



JUL 17 1991



Honorable William J. Hughes
Chairman, Subcommittee on Intellectual
Property and Judicial Administration
Committee on the Judiciary
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

It is with great pleasure that we send you this study in response to a request for the U.S. Copyright Office and the U.S. Patent and Trademark Office to investigate and report on the possibility of overlapping protection for certain subject matter under the copyright law and the patent law.

The study responds to the particular questions that the Subcommittee asked to be addressed. It discusses two issues relating to patent and copyright overlap in detail. One of these issues concerns the extent to which either Office requires a claimant to elect between securing copyright or patent protection for designs. The other issue relates to each Office's practice regarding protection for elements of computer program "user interfaces" -- screen displays and their components.

We conclude that there is minimal overlap between copyrights and utility patents because the statutes make it clear that the areas of protected subject matter are markedly different. We also conclude that with respect to computer programs in general, there is no overlap in subject matter: copyright protects the authorship in a set of statements that bring about a certain result in the operation of a computer, and patents cover novel and nonobvious computer processes. We note, however, that the use of some computer programs may infringe patents drawn to processes performed by computers. A given design may, occasionally, qualify for both copyright and design patent protection where artistic expression is embodied in a useful article. In this situation, based on our respective interpretations of the law, the U.S. Copyright Office requires an election of protection; the U.S. Patent and Trademark Office does not.

Based on the conclusions of the study, we do not recommend any changes to the law at this time.

Sincerely,

Ralph Oman
Associate Librarian and
Register of Copyrights

Harry F. Manbeck, Jr.
Assistant Secretary and Commissioner
of Patents and Trademarks

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PATENT-COPYRIGHT LAWS OVERLAP STUDY

**Prepared for the House Subcommittee on
Intellectual Property and the Administration of Justice**

by

**The United States Patent and Trademark Office
The United States Copyright Office**

May 1991

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EXECUTIVE SUMMARY

Chapter One - Introduction

The introductory chapter briefly summarizes the scope and focus of the study. In January, 1991, the Chairman of the House Subcommittee on Intellectual Property and Judicial Administration, William Hughes of New Jersey, renewed a request originally initiated by the former Chairman Robert W. Kastenmeier of Wisconsin, that the Copyright Office and the Patent and Trademark Office evaluate the effectiveness of current copyright and patent systems in handling overlapping claims for protection in the same work.

This chapter also summarizes the particular questions which the Subcommittee requested to be addressed. 1) Whether either agency has or both agencies have an election of remedies policy, and, if so, what the authority is for such a policy; if there is such a policy, how many claims (by subject matter) are rejected based on a requirement of election? 2) Whether in the particular agency's opinion there is a complete or only partial overlap in claims -- whether, for example, in the case of a computer program that has received a certificate of copyright registration, a patent for the program would be coextensive with the protection afforded by the copyright law? 3) Information on agency practices with respect to so-called computer program "user interfaces" -- screen displays and the components thereof, such as commands and icons.

The study examines the possible overlap between the copyright and patent laws. In particular, the study discusses two issues relating to copyright/patent overlap in detail. One of these issues concerns the extent

to which either the Copyright Office or the Patent and Trademark Office requires a claimant to elect between securing copyright or design patent protection. The other issue relates to the protectability of so-called computer program "user interfaces" -- screen displays and their components.

Chapter Two - Possible Overlap Among The Utility Patent, Design Patent, and Copyright Laws

This chapter gives an overview of the respective laws and notes areas of possible overlap. It sums up protection offered for two types of patents. Utility patents protect four classes of new and useful inventions -- processes, machines, manufactures, and compositions of matter, and any improvements thereof -- and design patents protect ornamental designs of articles of manufacture. To qualify for a utility or a design patent, the invention must be new and nonobvious.

Copyright protects original works of authorship fixed in any tangible medium of expression. Works of authorship fall into eight categories: literary, musical, dramatic, choreographic, pictorial and sculptural, audiovisual, architectural works, and sound recordings. The copyright term of protection, a relatively long one, is not a significant limiting doctrine. This chapter explains the various doctrines that operate significantly to limit protection -- the de minimis principle, the separability test, and the idea/expression dichotomy.

