the right half of the screen automatically displays a graphic image of the selection (in this case, a birthday cake).

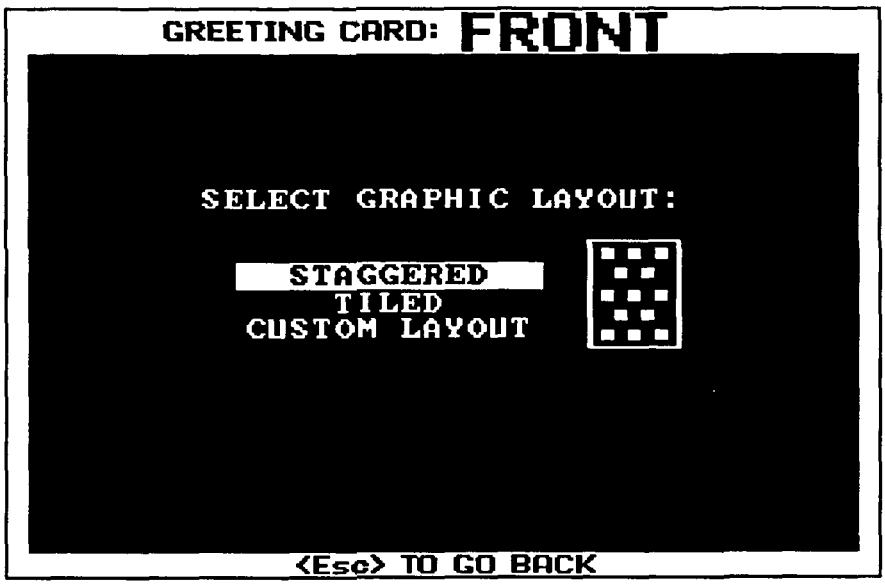

Figure 4

After selecting a graphic for the greeting card front, the user selects where the graphic should appear in Figure 4. In this case the user is selecting a staggered layout, where the image will appear at each location shown in the image to the right.

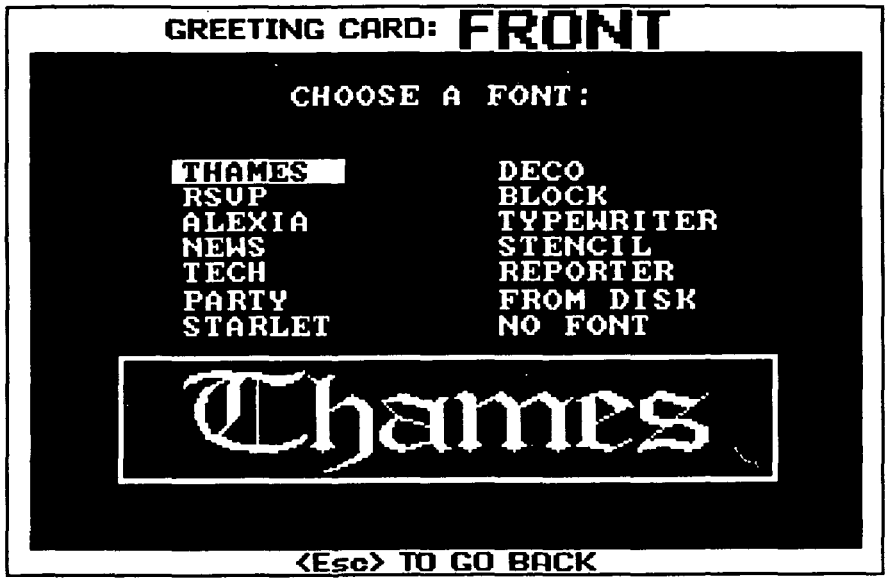

Figure 5

Figure 5 displays the user's choices as to a type style for text to appear on the greeting card. As the user highlights different font names, the corresponding type style is displayed at the bottom of the screen.

Figure 6

The user then types in the text they would like to have appear on the front of the greeting card. (At this point in the program and not shown in this appendix, the sequence shown in Figures 1 through 6 is repeated for the inside cover of the greeting card.)

Figure 7

Once the process is complete, the user has a number of options which include adding a "by" line to the back of the greeting card (by selecting "Give Yourself Credit" as highlighted above), and printing the greeting card on an attached printer.

Product 2: Mirror[171]

```
                    MIRROR Status Screen                    Off-line

NAme   MIRROR Default Settings                  LOaded   STD.XTK
NUmber                                          CApture  Off

Communications parameters                       Filter settings
SPeed  1200  PArity None   DUplex  Full         DEbug    Off   LFauto   Off
DAta   8     STop   1      EMulate None         TAbex    Off   BLankex  Off
POrt   1                   MOde    Call         INfilter On    OUtfiltr On

Key settings                                    SEnd control settings
ATten  Esc                 COmmand ETX (^C)     CWait    None
SWitch Home                BReak   End          LWait    None

                    Available command files

 1) NEWUSER     2) SETUP       3) STD



Enter number for file to use ( 1 - 3 ):
```

Figure 8

Figure 8 displays the "status screen" of the Mirror program for the IBM PC. The product is a communications program; it allows the computer (along with a device known as a modem) to transfer information over phone lines to and from other computers.

The two upper case letters in each command represent the actual keys to be pressed by the user to invoke the command. The user would follow the two keys with other information, if appropriate. For example, "SPeed" (in Figure 8, along the left side of the figure) controls the "baud rate" at which the computer is to communicate, a measure of how quickly information is sent or received. The baud rate might vary depending on the capabilities of the user's computer, as well as the capabilities of the computer on the other end of the phone line. To

171. Mirror was the defendant's "clone" of the Crosstalk communications program in Digital Communications Associates, Inc. v. Softklone Distributing Corp., 659 F. Supp. 449 (N.D. Ga. 1987).

change the speed from its current value above, 1200, to 2400, the user would enter "sp 2400". The status screen would then show 2400 in place of 1200, and the program would instruct the modem to communicate at that rate.

Product 3: Lotus 1-2-3[172]

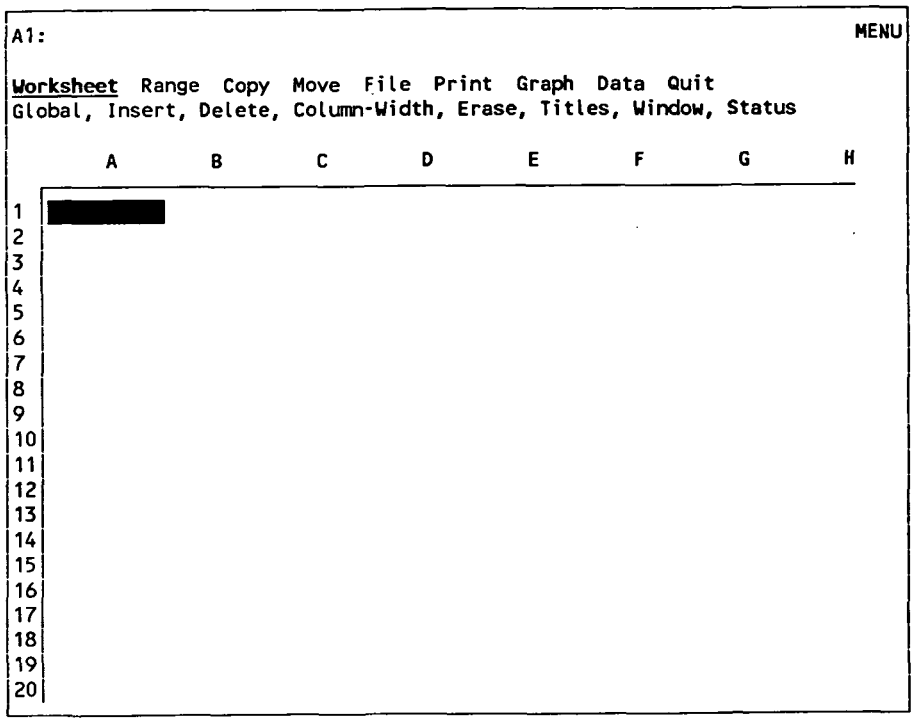

Figure 9

Lotus 1-2-3 is a spreadsheet product for the IBM PC used mainly for business and financial applications, and it is illustrated in Figure 9. Numbers are arranged in columns (A, B, C, etc.) and rows (1, 2, 3, etc.). Certain commands may be used to perform mathematical operations on all or parts of columns, rows, or ranges of columns and rows.

172. By Lotus Development Corporation. This product is the subject of current look and feel litigation in the federal district court for Massachusetts. *See* Lotus Dev. Corp. v. Mosaic Software Inc., No. N87-0074-K (D. Mass. filed Jan. 12, 1987); Lotus Dev. Corp. v. Paperback Software Int'l, Inc., No. N8-0076-K (D. Mass. filed Jan. 12, 1987).

Directional arrow keys on the keyboard are used to position a highlighted cursor anywhere in the spreadsheet matrix. At the very top left corner of the screen is an indicator of the cursor's position (currently at A1, or column A, row 1). Below the indicator is a row of commands. If the user presses the "/" key on the keyboard, the menu will be activated. "Worksheet" will be highlighted when the menu becomes active, and the user may use the directional keys to select another command on the row. As different commands are highlighted, the row of text below the commands changes to describe further choices or features the particular command offers.[173] For example, selecting "Worksheet" will allow the user to access the "Column-Width" command. The following screens show the structure, sequence and organization of displays that appear when a user performs the simple task of changing the width of a column.

173. Compare this dynamic updating technique (displaying information about a command when it is highlighted) to the similar phenomenon in the Print Shop, *supra* Figures 1 and 2.

```
A1:                                                                    MENU

Global  Insert  Delete  Column-Width  Erase  Titles  Window  Status
Set display width of the current column

      A       B       C       D       E       F       G       H
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
```

Figure 10

After selecting "Worksheet," a submenu appears as shown in Figure 10, replacing the main menu. With the directional arrow keys, the user can highlight "Column-Width" and see a description of the command. If the user wishes to execute the command, she presses the return key.

```
A1:                                                                    MENU

Set  Reset
Set width of current column

      A        B        C        D        E        F        G        H
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
```

Figure 11

After selecting the Column-Width command, the screen in Figure 11 appears. Selecting Set will allow the user to specify a width for the column. Selecting Reset will return a previously resized column to the standard size.

```
A1:                                                          POINT

Enter column width (1..72):20

          A         B         C         D         E         F
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
```

Figure 12

At this point (after selecting the Set command), the user enters a numeric value for the width (in characters) of the column, or uses the directional arrow keys to expand or contract the column width. (In the upper right corner, the word MENU in prior screens has changed to POINT; this indicates to the user that she may use either the arrow keys to "point" to a desired column-width, or type in a numeric value.) Once set, the user presses return. Then the lower spreadsheet area becomes active again and the menu area is deactivated.

Product 4: Apple Macintosh Finder[174]

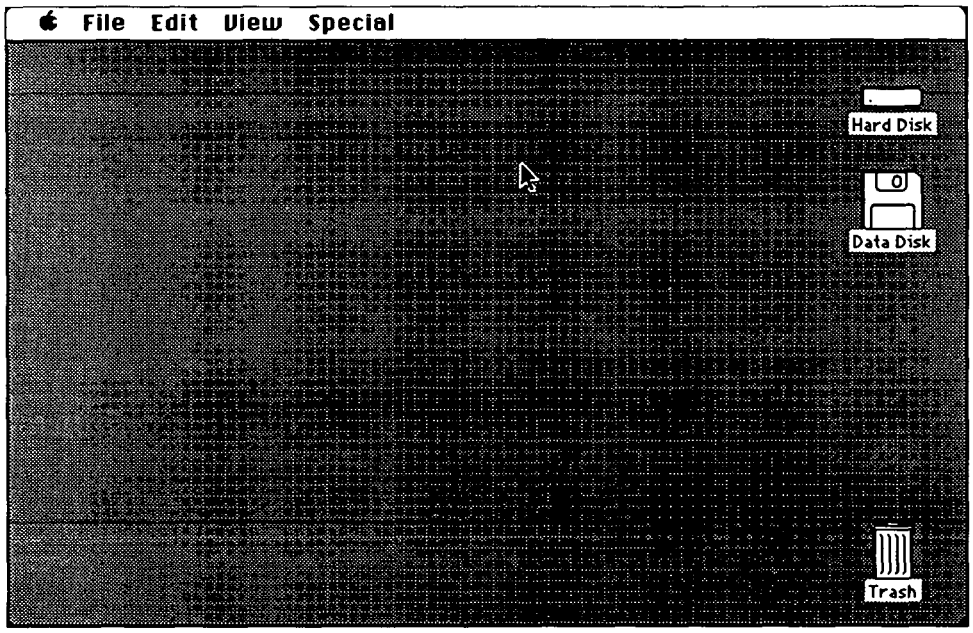

Figure 13

Apple Computer publishes Finder (and MultiFinder) for its Macintosh line of computers. Finder is the Macintosh operating system.[175] When a Macintosh user starts her computer, she may see something like Figure 13. In the center of the screen is an arrow, or cursor, which moves in response to movements of a device called a "mouse." When the user moves the hand-held mouse in any compass direction, the cursor will move accordingly. The cursor is used in conjunction with four main elements of the interface: pull-down menus, icons, windows and dialog boxes.

174. The Macintosh "Finder" is the plaintiff's product in litigation pending in the federal district court for the Northern District of California. *See* Apple Computer, Inc. v. Microsoft Corp. and Hewlett Packard, No. C-88-20149-RPA (N.D. Cal. March 20, 1989).

175. Operating system software controls the interaction of the various components of the computer system, such as the central processing unit, memory devices, and other software programs.

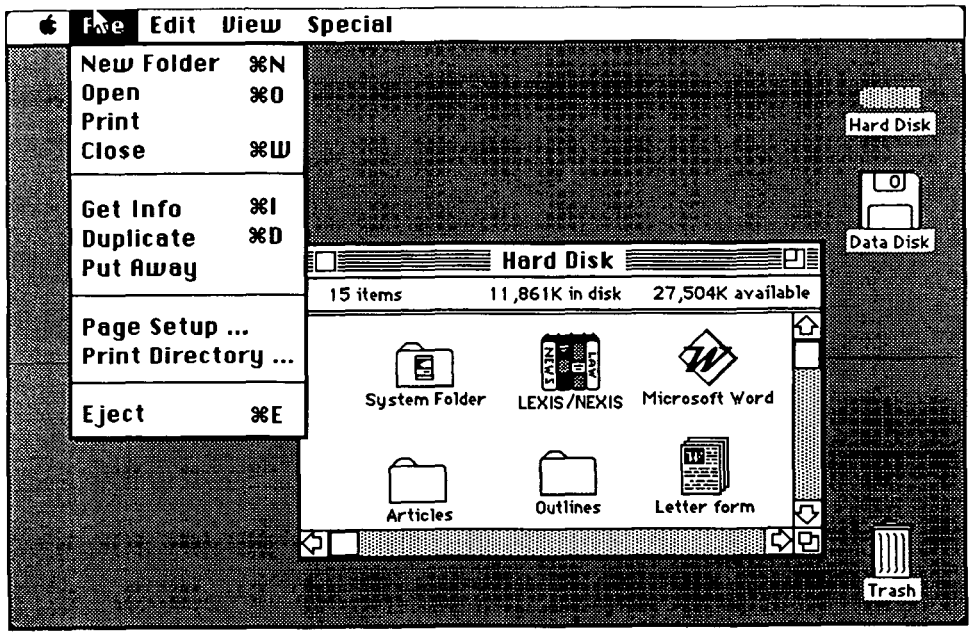

Figure 14

A. PULL-DOWN MENUS

At the top of the screen appears the "menu bar." If the user moves the cursor over one of the commands on the menu bar and presses the mouse button, a submenu can be "pulled down," and a submenu item selected. The commands available here (as in most operating systems) relate to starting programs, copying files, deleting files, and so on.

B. ICONS

To the right appear "disk icons." (Icons are also used to represent files and certain functions, as discussed below.) A disk is a form of magnetic media, similar in function to a cassette tape, used to store software programs and data in "files." As the user removes and adds disks, the screen updates to display the appropriate disk icon and disk name.

Below the disk icons appears the celebrated "trash can" icon, used for deleting unwanted information. By pointing to a file icon, the user can "drag" it over to the trash can and throw it away.

C. *WINDOWS*

Figure 14 shows the use of a "window" to display the contents of a disk, in this case the computer's hard disk (a hard disk is a mass storage device which can hold many times the amount of information stored on a floppy disk). When the user selects a disk for viewing, a very brief animation sequence appears in which the window "explodes" from the disk.

Files normally appear as icons (although the viewer may select other viewing options). Certain icons, such as "LEXIS/NEXIS" and "Microsoft Word" are software programs. Below the LEXIS/NEXIS icon appears a file folder given the name "Outlines," which may contain a number of additional program or data files. Below the Microsoft Word icon appears the data file "Letter Form."

On the right and bottom borders of the window appear "scroll bars." These can be used to view areas of the disk that are not currently displayed within the confines of the window.[176] For example, by moving the small box that appears in the vertical scroll bar, the display of the disk contents moves up or down. Alternatively, the user could resize the window to any sort of rectangle using the small icon at the very lower right corner of the window.

The window could be repositioned elsewhere on the screen by pointing to the very top bar of the window (the title bar) and "dragging" the window to a new location. The simple square icon in the upper left corner of the window is used to close the window, *i.e.*, it "implodes" in an animation sequence back into the disk icon. A similar icon to the far right is used to return a window to its original size and location after it has been changed.

D. *DIALOG BOXES*

Figure 15, *infra*, displays a dialog box. Usually dialog boxes appear after the user has selected a command that requires some additional information before it can be executed. The mouse is used to select certain options and provide the necessary information; there is a "dialog" between the software and the user as to what exactly should be done.

Virtually all software for the Apple Macintosh, whether developed by Apple Computer or third party developers, conforms to user interface guidelines promulgated by Apple Computer. The following figures present examples of how those standards are manifest in common

176. Note that 6 file or folder icons appear in the window, but the upper left corner of the window states that there are "15 items" altogether stored on the disk.

application programs; the examples include one product by Apple Computer, and two products by a third party developer, Microsoft.

Product 5: Microsoft Word[177]

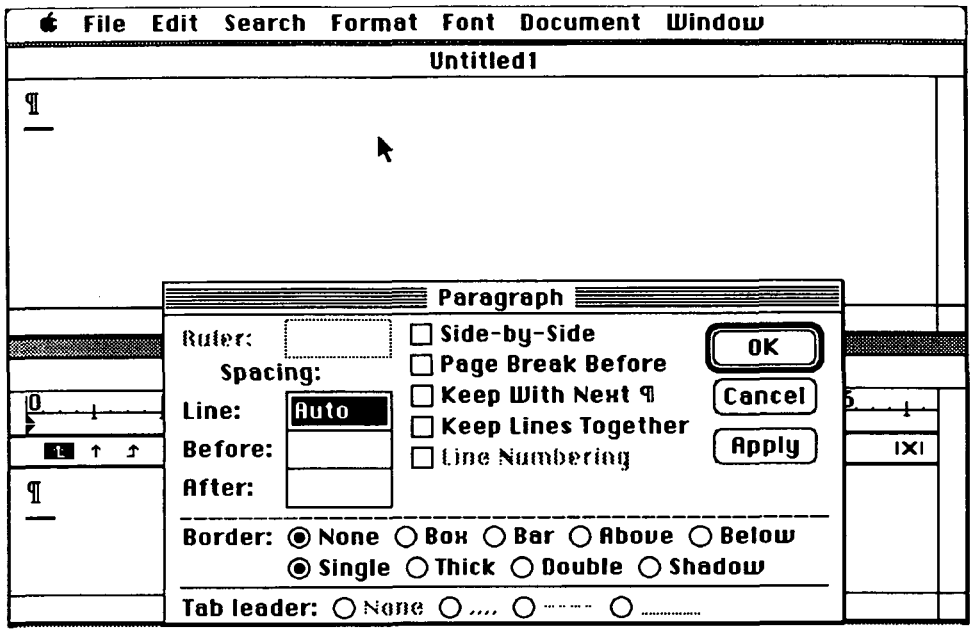

Figure 15

Figure 15 displays a working screen from Microsoft Word for the Apple Macintosh. The image titled "Paragraph" is not a window but a dialog box. In this case, the user selected a command from a pull down menu to change certain attributes of text paragraphs. The dialog box allows the user to select certain options and set certain controls.

Behind the dialog box appear two data windows. The user may type in text in either document, copy from one to another, and save them separately as files. When the dialog box is gone, one of the windows will become active again, and the scroll bars seen in Figure 14 will reappear.

177. Microsoft Word for the Macintosh computers is not the subject of litigation between Apple Computer and Microsoft; the litigation relates to Microsoft Windows, a product for IBM microcomputers, and similar in function to the Macintosh Finder. *See* Apple Computer, Inc. v. Microsoft Corp. and Hewlett Packard, No. C-88-20149-RPA (N.D. Cal.)

Product 6: MacPaint[178]

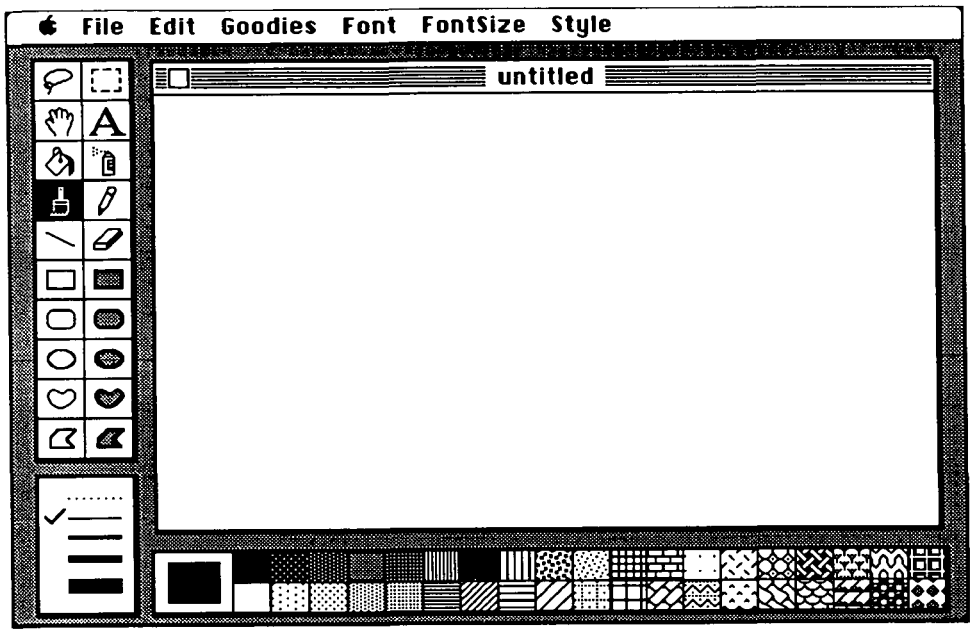

Figure 16

Figure 16 is a screen from MacPaint. A "paint" product allows the user to create pictures on screen, and then save them to disk, print them, or even incorporate them into the text of a document. On the left side of the screen appear "tool icons." The tool icons represent various drawing features. For example, above the currently selected paintbrush is a spilling can of paint; this feature is used to fill an enclosed area completely. The hand icon is used to move the drawing and access areas not displayed within the window (as an alternative to using a window with scroll bars).

At the lower left corner, the user can select various line thicknesses to draw with, and to the right appears a palette of patterns with which to draw.

178. MacPaint was originally developed and marketed by Apple Computer. Apple has since created a subsidiary, Claris, to continue marketing and development efforts for Apple software.

Product 7: Microsoft Excel

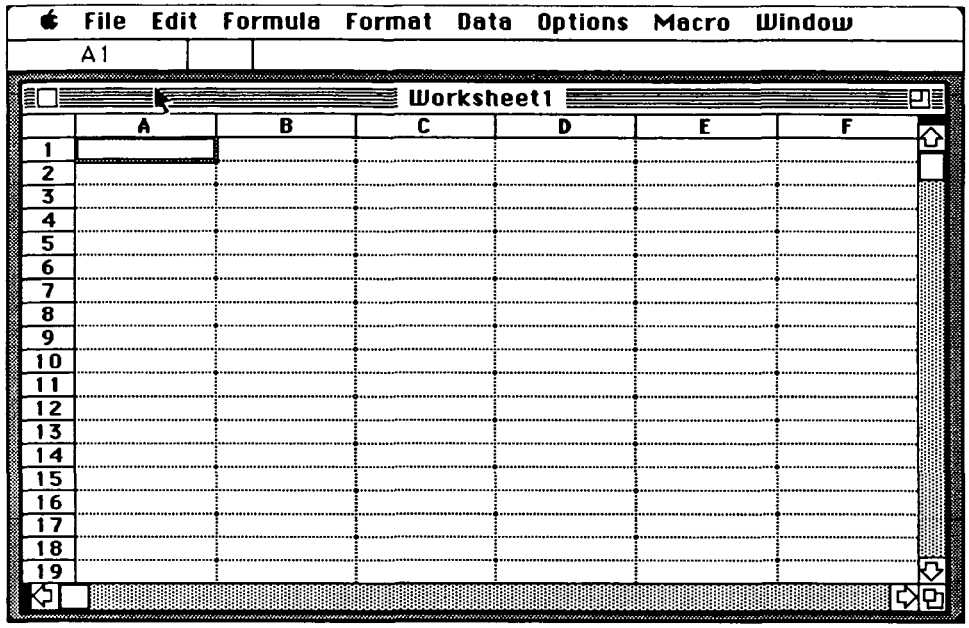

Figure 17

Figure 17 displays a screen from the Macintosh version of Microsoft Excel, a spreadsheet program similar in function to Lotus 1-2-3. Below the pull-down menu bar is an area for showing the active cell in the spreadsheet, in this case "A1" (column A, row 1). A conventional window is used to display the spreadsheet, and scroll bars may be used to view areas of the spreadsheet that are off-screen.[179]

179. Compare the "look" of Microsoft Excel with Lotus 1-2-3, *supra* Figures 8-12.

BOOK REVIEW

ISSUES IN COMPUTER-ASSISTED CONTRACTING

IL CONTRATTO CONCLUSO MEDIANTE COMPUTER
[THE CONTRACT FORMED VIA COMPUTER]
By Francesco Parisi
Published by CEDAM, Padova, Italy, 1987
Distributed through Casalini Libri,
Via Benedetto da Maiano No. 3,
50014 Fiesole (Firenze), Italy.
Pp. ix, 140; $20.00

Reviewed by STEFAN NAUMANN †

INTRODUCTION

To ensure that an agreement will be considered legally binding, it should be evidenced in writing. In spite of this general evidentiary rule, many agreements are either not written or are written without covering all of the important aspects of the transaction.[1] Historically, the courts have responded by enforcing oral contracts only where the behavior of the parties sufficiently points to the existence of an agreement.[2] However, the statute of frauds prevents the enforcement of certain types of unwritten agreements even where the parties' behavior does point to the existence of a contract.

As new commercial practices developed over the years and the contracting parties no longer routinely met face to face, additional legal difficulties developed.[3] While agreements increasingly were made in writing, they often remained incomplete, even as the legal complexity of the agreements became more pronounced. Today, a California party can reach an agreement with a New York party via mail, telegraph, or telex

† Candidate for J.D., 1990, Boalt Hall School of Law, University of California, Berkeley; B.A. 1986, Harvard.

1. In particular, the consequences of a breach or the burden of risk are passed over in order not to upset the agreement the parties have reached.

2. Partial performance, acceptance of tendered performance, etc.

3. F. PARISI, IL CONTRATTO CONCLUSO MEDIANTE COMPUTER [THE CONTRACT FORMED VIA COMPUTER], 51-52 (1987).

involving a transaction to take place in a third state. The correspondence exchanged in anticipation of such multi-state deals frequently does not address the plethora of legal problems which can occur in the course of performance.[4]

Even where parties use standard forms which cover all or most aspects of an agreement, legal problems arise where the standard forms do not reflect the parties' intent. When standard forms do not address material issues or contain incompatible clauses, the courts must decide whether an agreement exists at all and, if so, which terms apply.

Both common law and civil law systems have attempted to adapt the existing legal framework to reflect emerging commercial practices brought on by technological innovations. Where the new commercial practices cannot be fit into existing legal categories and rules, both legal systems require legislative intervention to fashion a new legal framework which the courts can then apply. However, the American judiciary, drawing on a large body of judge-made precedent, has traditionally been innovative in fashioning "interstitial legislation" absent legislative action.

One of the most difficult questions posed by a civil law system is how to fit new technology-induced commercial practices into a rigid legal structure composed of comprehensive codes. Major societal changes may require the code to be rewritten, a long and complex endeavor which usually spans decades. A more limited method of adaptation is to supplement the code with specialized provisions governing the new practices. The problem with supplementation is that the civil and commercial codes of many European countries are already so riddled with special provisions for particular industries or particular types of litigation that they are no longer workable.

A third approach is to interpret the existing legal scheme in such a way as to encompass the new practices. In a civil law system, the courts are less free to fill the gaps in the statutory scheme enacted by the legislature. While the courts often establish standard interpretations of statutes, decisions usually do not refer to prior cases. Instead, the courts rely on scholarly writing and academic comment about prior cases, particularly where the law is in a state of flux.

The value of Mr. Francesco Parisi's book, *Il Contratto Concluso Mediante Computer*[5] [The Contract Formed Via Computer], for the American practitioner is twofold. The book reflects and has helped shape current thinking in Italian legal circles on the computer's legal effect on

4. In the above example, the parties might not negotiate a choice of law clause, or a clause specifying where the contract was made.

5. F. PARISI, *supra* note 3.

contract formation.[6] The book will be of particular importance for those trying to gauge the Italian Supreme Court's thinking on the subject. A committee of the Supreme Court debated various approaches to the subject put forward by scholars and found Mr. Parisi's approach particularly persuasive.[7] It is therefore possible that the Italian Supreme Court would use the approach recommended by the book when and if it is called upon to decide a case involving the use of computers in the formation of a contract.[8] No cases on the subject have yet been litigated in the Supreme Court of Italy.

Also, and perhaps more importantly, the rigor of Mr. Parisi's analysis can help the American scholar or practitioner define and focus his or her own thinking on the topic. Though Mr. Parisi's analysis is set in a very different legal system, the requirements of the Italian law regarding the formation of a binding contract are substantively similar to those developed under American common law.[9] Italian lawmakers, like their American counterparts, have struggled with the issues of what constitutes a contract and how it can be verified in court, and have developed similar substantive solutions.