In general, there appear to be few common elements in the subject matter capable of protection under the respective statutes. Copyright protects only an author's expression, and specifically excludes protection

for ideas, procedures, processes, systems, methods of operation, concepts, principles, or discoveries. On the other hand, utility patents are limited to inventions that are processes, machines, manufactures, or compositions, while an author's expression in the form of printed matter is not patentable subject matter.

We conclude that the subject matter overlap in the two statutes appears to be minimal. We believe this conclusion applies to computer related expressions and inventions. Copyright protection is only available for the expression in a computer program, not any underlying process. Patent protection is only available for a process performed on a computer if the process is not merely a mathematical algorithm or scientific principle. Patent protection is not available for computer programs per se. We do not believe that copyright and utility patent protection is coextensive.

It should be noted, however, that steps in a patented process may be performed according to a program executed by a computer. During the life of the patent, use of a program -- protected by copyright or unprotected by copyright -- to practice the patented process or part of the process, may infringe the patent if the use was not authorized by the patent owner. Also, the patent owner may not reproduce for use the copyrighted program of another without authorization before or after the expiration of the patent.

The circumstances appear to be substantially different regarding overlap between the copyright law and the design patent law. It is recognized that in some cases a given design qualifies for protection under both statutes. More specifically, artistic expression which is embodied in a useful article may qualify for copyright protection as a pictorial, graphic,

or sculptural work if it is a work of artistic craftsmanship or contains identifiably separate artistic authorship. These works of authorship may also be subject matter under the design patent law. It should be noted, however, many designs that are patentable subject matter under the design patent law are not copyrightable subject matter.

Most of the items protectible under the design patent law will lack the separable artistic features necessary to secure copyright. Nevertheless, occasionally proprietors who have successfully secured design patent protection on a useful article lacking separable artistic features will attempt to secure the additional protection afforded by copyright.

The categories of articles possibly qualifying under both design patent and copyright cover a wide range. Many are three-dimensional toys and models that are representational in nature. Certain jewelry designs, such as the Spiro Agnew watch in In re Yardley, may qualify under either statute, as can furniture items, such as representational lamp bases, and appliances like the Mickey Mouse telephone. During fiscal year 1990, the U.S. Patent and Trademark Office issued 7,176 design patents. Of these, the Copyright Office estimates that only a few hundred would qualify for copyright protection if proprietors were allowed to secure dual protection.

Chapter Three - Election of Remedies Policy

Although this study is jointly submitted by the Copyright Office and the Patent and Trademark Office, the views of the Copyright Office do not necessarily represent those of the Patent and Trademark Office, nor do the

Patent and Trademark Office views necessarily represent those of the Copyright Office.

For many years, the Copyright Office has required creators to choose, or elect, the form of protection desired in an effort to avoid overlapping protection in designs. This policy, expressed in 37 C.F.R. §202.10(a) and (b), was derived from judicial guidance on copyright law that appeared to favor an election requirement. The Copyright Office reviewed its policy in 1968 and endorsed the continuation in force of the relevant regulation. No election is required for computer programs, since the election of protection policy does not apply to literary works. Nor has the policy been applied to visual components, such as screen displays, of these literary works.

This policy goes back to a 1910 decision, de Jonge v. Breuker & Kessler, where the court ruled that a claimant could elect to secure protection under either patent or copyright but could not secure both. In 1927 the D.C. Court of Appeals, in In re Blood, embraced the election doctrine. The primary basis for the Copyright Office's policy is the 1929 second circuit opinion Korzybski v. Underwood and Underwood.

The Copyright Office restudied the issue in 1968 and reaffirmed its position based on two grounds -- public policy considerations and publication without notice. The public policy ground is based on the theory that it is an undue extension of the patent monopoly to allow, after the patent has expired, a copyright for the same design. If copyright protection were allowed to continue, the public domain would be deprived pro tanto. The second ground was a more practical one. The patent procedure required

publication in the Official Gazette without notice of copyright. Inasmuch as copyright law required notice of copyright on all published copies to maintain copyright protection, this dual requirement foreclosed copyright protection for the patent drawings and placed the work in the public domain.