Mr. Parisi's book addresses the issues raised by the uses of computers and computer networks in the formation of contracts. The author analyzes how existing legal rules can or cannot be applied to various types of computerized contract formation processes. What is the effect of an automated purchasing system on the legal requirement that the parties involved must have the intent to contract? How do evidentiary rules apply to electronic documents? The two main issues with which the author is primarily concerned are contractual intent and the legal sufficiency of proof as to the content and source of an offer or acceptance made through a computer.

6. Fourth International Congress on Data Processing and Legal Regulations, Sess. III, n. 11, Corte Suprema di Cassazione, Rome, May 16-21, 1988. At the Fourth International Congress on Data Processing and Legal Regulations held in Rome in May, 1988, Mr. Parisi was extensively cited in the findings of the Committee of the Italian Supreme Court which sponsored the Congress.

7. *Id.*

8. In civil law systems, in the solutions of cases not contemplated in the codes and in the statutes, courts will often look to treatises and sometimes cite them as secondary authority; *see supra* p. 2.

9. Requirements of offer and acceptance, evidentiary requirements, requirements of intent and ability to contract, etc.

SYNOPSIS

The author is interested in two crucial stages of the contract formation process. The first is the formation of a contractual intent by an actor and the legal consequences that flow from the intent being implemented by a computer. When a user programs a computer to transmit an offer, the actual offer might be issued by the machine months later, and worse, under completely changed circumstances, possibly even after the death of the person in whose interest the computer was operating. The second stage is the formation of the contract itself, when two actors wish to contract and the computer pairs the actors' terms, thereby creating a binding contract.

The book is divided into four parts. This review will focus on Parts I and II. Parts III and IV specifically deal with problems of how to fit the contract made by computer within the existing Italian statutes covering general evidentiary requirements and agency rules as well as rules on contracting, and thus may be of less interest to the American reader.[10]

In Part I, Mr. Parisi identifies four possible uses of the computer in the contract formation process.[11] The first, and most limited use, is that of the computer as data bank. Here, the computer does not externalize or transmit to others its user's intent.[12] Legally, the computer does not effect the contract formation process, since its effects are restricted to the user.

Second, the computer can be used as a means of transmitting its user's intent (offer, acceptance, counter-offer).[13] The evidentiary issues raised by such a use are similar to those raised by other electronic transmission devices, and can be addressed by the legal rules developed in response to the latter's widespread commercial use. However, some characteristics of the electronic document require the courts to evaluate its probative nature in light of existing evidentiary rules. The author develops this aspect in part IV of his book, where he compares the probative value of electronic documents to that of evidence used in cases involving automated banking and telexes.[14]

The third possible use of the computer is to input "the data and algorithms which will regulate its [the computer's] commercial activity and to let it . . . make decisions."[15] In such situations, the computer is not

10. The legal principles regarding these two issues are covered in Parts I and II and are discussed *infra*.

11. F. PARISI, *supra* note 3, at 2-3.

12. *Id.* at 2. The author speaks of *volonta negoziale* [commercial intent].

13. *Id.* at 3-4.

14. *Id.* at 53-55; *see also id.* at 10-16.

15. *Id.* at 4.

only a tool used to carry out the user's specific intent to enter into a contract, but also transmits that intent to other parties and may even "make" the specific decision to contract as a result of its program.[16]

Finally, the computer can be used as a marketplace[17] which actively pairs buyers and sellers. Here the computer is no longer working for a single user. Since the computer has to be neutral as between the contracting parties, only a disinterested third party may program the computer.[18]

Before analyzing the legal implications of the last two uses in depth, the author turns to the evidentiary problems which attach to the use of the computer as a means of communication with others.[19] Electronic documents need to acquire sufficient probative value in court so that their use outside of the courtroom does not create legal uncertainty for the commercial actors who use them.[20] Hence, the identity of the user entering the market via his or her computer must be reasonably certain. In practice, this has meant restricting access to computer terminals within a company to those who know the necessary password and/or possess a magnetic key to access the computer network.[21]

Once an electronic document has been transmitted to others, a record of it needs to be kept on a "non-cancelable" storage system.[22] However, the author notes that the most widely used storage systems are in fact designed to be erasable and reusable, thereby creating evidentiary problems.[23] Hence, he suggests the use of electronic seals, which would protect an electronic document from modification or erasure. The user would attach such a seal to any document to which she wished to give legal or probative value.[24]

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16. *Id.* at 5.

17. The author uses the expression *nuove piazze* [new marketplaces] to characterize the rise of electronic marketplaces. *Id.* at 33.

18. *Id.* at 7.

19. *Id.* at 10-16.

20. Electronic document means the electronically transmitted terms of a contract (quantity, price, etc.).

21. F. PARISI, *supra* note 3, at 11.

22. The author lists optical storage (such as compact discs), mechanical storage (on perforated cards) and photosensitive storage (microfilm) as three prime examples of non-cancelable storage systems. *Id.* at 15. However, even with such storage systems, originals and copies remain indistinguishable. *Id.* at 66.

23. *Id.* at 15. The evidentiary issues raised by the use of these different types of data storage are discussed in Part IV of the book. *Id.* at 64-68. A particularly difficult problem for the law is the use of magnetic storage which, in theory, allows modifications of the data (i.e. of the terms of the contract) where such modifications leave no visible signs that the original document has been tampered with. *Id.* at 73.

24. *Id.* at 15. The problem is discussed more thoroughly in Part IV of the book. *Id.* at 64-68.

In Part II of the book, the author looks at two uses of the computer in which the computer can directly influence or determine the formation of a contract. The first example is that of a department store's automated monitor-purchase system.[25] In this case, the computer keeps track of the goods in stock[26] and orders new goods whenever the available quantities fall below pre-defined levels. The computer then automatically offers to purchase certain quantities at the prices originally programmed by the user.

With such a purchasing program, the user does not decide each purchase separately, but merely programs the levels at which the computer's purchase functions kick in.[27] The critical question is whether there is sufficient intent by the user for her to be bound by an acceptance of the computer's purchase offer. In common law parlance, the question is whether there can be a meeting of the minds where one of the parties possesses only a generic intent to contract[28] and might not even be aware that she entered into the specific contract in question.

The author suggests that the necessary intent to contract exists at the time the computer is programmed to automatically issue purchase orders. The intent to contract is at that time subject to objective variables. By setting those variables at certain values, the user thereby determines the essential terms of a possible contract. She sets out the terms under which she is willing to deal. Since there are no undetermined essential terms, there exists an intent to contract whenever these conditions are met.[29]

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25. *Id.* at 17-23.

26. The computer could keep track of sold goods through the use of a bar code on products which are scanned by the cash registers. The machine could monitor both sales and shelf life of the products. The author notes that a manual check of the stocks is nevertheless necessary to insure that the computer is performing properly and that the computer's numbers reflect losses of stock due to accidents, theft, etc. Such losses would not be reflected by a computer which relies on bar codes to keep track of sold goods. *Id.* at 18-19.

27. The author points out that the users of such programs do not necessarily let the program effectuate their buying and selling without supervision. Where each computer purchase decision is cleared by the user, the computer's use raises no legal issues besides the evidentiary questions mentioned *supra* notes 19-24 and accompanying text, since the user had the specific intent to contract in each individual instance in which she entered the market. How she reached that intent is of no relevance to the fact that she is bound by the terms. However, where the supervision encompasses solely a regular review of the program rather than approval of each of its "decisions," the question of intent and the legal effect of the computer's behavior remain. F. PARISI, *supra* note 3, at 19-22, 33.

28. *Id.* at 21. The author notes that the user is not necessarily the programmer, thus removing the former even further from the intent to contract required under most legal systems for a contract to be binding.

29. *Id.*

The second example is that of a computer used as a marketplace, such as a stockmarket, via which players trade. The legal issues involved in such a use include the question of whether an entry constitutes an offer or an acceptance as well as questions of proof.[30] The head-on collision between legal categories and rules and technological innovation can, according to Mr. Parisi, only be solved by legislative intervention.[31] The traditional legal constructs of offer and acceptance cannot be applied to the fast-paced matching of offers in the computerized marketplace.

The offers transmitted by the computer are offers to the public.[32] These offers are sufficiently definite as to price and quantity to become binding upon acceptance. To avoid the issue of crossed offers,[33] the author suggests that an offer entered later in time which matches a previous offer be considered an acceptance.[34]

There remains one hurdle. An acceptance creates a binding contract only when the acceptance is known or should be known to the offeror.[35] While a computer *qua* marketplace can keep precise track of the entry time of offers and align the offers to the public into offers and acceptances based on time of entry, it cannot track the moment at which the acceptance effectively becomes known to the offeror.[36] Knowledge of an acceptance is difficult to verify. The law might create a presumption that anyone entering the market keeps track of which of her offers have been accepted and which have been converted to acceptances of another's offer.[37] But this kind of presumption would be difficult to create in a civil law system, without a specific legislative intervention.

However, with the computerized marketplace, situations occur which cannot adequately be addressed by legal constructs and presumptions. In the computerized stockmarket, offer and acceptance can be nearly simultaneous without the parties being face to face, making the presumption that the offeror knows of the acceptance a somewhat unrealistic exercise in legal reasoning.

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30. *Id.* at 27.
31. *Id.* at 30-31.
32. *Id.* at 27.
33. *Id.* at 29; *see also id.* at 35-36.
34. *Id.* at 29-30.
35. *Id.* at 29. The author speaks of the moment at which the acceptance is considered to have entered the "legal sphere of the offeror." *Id.* at 30. Under Article 1326 of the Italian Civil Code, the legal effects attached to a binding contract can only come into play once the contract has been formed through the offeror's knowledge of an acceptance. *Id.* at 30-31.
36. *Id.* at 29.
37. *Id.; see also supra* note 35.

Finally, the use of a computer as a marketplace or stockmarket raises the same type of evidentiary issues described above with the only difference that in the case of computer as a marketplace, the system is usually run by a third party, different from the offeror and the offeree, and presumably neutral to the parties' interests, and calls for similar solutions, namely the use of non-erasable storage for the electronic document and/or the use of seals to prevent the alterations of such documents.[38] The user will additionally have to restrict access to terminals plugged into the computerized market because, under basic agency rules, she might be held responsible for any offers or acceptances emanating from her computers.

CONCLUSION

Much of Mr. Parisi's analysis and discussion is highly relevant for any lawyer thinking about the use of computers in contract formation. The legal principles with which the author grapples are the same basic contract principles which American lawyers encounter in practice. As the author attempts to reconcile the electronic contract making process and the legal issues of offer, acceptance, formation of a binding contract, and legal proof, the American reader will find innovative as well as traditional insights into familiar issues.

CASE UPDATE

The *Case Update* is a survey of recent state and federal court decisions which relate to high technology. Cases are included either because they introduce new substantive law in areas which are important to a technology law practice, or because they illustrate a new application of other areas of law to technology. The cases are organized below under appropriate headings. As many of the cases we report are quite complex or ongoing, the decisions reported herein are not necessarily final dispositions.

Table of Contents

ANTITRUST/UNFAIR COMPETITION

Competitors May Share Patent Rights Without Violating Antitrust Laws

Polysius Corp. v. Fuller Co., 709 F. Supp. 560 (E.D. Pa. 1989).

Dr. Klaus Schonert held a U.S. patent for a method of reducing the size of brittle minerals. Polysius Corporation, a German corporation, held a license granted by Schonert for this patent. In 1979, Schonert attempted to obtain a German patent, but was opposed by the German firm of Klockner-Humboldt-Deutz ("Klockner"). Six years later, in 1985, Schonert, Polysius, and Klockner settled their differences. Klockner withdrew its opposition, and in exchange, Schonert agreed to obtain permission from Polysius and Klockner before issuing further licenses. Polysius and Klockner agreed to share expenses related to enforcing the patent. Shortly thereafter, Polysius refused to allow Schonert to grant a license to Fuller Co. Fuller subsequently developed its own equipment to carry out the Schonert process. Polysius and Schonert brought this patent infringement action against Fuller, who counterclaimed against Schonert, Polysius, and Klockner for antitrust violations and unfair competition.

After finding that Fuller had infringed the patent, the court dismissed Fuller's antitrust claims. The court first found that Polysius' control of the sale of the equipment used for the Schonert process did not make it guilty of antitrust violations or patent misuse: the equipment is not a staple article of commerce because its cost is prohibitive if not used for the patented process. The court also found that Fuller did not present any evidence that Polysius and Klockner had agreed to fix prices, allocate markets or engage in predatory pricing, and the fact that Klockner and Polysius had contracted to share the rights and expenses related to the patent was insufficient to trigger a *per se* violation of the Sherman Act.

District Court Enunciates Factors Required to Recover Damages for Unfair Use of an Invalid Patent to Preserve a Monopoly Position

Conceptual Eng'g v. Aelectronic Bonding, Inc., 714 F. Supp. 1262 (D.R.I. 1989).

Conceptual Engineering ("CE") held a patent for welding jewelry. This patent was found invalid by a lower court as CE had failed to name Joe Mallett, a defendant, as co-inventor. Defendants now seek damages

for lost sales and harm to their reputations, claiming that CE used this invalid patent to preserve a monopoly position.

The criteria used to determine if a Sherman Act violation has occurred in such a situation are: (1) clear and convincing evidence of bad faith prosecution of a patent suit; (2) specific intent to monopolize; (3) dangerous probability of successful monopolization; and (4) damages clearly attributable to the patentee's actions.

The court held for defendants. The court indicated that there are two ways to show bad-faith prosecution of a patent suit: obtaining a patent through willful misrepresentation to the Patent Office, and maintaining or enforcing a patent with knowledge of its invalidity. In this case, CE was necessarily aware of the co-inventors of the patented process and willfully misrepresented this fact to the Patent Office.

The court then found that the facts of the case clearly indicated CE's intent to monopolize. CE not only excluded its co-inventor from the patent, but also tried to drive defendants out of business by publishing advertisements that falsely accused them of patent infringement. In fact, CE threatened defendants' potential customers with lawsuits.

Finally, the court found that CE was likely to have been successful in monopolizing the market. The court thus held that the harm to defendants was attributable to CE's actions and awarded damages accordingly.

CIVIL PROCEDURE

Standing To Sue May Be Assigned Along With Other Rights Relating to Computer Programs

Barrett Computer Services v. PDA, Inc., 884 F.2d 214 (5th Cir. 1989).

In the spring of 1983, PDA, Inc. contracted to design software for American Excel Corp., a corporation owned and controlled by Gene Barrett. In October 1983, Barrett created Barrett Computer Services, Inc. ("BCS"), and requested that PDA resubmit all programming bills and past invoices to BCS. In August 1984, Barrett sold his interest in American Excel Corp. At the closing, he repurchased the computer programs written by PDA. The rights to these programs were later transferred to BCS.

BCS sued PDA on several counts relating to the original software design contract. PDA filed a summary judgment motion claiming that BCS lacked standing to sue due to lack of privity with PDA. Barrett claimed that when he purchased the PDA computer programs and conveyed them to BCS, he also purchased and conveyed all rights relating

to them, including all causes of action. The district court did not agree and granted PDA's motion for summary judgment.

The Fifth Circuit Court of Appeals however, giving BCS the benefit of all reasonable factual inferences, held that the issue of BCS' standing was a triable issue of fact under the circumstances. The appellate court thus remanded the case for an evidentiary hearing on that issue.

"National Contacts" Test Used to Find Jurisdiction Over Japanese Company in Antitrust Suit Involving Dual-deck VCR

Go-Video, Inc. v. Akai Elec, Co., 885 F.2d 1406 (9th Cir. 1989).

Go-Video, a Delaware corporation with its principal place of business in Arizona, holds the U.S. patent for the "VCR-2," a dual-deck video cassette recorder. Go-Video filed suit against various foreign electronics manufacturers, alleging their participation in an agreement to prevent the marketing of dual-deck video cassette recorders. The foreign defendants were served under the long-arm provision of Section 12 of the Clayton Act, 15 U.S.C. § 22. The foreign defendants moved to dismiss for lack of personal jurisdiction.

The Court of Appeals for the Ninth Circuit held that the special venue provisions of the Clayton Act did not preempt the more liberal provisions of the Alien Venue Act, 28 U.S.C. § 1391(d), and that venue properly lay in Arizona.

The court of appeals also affirmed the district court's application of the "national contacts test" in establishing personal jurisdiction over the defendants. This test "authorizes the exercise of personal jurisdiction over an alien corporation . . . so long as the corporation had sufficient minimum contacts with the United States at large." 885 F.2d at 1413. The court of appeals went on to state that "[i]f there is something peculiarly oppressive about litigating in Arizona, appellants are free to avail themselves of the venue transfer statute. . . . " 885 F.2d at 1417.

Ninth Circuit Refuses To Uphold Rule 11 Sanctions Against Attorney Who Filed Complaint After Incorrect Factual Conclusion that Computer Hardware Was Defective

Jensen Electric Co. v. Moore, Caldwell, Rowland & Dodd, Inc., 873 F.2d 1327 (9th Cir. 1989).

In May 1989 the United States Court of Appeals for the Ninth Circuit reversed a district court order imposing Rule 11 sanctions against a third party complainant's attorney. The court of appeals found that the attorney had made a reasonable inquiry into the facts before filing the third-party complaint.

The original action was between Jensen Electric Co. and Dynacom Systems, Inc. for breach of contract. The breach stemmed from a contract to design and build a computer-based facilities management alarm system for Jensen's new hotel. Gregory Osborn, an electrical engineer, was hired by Dynacom as an independent contractor to design and implement the computer's hardware programs. Dynacom was subsequently purchased by Qualcorp, Inc., who took over the Jensen contract but never completed the project. Jensen ordered Qualcorp to cease work and brought suit for breach of contract.

Qualcorp counterclaimed for unreimbursed expenses and simultaneously filed a third party complaint against Osborne, who had terminated his work with Qualcorp and accepted employment with Jensen. Qualcorp alleged that Osborne was responsible for the computer hardware programs. All but Rule 11 issues were submitted to an arbitrator who denied recovery to all parties.

Osborne sought to recover costs and attorney's fees from Harry L. Styron, Qualcorp's counsel. The district court imposed Rule 11 sanctions on Styron. Per Styron's appeal, the court of appeals considered whether Qualcorp's third party complaint was frivolous. Osborne alleged that Qualcorp and Styron did not have any reason to suspect Osborne's work because at the time Jensen terminated the contract, the hardware programs had been performing satisfactorily. Further, because Qualcorp had not yet been found liable, Qualcorp should not have filed a third-party complaint premised on indemnity.

Styron responded 1) that Osborne had failed to perform field testing of the hardware with such variables as temperature, humidity, and electric currents and 2) that other potential indemnitors were not impleaded because Osborne's hardware appeared to be the basis for Jensen's complaint. Styron said he filed the third-party complaint only after meeting with his clients for eleven hours, reviewing Osborne's blueprints, and concluding that if something was wrong with the system, it was due to Osborne's hardware.

The appellate court concluded that Styron's complaint presented an arguable claim for Osborne's liability to Qualcorp and was thus not frivolous. The court noted that even if Styron was incorrect about Osborne's liability, it was reluctant to impose sanctions for factual errors, especially errors filed after a reasonable inquiry and before an opportunity for discovery.

Federal Circuit Court Is a Co-Equal Member of 13 Circuits and Cannot Review Decisions of Other Circuit Courts

In re Roberts, 846 F.2d 1360 (Fed. Cir. 1988).

Roberts received a patent entitled "quick release for socket wrenches" on September 28, 1965. The patent was assigned to Roberts' employer, Sears, Roebuck & Company. In 1969, Roberts filed the first of four suits against Sears alleging fraud, breach of confidential relationship, and negligent misrepresentation. After several appeals, Roberts was awarded all patent rights from January 20, 1977 until the expiration of the patent in 1982. Three suits followed (Robert II through IV) resulting in a new trial granted by the Seventh Circuit sitting en banc. After the district court determined that no additional grounds warranted a new trial, Roberts filed a petition for writ of mandamus.

The Court of Appeals for the Federal Circuit dismissed the petition for lack of jurisdiction, stating that it is a "co-equal member" of the thirteen appellate courts and therefore could not review and reverse the judgment of an appellate court. Further, there is no independent basis for jurisdiction over writs of mandamus, since the mandamus statute, 28 U.S.C. § 1651, is not a grant of jurisdiction.

California District Applies Per Se Jurisdiction Test For Foreign Corporations That Sell Goods Through State Based Subsidiary

Meyers v. ASICS Corp., 711 F. Supp. 1001 (C.D. Cal. 1989).

ASICS Corp., a Japanese manufacturer of sports shoes distributes shoes in the United States through its wholly-owned subsidiary, Tiger Corp., a California corporation. ASICS also maintains a "liaison" office in California which monitors the United States shoe market. Meyers, a holder of a patent for a special sole and insole, filed a patent infringement suit against ASICS in the Central District of California.

The district court upheld personal jurisdiction over ASICS under the standard set in *United States v. Toyota Motor Corp.*, 561 F. Supp. 354 (C.D. Cal. 1983). The court stated "[t]hough mere ownership of a domestic subsidiary may not automatically confer jurisdiction over the parent, . . . there is no obstacle to jurisdiction over a parent if it uses its subsidiary as a marketing conduit." 711 F. Supp. at 1004 (quoting *Toyota Motor* 561 F. Supp. at 359). This holding seems to indicate a per se jurisdiction test.

German Plaintiff Must Abide by Federal Rules and Produce Former Employees Residing in Germany to Testify in Patent Case

In re Nifedipine Capsule Patent Litig., 13 U.S.P.Q.2d 1574 (S.D.N.Y. 1989).

In connection with a patent infringement action, Siegfried AG and Siegfried Pharmaceuticals requested that plaintiff Bayer AG, a German corporation, make four inventors named on the patent available for deposition. The four inventors reside in Germany and no longer work for Bayer. Bayer claimed that it could not compel the inventors to be deposed and suggested that Siegfried request Letters Rogatory pursuant to German law and the Hague Convention.

As Siegfried demonstrated its need to depose the inventors, the district court required that Bayer make the inventors available for deposition. The court noted that the inventors had entered into a written assignment with Bayer in which they agreed to testify in any legal proceedings whenever requested. This assignment did not invoke German law or set an expiration date for the inventors' obligation to testify.

Further, the court found that Bayer's reluctance to produce the inventors was not "reasonable cooperation." As a United States plaintiff in a United States court asserting a United States patent, Bayer must, in the interests of justice, proceed according to the Federal Rules of Civil Procedure.

CONSTITUTIONAL LAW

Federal Patent Laws Preempt Florida Statute Protecting Unpatented Vessel Hulls

Bonito Boats, Inc. v. Thunder Craft Boats, Inc., 109 S. Ct. 971 (1989).

In 1983, after plaintiff, Bonito Boats, Inc., had made its unpatented boat hull design available to the public for six years, the Florida legislature enacted Fla. Stat. § 559.94, which made it "unlawful . . . to use the direct molding process to duplicate for the purpose of sale any manufactured vessel hull . . . made by another without the written permission of that other person." 109 S. Ct. at 974 (quoting Fla. Stat. § 559.94(2)). Plaintiff brought suit under the statute to enjoin duplication of its hull by Thunder Craft Boats, Inc. (Thunder Craft), of Tennessee.

The Florida Supreme Court upheld the trial court's dismissal of the case. The court ruled that the Florida statute conflicted with federal patent law and was therefore invalid under the Supremacy Clause of the Constitution. Dissenting judges argued that an anti-direct molding

statute prohibited only one method of copying the unpatented hull and not the copying of an unpatented item. The Supreme Court granted certiorari to resolve the conflict.

The Supreme Court affirmed the Florida Supreme Court's ruling, relying largely on *Sears, Roebuck & Co. v. Stiffel Co.*, 376 U.S. 225 (1964), and on *Compco Corp. v. Day-Brite Lighting, Inc.*, 376 U.S. 234 (1964). In the aforementioned cases the Court found that an unpatented, publicly-known design occupied essentially the same position as the subject matter of an expired patent. Impeding the copying of such articles freely available to the public impermissibly "interfere[s] with the federal policy . . . of allowing free access to copy whatever the federal patent and copyright laws leave in the public domain." 109 S. Ct. at 979 (quoting *Compco*, 376 U.S. at 237). Although the Florida statute prevented only a single method of production of a boat hull, it was "evidently the most efficient manner available," and thus it unfairly restricted competition. *Id.* at 981.

The Court discussed at length numerous policy considerations embodied in the federal system of patent laws, noting that "the ultimate goal of the patent system is to bring new designs and technologies into the public domain through disclosure. . . . To a limited extent the federal patent laws must determine not only what is protected, but also what is free for all to use." *Id.* at 978. The court also discussed the danger of undermining the patent system if the fifty states were allowed to legislate on most aspects of technology protection.

At the same time, the Court reaffirmed two areas in which states could permissibly regulate "patentable subject matter" without violating the Supremacy Clause. First, "states may place limited regulations on the circumstances in which . . . [trade dress] designs are used in order to prevent consumer confusion as to source." Such protection is limited to "nonfunctional aspects of consumer products which have acquired secondary meaning such that they operate as a designation of source." *Id.* at 1001. Secondly, "state protection of trade secrets did not operate to frustrate the achievement of the congressional objectives served by the patent laws." *Id.* at 996. But, of course, such regulation does not forbid the public from discovering and exploiting the trade secret "through reverse engineering of products in the public domain or by independent creation." *Id.* at 997.

States Have 11th Amendment Immunity From Suits Brought Under the Federal Copyright Act

Richard Anderson Photography v. Brown, 852 F.2d 114 (4th Cir. 1988), *cert. denied,* 109 S. Ct. 1171 (1989).

Radford University, a state school, contracted with a graphic design firm to produce a student prospectus. The firm hired defendant photographer to provide photographs for use in the prospectus. Defendant argued that the university later used copyrighted photographs from its prospectus without his consent and sued for injunctive and monetary relief. The district court dismissed the suit ruling that the Copyright Act did not abrogate the state's eleventh amendment immunity.

The Court of Appeals for the Fourth Circuit found that Congress did not intend the Copyright Act to abrogate states' immunity with respect to copyright issues. The court noted that Congress may abrogate state immunity "only by making its intention unmistakably clear in the language of the statute." 852 F.2d at 117. Applying this test to the language of the Copyright Act revealed that Congress never unequivocally expressed its intention in the Act to usurp sovereign immunity.

In reaching this conclusion, the court rejected the plaintiff's argument that Congressional intent to abrogate immunity was illustrated by exceptions found in different sections of the statute. Specifically the court found that replacement of "any person" with "anyone" in the 1976 revision of Section 501 was not specific enough to indicate an intent to abrogate state immunity. Further, explicit exemptions for government bodies found in Sections 110(2), 110(6), 110(8), 111(a), 112, and 118(d)(3) were dismissed by the court as too ambiguously worded to imply that states were not generally immune to the Act's protection. The court noted that the phrase government body could refer to local governments or government officials as well as states. The court also ruled that the state did not waive its immunity by participating in federally regulated conduct through its own copyright activities.

Finally, the court reversed the dismissal of the claim against the state official in her individual capacity because state law does not provide such immunity.

Cordless Telephone Communication is not Protected by the Wiretap Act or the Fourth Amendment

Tyler v. Berodt, 877 F.2d 705 (8th Cir. 1989), *cert. denied,* 110 S. Ct. 723 (1990).

At the urging of local law enforcement officials, the Berodts had used their own cordless telephone to monitor and record the cordless telephone conversations of their neighbor, Scott Tyler. In Tyler's

criminal trial, the state court had excluded the recordings as having been obtained in violation of the Wiretap Act. Tyler then brought this civil action against the Berodts and the law enforcement officials for the "willful interception" of his "wire" and "oral" communications in violation of the Wiretap Act and the fourth amendment.

The district court held, and the Eighth Circuit affirmed, that the cordless telephone transmissions were not "wire communications" protected by the Wiretap Act, but instead were merely "oral communications," protectable only if there was a justifiable expectation of privacy as defined by the Supreme Court. The court of appeals found, after reviewing other circuit courts' treatment of this issue, that speakers who were aware that their conversation was being transmitted by cordless telephone had no justifiable expectation of privacy. The Supreme Court denied certiorari.

Federal Patent Law Does Not Preempt State Law Compelling Equitable Relief From Contractual Termination Clauses

Power Lift, Inc., v. Weatherford Nipple-Up Sys., 871 F.2d 1082 (Fed. Cir. 1989).

In March 1986, Power Lift granted Weatherford a non-exclusive license in a Settlement Agreement providing for monthly royalties. Power Lift could terminate the license if royalties were not paid. Weatherford paid the royalties on a quarterly basis, according to the terms of a draft agreement.

In July 1987, Power Lift terminated Weatherford's license for failure to pay the royalties. Weatherford tendered the deficient royalty payments, plus interest, and continued practice of Power Lift's invention in violation of an injunction. In December 1987, Power Lift applied for an order of civil contempt.

The District Court found that the Settlement Agreement was governed by Oklahoma law. In Oklahoma, contract termination clauses are enforceable, but compelling equitable circumstances may justify relief from forfeiture. The court found that equitable circumstances prevailed here and relieved defendant from forfeiture.

Power Lift appealed, claiming that federal patent law conflicts with, and thus preempts, the Oklahoma law. The court of appeals disagreed, finding under *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257 (1979), that federal law does not preempt state contract law so as to preclude enforcement of the contract. The appellate court thus held that the federal patent laws do not preclude re-reinstatement of a license contract when equitable circumstances so dictate.

CONTRACTS

Sophistication of Computer Buyer with Respect to Both Computers and Contracts Important for Determining Enforcability of Contractual Disclaimers

Sierra Diesel Injection Service, Inc. v. Burroughs Corp., 874 F.2d 653 (9th Cir. 1989).

This case involved a suit brought by Sierra Diesel Injection Service, Inc. against Burroughs Corporation, a computer company, on grounds that Burroughs misrepresented the capabilities of its computers. Sierra initially wanted to purchase a posting machine from Burroughs. Burroughs salespeople suggested, both orally and in writing, that Sierra instead buy the Burroughs model B-80 computer because of its supposed inventory and accounting capabilities. Sierra bought the B-80 and signed various purchase and maintenance contracts. The computer did not perform the promised functions and suffered several breakdowns. Burroughs attempted to repair the system but ultimately advised Sierra to buy a Burroughs model B-91 computer, which Sierra did. The second computer also failed to perform the promised functions. An independent computer consultant advised Sierra that Burroughs equipment was incapable of performing the desired functions.

The trial court entered a judgment for Sierra, finding that the contract was not fully integrated and that the warranty exclusion clause was not sufficiently conspicuous. The court of appeals affirmed.

The appellate court found the relative sophistication of the parties, with respect to both computers and contracts, as an important factor in determining integration. Sierra's owner had little knowledge of computers or contractual concepts such as "marketability." As such, he had reasonably understood Borroughs' written claims concerning the computer's capabilities to be part of the contract. Burroughs on the other hand, was aware of Sierra's needs and purpose in buying computer equipment, and further, had unilaterally drafted the long contract with little input from Sierra. Thus, the court did not find the presence of a merger clause to be conclusive evidence of the parties' intent to integrate.

The court also found that, in light of Sierra's unsophistication, Borroughs had failed to sufficiently draw attention to the warranty exclusion clauses in the contract. The disclaimers were not printed in large type, and had been inconspicuously placed within the body of the contract.

Limited Patent Waiver and Non-Disclosure Agreements Do Not Require Consideration Beyond At-Will Employment

MAI Basic Four, Inc. v. Basis, Inc., 880 F.2d 286 (10th Cir. 1989).

MAI Basic Four, Inc., a computer software company, required several of its at-will employees to sign two agreements: (1) a Patent Waiver Agreement, which required them to assign any developments or inventions made or conceived during their employment, or within ninety days thereafter, to MAI, and (2) a Confidentiality and Non-Disclosure Agreement, which required them to treat as confidential, all information disclosed to them as a result of their employment with MAI.

While working for MAI, certain employees participated in developing a software product known as "BB/M." In November 1984, MAI closed down part of its operation and terminated these employees. In January 1985, these employees started their own software company, Basis, Inc.

Later that year, Basis began marketing two software products, "BBx" and "Comm 72." MAI alleged that these products were markedly similar to "BB/M," and were developed either during, or within ninety days following, the employees' employment with MAI. MAI subsequently brought an action in district court for breach of the Patent Waiver and Confidentiality Agreements. The district court found these agreements to be restrictive covenants, analogous to "agreements not to compete." Thus, some consideration beyond continued at-will employment was required. The court found no consideration and granted summary judgment in favor of Basis.

The Court of Appeals for the Tenth Circuit reversed, holding that the two agreements required no additional consideration beyond continued at-will employment. The appellate court found that the agreements were clearly *not* covenants not to compete—defendants were "free to work for whomever they wish, wherever they wish, and at whatever they wished, subject only to the prohibition against misusing plaintiff's proprietary information, and [to the limited patent assignment provision]." 880 F.2d at 288. The court found that such agreements "are necessary to insure the commercial viability of companies competing in the development of technology, and both are properly characterized as necessary incidents to a contract for employment in that field." *Id.* The case was remanded to the trial court for a determination of whether defendants had breached the agreements.

In Light of Prior Dealings With Same Form Contract, Party Is Bound By All Contract Terms Although Second Page Not Faxed

American Multimedia, Inc. v. Dalton Packaging, Inc., 143 Misc. 2d. 295, 540 N.Y.S.2d 410 (Sup. Ct. 1989).

In a dispute over an arbitration clause, American Multimedia, Inc. ("AMI") sought a stay of arbitration, alleging that it received only the first page of an order form sent, via fax machine, from Dalton Packaging, Inc. ("Dalton"). The reverse-side second page, containing a provision for arbitration, was not faxed. The New York County Supreme Court denied a petition for stay of arbitration in April, 1989.

The first page of the order form clearly referred to "terms and conditions as set forth on the reverse side." This same order form was used by Dalton in over 100 orders placed with, and filled by AMI during the previous three years. Pursuant to the fax order, AMI delivered goods which Dalton found to be defective. Dalton sent a demand for arbitration to AMI, who petitioned the court for a stay after the 20-day period allowed for filing for stays of arbitration in New York. AMI alleged that it never agreed to arbitration, per acceptance of the second page clause, and therefore could not be required to submit to arbitration after failing to seek a stay within the statutory period.

The court asserted that doubts as to parties' intent should be resolved in favor of arbitration unless there is a clear intent that an arbitration clause does not apply. By filling in the faxed order, the court held that AMI had accepted the terms and conditions to which the first page clearly referred, and about which they knew through their prior dealings with Dalton. The court directed the parties to proceed to arbitration.

COPYRIGHT

Copyright to Works Created by Independent Contractor Vests in That Individual Unless Otherwise Agreed

Community for Creative Non-Violence v. Reid, 109 S. Ct. 2166 (1989).

The Supreme Court upheld a lower court ruling that copyright ownership vested in an independent contractor rather than the agency commissioning the work. Community for Creative Non-Violence ("CCNV"), argued unsuccessfully that Reid was an "employee" of petitioner under the Copyright Act of 1976, 17 U.S.C. § 101 and that as a result, the copyright to a sculpture prepared for CCNV by Reid vested in CCNV according to Section 201(b) of that Act.

The Court construed the term "employee" in Section 101 to have its agency law meaning and enunciated the following twelve criteria by which a court could determine whether a business relationship constituted an employee-employer relationship under Section 101: (1) the skill required in the performance of the task; (2) the source of the instrumentalities and tools; (3) the location of the work; (4) the duration of the relationship between the parties; (5) whether the hiring party has the right to assign additional projects to the hired party; (6) the extent of the hired party's discretion over when and how long to work; (7) the method of payment; (8) the hired party's role in hiring and paying assistants; (9) whether the work is part of the regular business of the hiring party; (10) whether the hiring party is in business; (11) the provision of employee benefits; and (12) the tax treatment of the hired party.

The Supreme Court also affirmed the court of appeals remand of the case to the district court for determination of whether CCNV and Reid prepared the work "with the intention that their contributions be merged into inseparable or independent parts of a unitary whole" such that the parties hold the copyright jointly. 109 S. Ct. at 2180.

Joint Authorship of Prior Work Does Not Automatically Make Joint Authors Co-owners of Subsequent Derivative Works

Weissmann v. Freeman, 868 F.2d 1313 (2d Cir. 1989), *cert. denied*, 110 S. Ct. 219 (1989).

Dr. Heidi Weissmann and Dr. Leonard Freeman worked together for seven years, during which time they researched and co-authored a number of papers on nuclear medicine. In 1985, Dr. Weissmann published an article which named her as its sole author. This article was based on previous papers written jointly by the two parties, and included portions which were taken verbatim from these earlier works. It contained the following new elements: photographic illustrations and captions, references to recent literature, textual additions, and reorganization of previous material. In 1987, Dr. Freeman decided to use this article in connection with a course he was teaching. He replaced Weissmann's name with his own, added three words to the title, and made 50 copies for his class. Dr. Weissmann learned of this and requested that the revised article not be circulated. She then brought this action for copyright infringement.

The court found that the article was not a joint derivative work. Joint authorship of prior existing works does not necessarily make these joint authors co-owners of a subsequent derivative work. In order for a joint work to exist, each author must have intended to contribute to the work at the time his or her alleged contribution is made. Since Dr.

Freeman did not collaborate in any way in the preparation of this derivative article, he retained only his rights in the previous works which were used in this work.

The court also found that the article was protected as a derivative work because the new additions and rearrangement of preexisting works made the article sufficiently original. Finally, the court emphasized that Dr. Freeman's use did not constitute fair use as the copyright laws protect recognition for scientific achievement, the principal reward for publications such as this article.

When Works Are "Strikingly Similar," Copying May Be Found With Minimal Evidence of Access

Gaste v. Kaiserman, 863 F.2d 1061 (2d Cir. 1988).

Gaste, a French composer, wrote the music to a song called "Pour Toi" as part of the score of a film released in France in 1956. He registered the sheet music with the U.S. Copyright Office in 1957. In 1973, Brazilian singer and songwriter, Morris Kaiserman, recorded the song "Feelings," which became an international success. Gaste contended that Kaiserman had access to and copied the obscure "Pour Toi" through Kaiserman's publisher, Fermata International Melodies, which had contact with Gaste and his personal publishing company in the 1950s.

The jury found that Kaiserman had infringed the copyright in "Pour Toi" and awarded damages of $268,000 against Fermata and $233,000 against Kaiserman. The trial court reduced the damages against Kaiserman to $135,140 after deducting the profits attributable to foreign performance.

On appeal, the court rejected Kaiserman's contention that Gaste's song was originally "published" in a movie that lacked the formal copyright notice required by the Copyright Act of 1909 (then in force) rendering the subsequent registration of the song with the U.S. Copyright Office invalid. The court held instead that "Gaste's certificate of copyright registration created a presumption of validity" that was not rebutted at trial. 863 F.2d at 1064.

The court also found the district court properly to have instructed the jury that Kaiserman need only have had a 'reasonable opportunity' to gain access to Gaste's song to satisfy the 'access' prong of the test for copying. The test for proof of the access, however, is even less rigorous in cases of striking similarity. The jury is permitted to infer access from "striking similarity." That inference, however, "must be reasonable in light of all the evidence." *Id.* at 1068.

"First Sale" Doctrine Does Not Extinguish the Right of "Public Performance"

Red Baron-Franklin Park, Inc. v. Taito Corp., 883 F.2d 275 (4th Cir. 1989).

Taito Corp., holder of a copyright for the video game Double Dragon, had granted an exclusive license in that copyright to its subsidiary, Taito America. Red Baron, a video game arcade operator, bought used Double Dragon circuit boards from a third party purchaser in Japan and used the circuit boards to install Double Dragon in its U.S. arcades. Taito brought suit for infringement in U.S District Court. The district court held that under the "first sale" doctrine, the initial sale of the circuit boards in Japan extinguished all of Taito's rights to Double Dragon under the copyright laws, including the right of public performance. *See* 17 U.S.C. §§ 109(a), 106(3), 106(4). As a result, the court found no infringement. Taito appealed.

On appeal, Taito did not challenge Red Baron's right to buy, import, and/or sell Double Dragon circuit boards without its consent. Taito argued only that it had a separate right to "perform" Double Dragon, which it had not granted to Red Baron. The court of appeals agreed and reversed the district court's holding.

The appellate court first found, after considering the definitions of "performance" and "public" in 17 U.S.C. § 101, that a video game's exhibition of sequential images constitutes a "performance" of an audiovisual work. Further, the "performance" of a video game in an arcade was "public."

The court then held that the first sale doctrine limited only the right of distribution, granted to the owner of a copyright by 17 U.S.C. § 106. According to the court, this doctrine does not affect the other four rights of a copyright owner, one of which is the right to perform a copyrighted work publicly. Since Taito had not granted any performance license to Red Baron, the latter had infringed Taito's copyright.

"Structural" Aspects of Computer Software May Be Protectable Expression

Johnson Controls, Inc. v. Phoenix Control Sys., 886 F.2d 1173 (9th Cir. 1989).

Johnson Controls, Inc. had developed a computer program to control wastewater treatment. Phoenix Control Systems, a competing company, was founded by former Johnson employees. Believing that Phoenix infringed its copyright to the wastewater treatment program, Johnson sued in district court. The district court granted Johnson's motion for a preliminary injunction, and this ruling was upheld by the court of appeals.

To establish copyright infringement, Johnson was required to prove the copying of a protected *expression*. Source and object codes are clearly protected by a copyright on the program. Further, the non-literal components of the program, such as the structure, sequence and organization, and the user interface, are protected to the extent that they qualify as an expression of an idea within a specific program. In this case, the lower court could properly find these elements to be protected expression, as they were individualized for specific users and contained the unusual use of point type.

Infringement can be shown by circumstantial evidence of access to the copyrighted work, and by substantial similarity to the work in both ideas and expression. Here, access was demonstrated by showing that some of Phoenix's employees had previously been employed by Johnson. The court also found that a reasonable person in the intended audience could find an unlawful appropriation by Phoenix which captured the "total concept and feel" of Johnson's work. The district court's injunction was thus not clearly erroneous.

Modification of Copyrighted Programs May Exceed Scope of Use-Only License

S.O.S., Inc. v. Payday, Inc., 886 F.2d 1081 (9th Cir. 1989).

This case involved a dispute between S.O.S., Inc. ("SOS"), a corporation which furnishes hardware and software, and Payday, Inc., a corporation which provides financial and payroll services to the entertainment industry. SOS had licensed some software to Payday under a contract which stated that "Payday is acquiring the right to use [the programs, and] S.O.S. retains all rights of ownership." 886 F.2d at 1083. In the course of a subsequent dispute, Payday obtained, without authorization from SOS, an unprotected copy of the software program and had it modified to suit its needs.

SOS then sued for infringement of copyright, and brought pendent state law claims for breach of contract and misappropriation of trade secrets. The district court, applying California law, held that a contract should be interpreted against the drafter. Under this standard, SOS was deemed to have granted Payday any right which it did not expressly retain. Since the contract did not mention the terms "copyright" or "trade secret," the court granted summary judgment against SOS on these claims.

The court of appeals reversed, finding that although the court may apply state law to construe a contract, a license must ultimately be construed in accordance with the purposes underlying federal copyright law. The district court's construction of the contract contravened federal

copyright policy, under which copyright licenses are assumed to prohibit any use which is not specifically authorized. There was thus a triable issue of fact as to whether Payday had infringed SOS' copyright when it copied and prepared a modified version of the programs without SOS' permission.

The court of appeals further held that whether Payday's rights under the agreement included the right to possess an unprotected copy of the software was also a triable issue of fact. The court stated that the district court should have focused on how Payday acquired a copy of the unprotected source code for the program (it was surreptitiously copied by consultants to Payday). If Payday was not authorized to have an unprotected copy of the program, the trade secret claim should be found valid.

Courts Provide Guidelines on Protectability of "Look and Feel"

The following three cases illustrate different courts' approaches to the evolving "look and feel" doctrine.

Data East USA, Inc. v. Epyx, Inc., 862 F.2d 204 (9th Cir. 1988).

Data East USA and Epyx are corporations involved in the development and distribution of audio-visual works for home computers. Data East designed and distributed an arcade and home video game called "Karate Champ." Two years later, Epyx began distributing "World Karate Championship," a competing home video game. Data East sued Epyx for copyright infringement, alleging that Epyx had copied the overall appearance, compilation, and sequence of the audio-visual display of its game.

The district court granted plaintiff's motion for a permanent injunction against Epyx based on its findings that the products were substantially similar. The appellate court reversed and remanded, on grounds that the district court erred in determining the scope of the copyright protection.

The district court's finding of substantial similarity was based on the facts that the combatants in both games made the same motions, wore the same colored outfits, and were supervised by a referee whose rulings were expressed in a similar fashion. Both games also used similar scoring techniques, provided bonus rounds, and displayed the matches against changing geographical backgrounds.

The appellate court held that such similarities were inherent to the sport of karate and to limitations imposed by the computer. Accordingly, they were not protected forms of expression.

Telemarketing Resources v. Symantec Corp., 12 U.S.P.Q.2d 1991 (N.D. Cal. 1989).

This case involves a copyright dispute over two outlining programs developed by John L. Friend: "PC-Outline" and "Grandview." Friend developed PC-Outline first and sold the rights to plaintiff, Brown Bag Software. Subsequently, Friend developed Grandview for Symantec Corp. Plaintiffs alleged that Grandview was substantially similar to PC-Outline and thus constituted an infringing derivative work of the copyrighted program.

The district court found that the majority of the "similarities" pertain to features that are unprotectable "ideas" rather than protectable "expression." These features included: accessing files, editing and printing, pulldown menus, and background colors.

Having made this finding, the court focused on whether the *expression* of these features, through screen displays, was substantially similar. It concluded that there was no copyright violation since the expression between the two screen displays was significantly different, and granted plaintiff's motion for summary judgment.

Manufacturers Technologies v. Cams, Inc., 706 F. Supp. 984 (D. Conn. 1989).

Manufacturers Technologies, Inc. ("MTI") makes and sells a computer software program entitled "Costimator," which enables the user to estimate the cost of machining a manufactured part. MTI sued Cams, Inc. ("Cams") for copyright infringement of its program after Cams began to sell a competing cost estimation program called "Quick Cost." The court granted MTI permanent injunctive relief on the grounds that Cams copied two elements of the screen displays of MTI's "Costimator."

The court began by noting the unsettled state of the law regarding the extent of copyright protection of computer program display elements. The court then elected to follow a recent decision of the Copyright Office, holding that the registration of a computer program protects screen displays as well as the literal elements such as source and object codes. The court held that the single registration should be construed as two separate registrations for copyright purposes, reasoning that the *program* is designed to organize and direct the computer to perform particular tasks, while the *display* is designed to communicate with the user to facilitate use of the program.

In so ruling, the court rejected the defendant's claim that the screen displays are necessarily and solely dictated by the functional considerations of a program. Furthermore, the court noted that if protection were granted to the codes alone, plaintiffs could not seek redress against de-

fendants who did not have access to their codes, but copied screen displays through reverse engineering.

In response to MTI's claims over particular display elements, the court applied the rule that only those elements whose expression is not dictated solely by functional imperatives are worthy of protection. In the instant case, the court found the sequencing and flow of plaintiff's computer screen displays, and its selection and arrangement of terms, to be copyrightable and infringed.

Party Licensed to Use Visual Displays of a Software Program Is Not Limited to the Use of the Displays as a Whole, and May Use Them Separately

Apple Computer v. Microsoft Corp., 717 F. Supp. 1428 (N.D. Cal. 1989).

Apple brought an action against Microsoft and Hewlett-Packard alleging copyright infringement by Microsoft's "Windows 2.03," and Hewlett-Packard's "NewWave." Apple had previously entered into a license agreement allowing Microsoft "to use the visual displays in Windows 1.0 and the named applications programs in current and future software products." 717 F. Supp. at 1429. Microsoft and Hewlett-Packard claim that this license agreement (the "Agreement") is a partial defense to Apple's infringement claim.

Apple claimed that the Agreement only authorized the use of the visual displays of the interface of Windows 1.0 *as a whole.* The district court disagreed, holding that the Agreement, which clearly distinguishes between the interface and the discrete visual displays, authorized use of the visual displays separately. The court thus granted partial summary judgment to Microsoft and Hewlett-Packard insofar as Apple's infringement claim was based on the defendants' use of visual displays that were in Windows 1.0. This ruling applied to all visual displays in Windows 2.03 except the use of overlapping application windows and the use of the icons.

A Synergy of Unprotectable Elements May Be Protectable

Stillman v. Leo Burnett Co., 720 F. Supp. 1353 (N.D. Ill. 1989).

Stillman, an advertising consultant, created and owned the rights to a commercial for Eastern Airlines, which used silence to attract viewer attention. The commercial, which aired in Canada in 1982 and 1983, was quite successful, but was never aired in the United States. Stillman wrote two letters to United Airlines to solicit the company's interest in employing him to produce silent commercials for United's American market. He also sent United the storyboards from the Eastern commercial and suggestions for a silent United commercial.

United did not hire Stillman, but it did air a silent commercial in 1987. Like the Eastern commercials, the first eight screens were in black and white and the last screen was in color. Stillman received a United States copyright for his commercial in 1988. He then sued Leo Burnett, the creator and producer of the United commercial, for copyright infringement, false designation of origin under the Lanham Act, and unfair competition under Illinois state law.

Burnett conceded that Stillman held a valid copyright and that he copied ideas, procedures, and concepts from the Eastern commercial, but he contended that these elements were not protectable under the copyright laws.

The district court denied Burnett's motions for summary judgment and dismissal finding that plaintiff could protect the "creative arrangement and interaction of the techniques composing the expression" of his ideas. 720 F. Supp. at 1360. It held that although the ideas (a first screen announcing that the commercial was silent, use of black and white screens, and the final color screen) used by Stillman in his original commercial were unprotectable, the synergy of such elements was protectable. The court's logic was that Stillman's arrangement of the elements was not dictated by the idea of a silent commercial. If a jury found that both commercials evoked similar responses in ordinary viewers, the court could find that Burnett had copied protectable material.

Enhancements to Computer Programs Do Not Violate Copyright If Not Sold

Foresight Resources Corp. v. Pfortmiller, 719 F. Supp. 1006 (D. Kan. 1989).

Foresight Resources sought a preliminary injunction prohibiting Pfortmiller from altering and distributing versions of "Drafix 1+," a computer program for which Foresight held a copyright. Pfortmiller added five of his own files to Foresight's product to produce the "HK Digitizer" for Hall-Kimbrell, an asbestos removal consulting firm. Hall-Kimbrell was a lawful owner of a copy of Drafix 1+ and had not sold or attempted to sell the HK Digitizer. Approximately ninety percent of the text strings from Drafix 1+ and the HK Digitizer were found to be identical.

Under Section 117 of the Copyright Act, "it is not an infringement for the owner of a computer program to make . . . another copy or adaptation of that computer program provided: (1) that such 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 the possession of the computer program should cease to be rightful." 719 F. Supp. at 1008 (*quoting* Section 117 of the Copyright Act). Adaptations prepared under these provisions are transferable only with the authorization of the copyright owner.

The district court found that Foresight failed to demonstrate a likelihood of success on the merits of its claim that the HK Digitizer violated its copyright or licensing agreement, but did enjoin Pfortmiller from selling the enhancements of Drafix 1+ to any other entities.

Relying on the Commission on New Technological Uses of Copyrighted Works' interpretation of Section 117, the court found that adding new features falls within the right of adaptation, at least when the adaptation is not sold. The court reasoned that this construction serves two important goals of the copyright laws: it allows sophisticated software users the option of enhancing programs without infringing the copyright, and it preserves the market for improvements made by the copyright owner by limiting such user enhancements to in-house use.

Independent Ads Placed on Videos Are Not Trademark or Copyright Infringements

Paramount Pictures Corp. v. Video Broadcasting Sys., 724 F. Supp. 808 (D. Kan. 1989), *aff'd mem.*, No. 89-1412 (D. Kan. Dec. 15, 1989) (LEXIS, Genfed library, Dist file).

Paramount Pictures, a producer of video-movies, placed commercials at the beginning of its videocassettes. Video Broadcasting Systems ("Video"), a distributor of video-movies, placed additional "local" advertisements on the lead-in tape of these videocassettes. Paramount brought suit on several counts, including violation of copyright and trademark laws. Paramount then moved for preliminary injunction, which motion was denied by the district court.

Unauthorized use of a trademark may be an infringement under the Lanham Act if it misleads the public to believe that the user is approved or otherwise connected to the registrant. The district court held that Paramount did not sustain its burden of showing a likelihood of product or sponsorship confusion. The court did not find that the public perceives the videos to be a unit or package containing only Paramount products. Nor did it believe that consumers would likely be misled into believing that plaintiff was the source or sponsor of the defendants' advertisements. Finally, the court was skeptical as to whether viewers actually cared whether Paramount was the source or sponsor of the ads.

With respect to the copyright claim, the court held that the ads did not rise to the level of infringement as they did not amount to

"publish[ing] the protected work after making extensive, unauthorized changes *which impair the integrity of the original work.*" 724 F. Supp. at 820 (emphasis added).

Sending Signals to Local Operators for Retransmission Constitutes "Public Performance"

David v. Showtime/The Movie Channel, 697 F. Supp. 752 (S.D.N.Y. 1988).

The plaintiffs in this copyright infringement action were individual members of the American Society of Composers, Authors, and Publishers ("ASCAP"). Defendant, Showtime/The Movie Channel Inc. ("Showtime"), broadcasts television programming, mainly movies, to thousands of local cable companies who then transmit the programs to individual subscribers. Showtime had been licensed by ASCAP to transmit its copyrighted works for a limited time. After the license expired, Showtime continued to transmit those works. ASCAP consequently brought this action.

Showtime asserted various affirmative defenses, one of which was that Showtime did not "publicly perform" the copyrighted works within the meaning of the Copyright Act. Showtime argued that because its signals went to local operators for retransmission rather than directly to the viewing public, its broadcasts did not constitute a public performance of plaintiffs' works. The court granted plaintiffs' Rule 56(c) motion to dismiss this affirmative defense, holding that Showtime's transmission of plaintiffs' works "constituted 'public performance' within the meaning of the Copyright Act." 697 F. Supp. at 759.

The court concluded after examining the legislative history of the Copyright Act, that Congress intended an expansive reading of the terms "perform" and "publicly." The terms encompassed "each step in the process by which a protected work winds its way to its audience." *Id.* at 759. The court also concluded that Showtime could not claim any exemption from the Copyright Act on the theory that it was merely the passive transmitter of programs it received from another broadcaster, because Showtime selected its own programs and decided when to show them.

CRIMINAL LAW

Repeated Use of Unauthorized Software Copies Does Not Qualify as Racketeering Activity Under RICO

Management Computer Serv. v. Hawkins, Ash, Baptie & Co., 883 F.2d 48 (7th Cir. 1989).

Management Computer Services ("MCS") designs, programs, sells, and licenses computer equipment and software. Hawkins, Ash, Baptie & Co. ("HABCO") is a public accounting firm. Both companies provide accounting services to public housing authorities. MCS was originally a division of HABCO, but was separately incorporated in 1970.

Some time after this separation, MCS contracted to sell a Data General mini-computer and associated software to HABCO. MCS delivered the mini-computer to HABCO, complete with the contract software and HABCO's data. MCS also stored back-up tapes at HABCO containing the contract software as well as other non-contract software. HABCO copied the tapes.

MCS alleged that HABCO used several non-contract programs on the tapes to develop other programs. MCS also alleged that HABCO made unauthorized use of the copies by selling and licensing them to other entities. MCS sued HABCO for fraud, breach of contract, unjust enrichment, and violation of the Racketeer Influenced and Corrupt Organizations Act ("RICO").

The district court granted summary judgment for HABCO on the RICO claim. The court of appeals affirmed. Under RICO, at least two predicate acts of racketeering must occur within a ten-year period to qualify as a pattern of racketeering activity. The court of appeals disagreed with MCS's contention that each time HABCO used the copies of the software, it committed a predicate act. Instead, the court found that there were at most two predicate acts, the unauthorized copying of the contract software and the unauthorized copying of the back-up tapes. Under the facts as pleaded by MCS, HABCO stole the allegedly proprietary software when it copied the tapes. The subsequent uses were not subsequent thefts, although they could be relevant to valuing damages. The court determined that HABCO's activities did not constitute long-term criminal conduct and thus did not form a pattern of racketeering under RICO.

EVIDENCE

Hearing for Consideration of New Trial Granted to Rape Convict After Genetic Matching Test Reveals Possible Miscarriage of Justice

Dumond v. Lockhart, 885 F.2d 419 (8th Cir. 1989), *reh'g denied*, No. 89-15805 (8th Cir. Oct. 11, 1989) (en banc) (LEXIS, Genfed library, US App file).

Wayne Dumond was convicted in 1986 of kidnap and rape after being identified in a police line-up by the victim. He received consecutive sentences of life imprisonment and twenty years.

In 1987, Dumond submitted the victim's clothing containing semen deposits to Dr. Moses Schanfield, an expert in genetic testing, for performance of an immunoglobulin allotype test. Dr. Schanfield concluded that, based on the test, there was a greater than 99% probability that Dumond was not the rapist because the semen did not contain a genetic marker which Dumond possesses. This conclusion was, however, based on the assumption that vaginal fluids were not mixed with the semen sample used for the test, as such mixing would render the results inconclusive.

This evidence cast new importance on questions, only briefly explored at the trial, concerning the number of ejaculations and the location of semen. The court of appeals thus granted a hearing on the claim that Dumond was entitled to a new trial.

FAMILY LAW

Frozen Embryos Found To Be Lives in Being, Not Marital Property

Davis v. Davis, No. E-14496 (Tenn. Cir. Ct. Sept. 21, 1989) (LEXIS, States library, Tenn file).

Mr. and Mrs. Davis had produced several embryos, through in vitro fertilization, for purposes of later implantation in Mrs. Davis' womb such that she could bear a natural child. Upon the Davis' divorce, Mr. and Mrs. Davis disagreed on the fate of the embryos. Mrs. Davis wanted custody of the embryos for later implantation, whereas Mr. Davis wanted to allow the embryos to undergo a "natural death."

The court found that Mrs. Davis was entitled to the custody of frozen embryos produced by her and her husband in accordance with the best interests of the embryos. The court, relying on the testimony of a French developmental biologist, found that life begins at conception,

and that the embryos are therefore alive and not marital property as Mr. Davis had claimed.

INSURANCE

Comprehensive General Liability Insurance Policy Found Not To Cover Loss-of-Use Claim Arising from Mistaken Erasure of Computer Disk Data

Magnetic Data, Inc. v. St. Paul Fire and Marine Ins. Co., 442 N.W.2d 153 (Minn. 1989).

Magnetic Data, Inc. ("MDI") is a computer company engaged in the inspection and repair of computer disk cartridges. Disks suspected of being defective can be inspected visually, by gauge measurements, or electronically. The first two methods do not cause erasure of any information on the disk, while electronic inspection will erase all stored information. A disk is "certified" when all three inspections are made and no defect is found.

Sanger corporation arranged with Control Data Corporation ("CDC") to have 22 of their computer disk cartridges inspected by MDI to determine if any of the disks were defective. Sanger informed CDC that 10 of the cartridges were to be fully "certified" while the other 12, whose information was not backed up by other sources, were to be inspected only by visual inspection and gauge measurement. CDC delivered the 12 disks two days after they had delivered the first 10, and it is uncertain whether the CDC employee, who delivered the 12 disks, instructed MDI employees that these disks were not to be electronically tested. MDI certified all 22 computer disks, thereby erasing all of the stored information.

Sanger sued CDC and MDI for damages incurred as a result of the erasures. MDI invoked its insurance coverage by St. Paul Fire & Marine Insurance Company ("St. Paul") to defend the suit. St. Paul refused to defend, claiming the losses were not covered by the policy. MDI received summary judgment from the district court against St. Paul to defend and indemnify it against this judgment.

The judgment was upheld by the court of appeals, but reversed by the Supreme Court of Minnesota. The policy contained an exclusion clause which stated "[w]e won't cover damage to . . . [p]roperty on your premises . . . for the purpose of being worked on by you." 442 N.W.2d at 155. Since the disks were in fact on MDI's premises for the purpose of being worked on by MDI, the high court held that the exclusion clearly applied. The court thus did not need to make a determination of

whether information contained on computer disks was "tangible property."

INTERNATIONAL TRADE

Goods Held by Customs Service on U.S. Territory Qualify as "Imported Goods" for Purposes of 35 U.S.C. § 271(g)

Bristol-Myers Co. v. Erbamont Inc., 13 U.S.P.Q.2d (BNA) 1517 (D.C. Del. 1989).

In 1988, the Omnibus Trade Competitiveness Act added section 271(g) to Title 35, the patent statute. This created a new infringement cause of action for the importation of products produced using patented processes. The new legislation was to take effect six months after its passage, making its effective date February 23, 1989.

Erbamont held the patent for a process for preparing doxorubicin, a chemotheraputic treatment for cancer. Bristol-Myers began proceedings with the Food and Drug Administration ("FDA") in 1987 for approval to import and distribute doxorubicin from a Japanese manufacturer. Prior to February 23, 1989, Bristol-Myers received shipments of doxorubicin totaling thirteen kilograms. These shipments were held by the U.S. Customs Service in Mayaguez, Puerto Rico pending FDA approval. On May 1, 1989, Bristol-Myers withdrew part of the total shipment, paid the appropriate customs duties, and entered the withdrawn amount into U.S. commerce. Bristol-Myers subsequently sought a declaratory judgment on non-infringement. Erbamont counterclaimed, alleging infringement under 35 U.S.C. § 271(g).

The district court granted Bristol-Myers' motion for summary judgment and dismissed Erbamont's counterclaim. It found that Bristol-Myers had "imported" the doxorubicin before the effective date of the new legislation. The court considered the date of "importation" to be when the shipments were initially received by the Customs Service. The court rejected Erbamont's suggestion that the lawful entry of goods into commerce constitutes "importation." It did, however, leave open the possibility that Bristol-Myers may have violated food and drug regulations, by importing the goods prior to FDA approval.

International Trade Commission Refuses Subject Matter Jurisdiction Under Tariff Act when Plaintiff Has No Process Patent Claim

In re Certain Recombinant Erythropoietin, U.S.I.T.C. Publication, May 1989, at 2186.

In conjunction with a patent infringement suit filed in district court Amgen, Inc. filed a complaint with the International Trade Commission ("ITC") claiming that importation of erythropoietin into the United States by Chugai Corporation was a violation of the Tariff Act of 1930. The Tariff Act states that "importation of an article manufactured abroad through the use of a process which, if practiced in the United States, would infringe a valid and unexpired U.S. patent is an unfair act." 19 U.S.C. § 1337(a)(1)(B)(ii).

Upon initial review, the ITC accepted subject matter jurisdiction and found that Amgen's patent was neither invalid for obviousness nor unenforceable for inequitable conduct. It then found, that since Section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337, only dealt with importation of products whose manufacture would violate *process* claims, the ITC was powerless under the statute to grant relief to Amgen, whose patent contained no process claims.

Although, given no choice by the language of Section 337, the court seemed unsettled by its holding, stating that its holding ignored the underlying *purpose* of Section 337, which is to protect United States industry from unfair practices used by foreign manufacturers who export goods to this country.

The review of the initial determination by the full Commission concurred with the decision, and ordered dismissal. However, instead of accepting jurisdiction and acknowledging its inability to grant relief (as the statute would seem to indicate), the Commission found that it lacked subject matter jurisdiction altogether.

PATENT LAW

Replacement of Worn Parts in Patented Equipment Constitutes Permissible Repair and Does Not Infringe Patentholder's Rights

Everpure, Inc. v. Cuno, Inc., 875 F.2d 300 (Fed. Cir. 1989), *cert. denied,* 110 S. Ct. 154 (1989).

Everpure holds a patent for water filtration equipment which contains a head and an attached filter cartridge. The removable cartridge directs fluids to a filter sealed within the cartridge. Everpure also sells replacement cartridges. Cuno, a competitor, provides a free adapter to

its customers, which allows them to attach a Cuno cartridge to an Everpure head. The Cuno adapter performs the functions of the Everpure neck. Everpure sued Cuno for contributory and induced patent infringement.

The District Court granted Cuno's motion for summary judgment. The court found that the combination of the filter unit and the head is protected, but the filter cartridge is not. Owners of the unit, therefore, are allowed to replace the unpatented cartridge component without infringement.

The Court of Appeals affirmed the summary judgment by invoking the permissible repair doctrine. This doctrine allows the lawful user of a patented combination to make repairs or replace unpatented component parts in order to maintain the combination. Everpure argued that Cuno's adapter is impermissible reconstruction rather than permissible repair because it replaces the unworn neck of Everpure's cartridge and changes the operation of the patented combination by rerouting the water flow through the cartridge.

The court, however, held that Everpure's own decision to seal its filter into its cartridge rendered the filter irreplaceable without the replacement of the entire cartridge. Thus, to replace the worn filter, unworn parts of the filter cartridge also had to be replaced. This replacement, according to the court, constitutes repair, not reconstruction. The court also found that the difference between the water channels in the two cartridges is inconsequential because "the direction of the flow is irrelevant to the nature and function of the patented combination."

Cuno's request for Rule 11 sanctions and attorney's fees was rejected because of the novelty of the case's fact pattern. In a dissenting opinion, Judge Newman contended that the adapter did not come under the permissible repair doctrine simply because it was attached to a worn part that could not easily be replaced.

A Claim Containing Algorithms Is Not Patentable Where the Non-Algorithm Steps Are Only Briefly Mentioned and Merely Provide Data for the Algorithms

In re Grams, 888 F.2d 835 (Fed. Cir. 1989).

This case involved an appeal by applicants Grams and Lezotte ("Grams") from a decision by the Board of Patent Appeals and Interferences.

Grams had invented "a method of testing a complex system to determine whether the system condition is normal or abnormal and, if it is abnormal, to determine the cause of the abnormality." 888 F.2d at

836. The method involved six steps, all but one of which were, in essence, mathematical algorithms.

Mathematical algorithms are not patentable subject matter under 35 U.S.C. § 101. However, the inclusion of an algorithm does not automatically render a claim invalid. Grams argued that the first step in his method, a diagnostic step requiring the performance of chemical laboratory tests, was a "new and useful process" within the meaning of the statute, and thus the claim as a whole was valid.

The court found the claim unpatentable noting that Grams' specification "focuses on the algorithm itself" while only briefly referring to, and not describing, the physical tests. 888 F.2d at 840. This fact, in combination with an observation that the first physical step was simply the means of generating data for the algorithm, rendered the claim unpatentable.

The court declined to hold whether Section 101 precludes patentability *in every case* where the physical step of obtaining data for the algorithm is the only other significant element in an algorithm-containing claim. "Analysis in that area," it wrote, "depends on the claims as a whole and the circumstances of each case." 888 F.2d at 840.

"Means-Plus-Function" Doctrine Allows Patenting of Apparatus Which Utilizes an Algorithm

In re Iwahashi, 888 F.2d 1370 (Fed. Cir. 1989).

The Sharp Corporation developed an auto-correlation unit used in pattern recognition. Unlike the current state-of-the-art auto-correlation units, Sharp's unit employed a new method of calculating auto-correlation coefficients that did not involve multiplication. The new calculation method, while being as fast and reliable as the original, was more cost efficient as it did not require expensive multiplication circuitry.

The patent examiner rejected Sharp's auto-correlation unit patent application on the ground that the subject matter was merely a mathematical algorithm, and therefore was not patentable subject matter. The Board of Patent Appeals and Interferences affirmed.

The Federal Circuit reversed. As many patentable processes involve algorithms, the test is not simply whether the described unit includes an algorithm, but whether issuance of a patent would wholly preempt the use of a mathematical algorithm. The court held that although Sharp's unit operated according to an algorithm, the claim as a whole defined an *apparatus*, which is patentable.

The court noted that the "means-plus-function" doctrine effectively limits the scope of protection to the functional and structural equivalents of the protected unit, and and thus does not protect the algorithm itself.

The court's discussion of the "means-plus-function" doctrine in an application proceeding is significant in itself, since it had previously been considered only in the context infringement.

Patent Which Discloses as Many as 1200 Drug Combinations Will Render a Subsequent Patent for One Such Combination "Obvious"

Merck & Co. v. Biocraft Laboratories, 874 F.2d 804, (Fed. Cir. 1989), *reh'g denied*, No. 89-10106 (Fed. Cir. July 3, 1989) (en banc) (LEXIS, Genfed library, US App file), *cert. denied*, 110 S. Ct. 498 (1989).

Merck sued Biocraft Laboratories for patent infringement of a diuretic combination which contained amiloride and hydrochlorothiazide. The district court enjoined Biocraft from commercially making, using, or selling the formulation, as it had failed to prove that the patent was "invalid or unenforceable."

On appeal, Biocraft claimed that the drug combination was obvious under 35 U.S.C. § 103 and restricted its arguments to a reading of a separate patent which disclosed the aforementioned drug combination as well as over 1200 other combinations.

The court of appeals held Merck's patent invalid for obviousness, finding that no particular formulation is less obvious merely because a patent discloses a multitude of effective combinations. The court also found that medical synergism and "absolute predictability of success" were not criteria for a finding of obviousness—"all that is required [under 35 U.S.C. § 103] is a reasonable expectation of success." 874 F.2d at 818.

Design Patent Filed as a Division of an Earlier Utility Patent May Obtain Benefit of the Earlier Patent's Application Date

Racing Strollers, Inc. v. Tri Indus., 878 F.2d 1418 (Fed. Cir. 1989).

Racing Strollers filed suit against Tri Industries for infringement of a design patent for a baby stroller frame. The application for the design patent was filed on April 14, 1986 as a division of an application filed on October 22, 1984 for a utility patent. Shortly after this suit was filed, Racing Strollers applied to the court for a temporary restraining order. The district court denied the temporary restraining order and certified the following question for interlocutory appeal pursuant to 28 U.S.C. § 1292(b): "Whether an application for a design patent filed as a division of an earlier filed application for a utility patent is entitled to the benefit of the earlier filing date of the utility patent application under 35 U.S.C. § 120 and 35 U.S.C. § 121." 878 F.2d at 1419.

The court held that a design patent application can obtain the benefit of the earlier filing date of a utility patent provided that the applications comply with 35 U.S.C. §§ 120 and 112. Under 35 U.S.C. § 112, the earlier filing must specifically mention the second (design) application. Moreover, in the case of an ornamental design, the first application must contain an illustration of the design.

The court thus overruled *In re Campbell*, 41 C.C.P.A. 896, 212 F.2d 606, 101 U.S.P.Q. 406 (1954) stating that the *Campbell* decision ignored the relevant statutory law contained in 35 U.S.C. §§ 120, 121 & 112.

Federal Circuit Revitalizes Doctrine of Assignor Estoppel, Approving Its Use Where Equities Dictate

Diamond Scientific Co. v. Ambico, Inc., 848 F.2d 1220 (Fed. Cir. 1988), *cert. dismissed*, 109 S. Ct. 28 (1988).

Assignor estoppel may be applied to prevent an assignor, who is sued for infringement, from challenging the validity of the patents previously assigned by him in exchange for valuable consideration. As stated by the Federal Circuit, recent federal court cases "that discuss the doctrine of assignor estoppel reveal some uncertainty about the continued vitality of the doctrine." 848 F.2d at 1223. The court thus accepted this case to set forth some guidelines as to its application.

Dr. Clarence Welter, founder of Ambico, worked for Diamond Scientific Co. ("Diamond") from 1959 until 1974. During that time, he invented a vaccine against gastroenteritis in swine and filed a patent application. While making this application, Dr. Welter assigned all of the rights in the patents to Diamond Laboratories, the predecessor of Diamond, who was subsequently awarded the patents.

Dr. Welter left Diamond in 1974 and formed Ambico, which began manufacturing and selling a gastroenteritis vaccine for swine. Diamond sued for patent infringement. Ambico's answer claimed, among other defenses, three grounds of patent invalidity. The district court granted a motion to strike these defenses on grounds of assignor estoppel.

The Court of Appeals for the Federal Circuit agreed. While acknowledging the general public policy disfavoring the repression of competition by enforcing worthless patents, the court held that this case presented a circumstance in which the equities between the parties should deprive the inventor-assignor of the right to challenge patent rights which he had transferred for valuable consideration. The court found the doctrine especially justified as Dr. Welter had signed an Oath, Power of Attorney, and Petition, attesting to his belief in the validity of the patents.

The court noted the difference between assignors and licensees in that "[u]nlike the licensee, who . . . might be forced to continue to pay for a potentially invalid patent, the assignor who would challenge the patent has already been fully paid for the patent rights." 848 F.2d at 1224.

The court also stated that it was not important that the patents were not yet granted at the time of the assignment — Dr. Welter had assigned the rights to his invention, irrespective of the particular language in claims describing the inventions when the patents were ultimately granted. However, the court did indicate that if Diamond had broadened the claims in the patent applications after the assignments, beyond what could be claimed in light of the prior art, appellants may, under the Supreme Court's holding in *Westinghouse Elec. & Mfg. Co. v. Formica Insulation Co.*, 266 U.S. 342 (1924), be allowed to introduce evidence of prior art to narrow the scope of the claims of the patents in suit.

Specific Intent to Infringe Unnecessary to Show That Officer of Corporation Actively Induced Corporation to Infringe a Patent

Amicus, Inc. v. Alosi, 723 F. Supp. 429 (N.D. Cal. 1989).

Amicus granted a non-exclusive license of its Lang patent to CEC Systems. Alosi, the president and sole shareholder of CEC entered into a licensing agreement for another patent made by Pattridge Post-Tension, Inc., after having been assured by Pattridge's counsel that this patent did not did not infringe the Lang patent under a recent district court ruling.

Amicus filed suit against CEC in the Northern District of California for infringement of the Lang patent. The district court held that the Lang patent had been infringed by CEC's use of the Pattridge process and awarded $143,125 in damages to Amicus. When CEC was unable to pay the $143,125 due to financial difficulties, Amicus sued Alosi as sole shareholder and president of CEC. Amicus claimed that Alosi should be liable for the infringement of the Lang patent under 35 U.S.C. § 271(b), because Alosi actively induced CEC to use the infringing patent. Alosi moved for summary judgment.

The court denied Alosi's motion for summary judgment because he failed to show that he did not actively induce the infringement. The court held, under 35 U.S.C. § 271(b), that it is not necessary to prove specific intent to infringe in order to show that the Alosi actively induced his corporation to infringe the Lang patent.

The court also rejected the argument that Alosi should be absolved from liability because he had obtained legal advice before initiating the

infringing action. The advice from Pattridge's counsel was self-interested, and therefore, not sufficiently reliable to exonerate Alosi from liability.

No Public Comment Opportunity Required for "Interpretive" Patent Office Rule Authorizing Patentability of Multicellular Organisms

Animal Legal Defense Fund v. Quigg, 710 F. Supp. 728 (N.D. Cal. 1989).

The Animal Legal Defense Fund claimed that the Patent and Trademark Office ("PTO") violated the Administrative Procedure Act, 5 U.S.C. § 553 ("APA"), by promulgating a rule without giving notice or the opportunity for public comment, as required by that Act.

The rule stated that the PTO considers "non-naturally occurring, non-human multicellular organisms, including animals, to be patentable subject matter within the scope of 35 U.S.C. § 101 et seq." 710 F. Supp. at 731. Although notice and public comment are generally required before the promulgation of rules, the APA exempts "interpretive" rules from these requirements. The court dismissed the action for failure to state a claim, holding that the rule in question was interpretive under the criteria of the Ninth Circuit.

Unlike other circuits which use a "substantial impact" test to distinguish substantive rules, the Ninth Circuit has defined interpretive rules as those which "merely clarify or explain existing law or regulations." *Id.* (quoting *Powderly v. Schweiker*, 704 F.2d 1092, 1098 (9th Cir. 1983)). In this case, the new rule "merely synthesizes the decisional law that it cites." *Id.* The decisional law consists of two rulings by the Board of Patent Appeals and Interferences (*Ex parte Allen*, 2 U.S.P.Q.2d 1425 (B.P.A.I. 1987) and *Ex parte Hibberd*, 227 U.S.P.Q. 443 (B.P.A.I. 1985)), and a Supreme Court decision, *Diamond v. Chakrabarty*, 447 U.S. 303 (1980). As these rulings had already substantively established the patentability of multi-cellular life-forms, the court found the new PTO rule to be merely interpretive.

Scripps' Multi-Million Dollar Hemophilia Drug Patent Found Invalid on Several Grounds

Scripps Clinic & Research Found. v. Genentech, Inc., 707 F. Supp. 1547 (N.D. Cal. 1989).

Scripps held a patent for the blood-clotting factor VIII:C, produced artificially with recombinant DNA techniques. The technique produces a form of VIII:C which is superior to the naturally isolated factor in the treatment of hemophilia. Somewhat later, Genentech and Chiron Corp-

oration developed and began to produce recombinant factor VIII:C of their own. Scripps brought suit for infringement of its patent.

This case involved a summary judgment motion brought by defendants as to the validity of Scripps' patent. The district court granted this motion, finding the Scripps patent invalid on several grounds. First, it was found to have been anticipated by publication of a Ph.D. dissertation in 1979 which described the isolation of Factor VIII:C of the same potency and purity as that described in the patent. The court also found that factual assertions made without adequate data during the application process constituted inequitable conduct, independently rendering the patent invalid. The patent was found invalid on yet a third ground: that Scripps had failed to disclose the "best mode" of factor isolation by omitting reference to or description of the optimal monoclonal antibody used.

"Product" Patent Protects Against Use and Sale of Product, Regardless of Whether it Is Produced Through Recombinant or Traditional Methods

Amgen, Inc. v. Chugai Pharmaceutical Co., 706 F. Supp. 94 (D. Mass. 1989).

This case involved a dispute over the rights to manufacture and distribute recombinant erythropoietin ("EPO"), a drug used in the treatment of anemia. In June of 1987, Chugai and Genetics Institute (collectively "Chugai") obtained a patent for a nonrecombinant method of purifying EPO. They subsequently built a plant to manufacture and purify recombinant EPO and began exporting EPO to the United States. On October 27, 1987, two months after Chugai had received its patent, Amgen obtained a patent for the preliminary step of manufacturing unpurified recombinant EPO. Amgen immediately filed suit and Chugai counterclaimed.

Granting partial summary judgment, the court found Chugai's patent to be valid and infringed. It reasoned that since Chugai's patent was a *product* patent, covering EPO of a defined composition, Amgen's manufacture, sale, and use of the *identical product*, as admitted in Amgen's own publication, was literal infringement. Citing *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 666 F. Supp. 1397 (N.D. Cal. 1987), the court held that "a product claim still protects the use and sale of the product, regardless of whether the product was produced by traditional or recombinant technology." 706 F. Supp. at 103-04.

Chugai claimed that Amgen's patent was invalid for obviousness, unenforceable for inequitable conduct (bad faith filing of a claim with the ITC), and that it lacked process claims. The court refused to grant

summary judgment on the first two claims, finding insufficient evidence in their support. It did, however, grant Chugai's third claim, ruling that the Amgen patent did not contain process claims. Under the court's reasoning, Amgen was estopped from claiming process claims since, during the prosecution of the patent, Amgen had dropped all process claims after they had been questioned by the Examiner.

Left unsettled after the court's partial summary judgment decision, was whether Chugai's manufacture of recombinant EPO infringed Amgen's patent.

District Court May Determine Validity of a Patent Although ITC Has Previously Found Patent To Be Invalid and Federal Circuit Has Affirmed ITC's Ruling

In re Convertible Rowing Exerciser Patent Litigation, 721 F. Supp. 596 (D. Del. 1989).

Plaintiffs filed nine separate patent infringement actions against numerous companies including Weslo, Inc. Welso was an active participant in an earlier International Trade Commission ("ITC") case instituted by plaintiffs. Defendants, in a consolidated action, moved for a summary judgment of the infringement actions, arguing that the determination by the ITC that the patent was invalid should be given preclusive effect in the District Court. The ITC ruling was later affirmed by the Court of Appeals for the Federal Circuit. The defendants made this claim despite the fact that Congress granted the district courts original jurisdiction over patent matters in 28 U.S.C. § 133.

The court held that the Federal Circuit's upholding of the ITC's validity determination does not preclude district courts from reconsidering the validity of that patent. The court stated that the ITC determines patent validity only for the limited purpose of administering Section 337 of the Trade Reform Act of 1974, regarding unfair trade acts. The federal district courts have jurisdiction over the enforceability and infringement of patents *per se*. Other courts have recognized that ITC determinations of patent validity do not affect the federal courts' ability to determine the validity of the same patents. Further, the legislative history of the Trade Reform Act of 1974 expressly limits the ITC's determinations regarding patents vis-a-vis the federal district courts' original jurisdiction over patent disputes.

Overly Complex Jury Instructions Found Insufficient Grounds for New Trial in Patent Case

FMC Corp. v. H & K Machine, Inc., 718 F. Supp. 1403 (E.D. Wis. 1989).

FMC owns U.S. Patent No. 3,709,231 for a pea and bean thresher with a centralized beater. FMC brought suit against H & K, alleging that H & K infringed the patent by producing a similar thresher machine. The trial court found no infringement of FMC's patent. FMC motioned for, among other things, a new trial on grounds of defective jury instructions.

Specifically, FMC alleged that the jury instructions were too long and complex to be understood absent a written copy, and that they were delivered too softly and quickly to be followed. Complexity of jury instructions can often be a problem, but it is an especially relevant issue in patent cases, where both legal and factual issues are generally quite complex and unfamiliar to an average jury.

The court stated that a new trial may not be granted unless "considered in its totality," a trial is found to be fundamentally unfair. The court concluded that the trial as a whole was not unfair. The jury instructions were but one phase of the trial, during the course of which, the jury was exposed to repeated explanations of the facts and the law, including oral and visual presentations. Thus, the court found nothing to suggest that the jury did not understand the instructions. Furthermore, as FMC had submitted 51 of the 59 jury instructions, the court would not now let it claim such instructions were too long or complex.

U.K. Patent Law Provides Little Protection For Recombinant Biotechnology Products

Genentech, Inc. v. The Wellcome Found., 1988 R.P.C. 143 (C.A.).

A three-member panel of judges of the Civil Division of the Court of Appeals, United Kingdom, upheld the lower court's revocation of a British patent held by Genentech, Inc., for human tissue plasminogen activator ("TPA"). TPA is a protein which occurs naturally in human tissue, in very small amounts. It activates the conversion of plasminogen, a precursor found in cells, into plasmin, an enzyme capable of dissolving fibrin, the fibrous substance in blood clots. In quantity, TPA has great utility as a therapeutic agent for heart attacks and other clotting-related disorders.

In the early 1980's, at least five research teams embarked upon efforts to discover the structure of this protein, which was known to be secreted by human "Bowes melanoma" cancer cells. Genentech was the first company both to successfully discover the amino acid sequence of TPA, and to replicate the protein in quantity using recombinant DNA

technology. In 1986, Genentech obtained a patent for TPA in Britain. Other pharmaceutical firms, who had independently devised their own methods of isolating and producing TPA, disputed the validity of Genentech's patent.

The Wellcome Foundation initiated this suit in British civil court, claiming that Genentech held an unfair monopoly to produce TPA, a natural substance which several other pharmaceutical companies had successfully been able to produce in quantity. Genentech responded by claiming that its British patent, issued in 1986, gave it the exclusive right to produce isolated TPA and counterclaimed that the Wellcome Foundation was infringing its patent.

The lower court revoked Genentech's patent, and this holding was affirmed by the British Court of Appeals. The court held that Genentech's isolation and production of TPA did not constitute an "invention" under the 1977 Patent Act which required an "inventive step," as opposed to a "mere discovery."

According to the court, Genentech's work clearly did not represent the invention of a new "product," as TPA and its actions on fibrin were well known. Nor did it represent the invention of a unique and patentable "process," as Genentech isolated the TPA molecule and replicated it in pure form using cloned microorganisms through the application of known recombinant DNA techniques. Such application required no "spark of imagination" unique to any of the players of the Genentech team.

The court of appeals found the tenacity and dedication of Genentech's research team commendable, and conceded that it seemed unfair for their hard work to result only in a few months lead time in product marketing, but nonetheless held that the patent was invalid.

TORT

Illinois Denies Child Cause of Action Against Mother for Negligent Infliction of Pre-natal Injuries

Stallman v. Youngquist, 125 Ill. 2d 267, 531 N.E.2d 355 (1988).

Plaintiff, Stallman, brought an action against her mother for injuries sustained in utero, as a result of an automobile collision between the mother's automobile and another car. The lower court granted summary judgment for defendant but the appellate court overturned this ruling. The case was appealed to the Illinois Supreme Court.

The high court held that while a claim against a third party is appropriate in cases of pre-natal injury, an action against the mother is not. The court found both that the fetus is not an entirely separate entity

from its mother, and that the creation of a legal duty on the part of the mother would impose on her a duty to guarantee the mental and physical health of another never before recognized in law. Based on its finding above, the court did not reach the issue of parental immunity.

TRADE DRESS

Combination of Functional and Nonfunctional Features May Be Found "Nonfunctional" and Worthy of Protection Under Trade Dress Law

Hartford House Ltd. v. Hallmark Cards Inc., 846 F.2d 1268 (10th Cir. 1988), *cert. denied*, 109 S. Ct. 260 (1988).

Plaintiffs, doing business as Blue Mountain Arts, produce two lines of greeting cards which contain non-occasion emotional messages. These cards have a distinct and easily recognizable appearance. Hallmark produced a competing line that closely resembled Blue Mountain's lines. Blue Mountain requested a preliminary injunction of the basis of trade dress infringement. The injunction was granted by the district court, which determined that Blue Mountain's trade dress, consisting of a combination of about ten distinctive features, including lengthy free-verse poetry and watercolor or airbrushed images, was nonfunctional and therefore protected. Defendant appealed this holding.

The court of appeals upheld the injunction, stating that a combination of features may be nonfunctional and thus protectable under section 43(a) of the Lanham Act, even though the combination includes functional elements. The court held that the test for functionality is whether protecting the combination of features would hinder competition. Here, the availability of other appealing designs for non-occasion greeting cards showed that protecting Blue Mountain's trade dress would not hinder competition. The court therefore concluded the injunction should be upheld, but noted that Hallmark is free to utilize the individual features comprising the protected trade dress unless the district court determines that an individual feature is nonfunctional.

TRADE SECRETS

Overall Software Architecture Found Protectable Trade Secret Although Several Component Parts Were Within Public Domain

Integrated Cash Management Serv. v. Digital Transactions, Inc., 13 U.S.P.Q.2d 1397 (S.D.N.Y. 1989).

Plaintiff, Integrated Cash Management Services ("ICM"), designs computer software for banks. Defendants Mitsos, Newlin and Vafa of Digital Transactions, Inc. ("DTI") are former employees of ICM. Vafa and Newlin wrote ICM's "Seunimnt" utility program consisting of a generic database management system, a generic communications program, a generic menu program, and a generic report writing program. After Vafa and Newlin had worked two weeks for DTI, the company created a prototype of ICM's programs. ICM sued its former employees and DTI for misappropriation of proprietary information in breach of a nondisclosure agreement.

ICM contends that it has a "winning combination" of generic components and secret codes. This combination is not ascertainable by the public. Therefore, ICM argued, the combination should be protected as a trade secret. DTI argued that the programs are not a trade secret because several parts of the programs could be found in textbooks or other publications and several commercial packages contain the certain discrete utilities used by ICM.

The court concluded "that the architecture of the ICM system, as embodied in the source code of the several modules and in the manner in which they relate to and interact with one another, was maintained as a trade secret by ICM." 13 U.S.P.Q.2d at 1407. The court further held that the trade secret was misappropriated by defendants when they produced a system using a different code with similar architecture. The court based its conclusion on ICM's attempts to keep the source codes secret. These attempts included locking the doors to the ICM's offices, requiring employees to sign nondisclosure agreements, and ICM's practice of keeping all source codes secret.

The court also balanced the need to preserve the proprietary information with the rights of defendants to utilize their skill, experience and knowledge in a fashion that is not unduly restrictive. The court asserted that the existence of an agreement between the parties is a significant factor in determining whether defendants misappropriated the trade secret. Such an agreement put the defendants on notice of ICM's interest and shifted the burden of showing independent development to the defense.

Although the court was convinced that defendants sincerely tried to refrain from using ICM's source codes, it was also cognizant of the benefit defendants derived from ICM's work on the programs. In recognition of ICM's right to protect its trade secrets, the court enjoined DTI from using any versions of its database manager, menu, communications, and report writer programs created by Vafa or Newlin for a period of six months. The court also enjoined Vafa and Newlin from contributing to the creation of any programs for six months. The court chose six months to reflect the time ICM put creating its systems, the speed with which current hardware is available to programmers, and the need to neutralize the "head start" gained by DTI for the improper use of ICM's trade secrets.

TRADEMARK

Delay of Three Months After Constructive Knowledge of Trademark Infringement Belies Claim of Irreparable Injury Required For Preliminary Injunction

Mathematica Policy Research, Inc. v. Addison-Wesley Publishing Co., Inc., 11 U.S.P.Q.2d 1391 (Fed. Cir. 1989).

Mathematica Policy Research, Inc. ("Mathematica"), a leading policy research organization, had been using the name "Mathematica" for 14 years in connection with their consulting service, and had been using the trademark "Math," since the early 1980s, in connection with computer simulation models. In mid-July of 1988, Mathematica became aware that Addison-Wesley and Wolfram Research Inc. (collectively "Addison") were using the name "Mathematica" on software and manuals and were using "Math" as part of Wolfram's toll-free number.

Mathematica sent a cease and desist letter in October of 1988, however it did not file suit until March 1989. Addison had initially used the marks in connection with UNIX and Macintosh software. Mathematica's claim was that it did not believe it could establish infringement until March, 1989, when it learned, by reading a review, that Wolfram was using "Mathematica" in connection with *DOS-based software*. The court held that the cease and desist letter belied this contention.

The court also held that, in any event, the DOS software had been available since January of 1989, and Mathematica should have been aware of Addison's use in connection with DOS-based software long before reading the review. Its delay of three and one-half months in applying for the injunction dissipated their assertion of irreparable harm and precluded the granting of a preliminary injunction.

Search Firm Has No Proprietary Interest in Database it Helped PTO Create

Thomson & Thomson v. Quigg, 10 U.S.P.Q.2d 1741 (D.D.C. 1989).

In 1983, the Patent and Trademark Office enlisted the help of three private trademark search companies, Thomson & Thomson, Compu-Mark, and Trademark Computer Research Service, in its ongoing effort to create an automated trademark search system. Each of the three companies agreed to automate a different field of trademark information. In exchange, the PTO was to give the companies a list of its trademarks and agreed not to engage in "bulk" dissemination to the public of information from the database for ten years ("bulk" defined as the dissemination of more than 1000 marks to any person in a single day).

In 1986, Congress passed legislation preventing the PTO from continuing its exchange agreements with the companies. In 1987, shortly before the legislation took effect, the PTO entered into termination agreements with the companies, promising to withhold bulk dissemination to the public for three years. Later, the PTO notified the companies that it would begin bulk dissemination after only two years. The trademark search companies brought suit to enjoin the PTO from public dissemination of the data, alleging that their efforts had created a proprietary interest in the databank.

The court held that the companies' claims arose from the terms of the termination agreements, not from any proprietary interests in the database. The court noted that the PTO had relied on its own resources to create the database and that it had promised not to make the privately assembled data fields available to the public. The court also found that certain design codes used to make trademark logos machine-readable, were based on World Intellectual Property Organization design codes rather than on the work of the private firm assigned to the task. The case was dismissed for lack of jurisdiction because the claim sounds in contract and therefore falls under the jurisdiction of the U.S. Claims Court.