Before 1974, the U.S. Patent and Trademark Office practice on election was similar to that of the Copyright Office. However, after the Court of Customs and Patent Appeals's In re Yardley decision, the Patent and Trademark Office stopped requiring inventors to elect between patent and copyright. The Copyright Office reassessed its position in light of In re Yardley, which stated that Congress did not intend to require an author/inventor to elect between copyright and patent. The Copyright Office decided to follow Korzybski over Yardley, since the latter case, after all, was limited to an interpretation of the design patent act while Korzybski interpreted the Copyright Act.

One key policy question for the Copyright Office is whether or not Congress intends that the public shall be able to copy designs disclosed through the patent system when the design patent expires, or whether the copyright law can be invoked to inhibit this copying. The Copyright Office seeks guidance from the Congress about the proper interpretation of the Copyright Act regarding election of protection.

Chapter Four - Computer Programs and User Interfaces

In its request for this study, the Subcommittee specifically inquired about computer programs and user interfaces.

The study defines six common types of user interfaces: (1) commands -- prompts (instructions or inquiries) that call for a response from the user; (2) menus -- a list from which the user makes a choice; (3) Q & A -- a query that the user responds by "y" or "n"; (4) form filling -- the user follows certain steps to get information; (5) icons -- pictorial metaphors that enable the user to carry out certain operations; (6) function keys -- a set of keys usually separate from the standard keyboard to enable the user to push a key and carry out a certain function.

The Patent and Trademark Office discussion focuses on whether or not material related to user interfaces constitutes patentable subject matter. This section describes why the display of a user interface is neither utility nor design patent subject matter, and, despite their appearance, why icons may not be subject to design patent. It also explains why computer programs are not patentable -- because such claims consist of mental steps or printed matter -- but why machines and processes (with the exception of mathematical or scientific algorithms) that generate such displays are. Although the Patent and Trademark Office does not sort by user interfaces, it attempts to report the range of patents issued relating to user interfaces.

The next section focuses on Copyright Office practices regarding user interfaces. The Copyright Office reports on registration practices and considers the possible overlap of patent and copyright for works of visual art and various aspects of computer programs and screen displays, both text and images. The Copyright Office also notes the concern in some quarters

that copyright case law may be moving toward idea protection, though ideas are not within the subject matter of copyright.

This section begins by reviewing 1909 Act registration of computer programs in the Copyright Office. It recounts that, the Copyright Office, under its rule of doubt, began registering published computer programs put in human intelligible form in 1964. While the copyright statute in force since 1909 was undergoing general revision, Congress commissioned the National Commission on New Technological Uses (CONTU) to study whether it should give computer programs copyright protection under the new law. The Final Report of CONTU recommended that the copyright statute expressly provide copyright protection for computer programs under the 1976 Act.

The report describes current Copyright Office registration practices regarding computer programs and screen displays in some detail. It discusses the kind of deposit required, the degree of particularity in which a claim must be described, the examination standards regarding copyrightability of computer programs and related works, such as menu screens, and, last, the new unitary registration policy. In the course of the discussion, the report cites the case law on which the practices are based.

The Copyright Office registered 12,604 computer related works over the most recent twelve month period for which the Office has registration totals. The Copyright Office estimates that around one tenth of this number includes screen display claims, with the great majority of these containing textual material, rather than pictorial icons or other visual authorship in addition to literary material. The number of audiovisual screen displays registered over the most recent twelve months is 84, with the great majority

of those claims constituting videogames." Registrations of primarily or entirely visual arts screen displays unaccompanied by a computer program averages ten per year, with a significant increase over the last six months.

The report also discusses how the law protects computer program screen displays. Although the law can be regarded as settled with respect to some aspects of computer programs, other aspects, like "look and feel" and "nonliteral protection," remain unsettled. The section ends with a summary of the Copyright Office review of computer programs and user interfaces.

Although the theory of copyright and patent law makes clear that there is no overlap of subject matter respecting computer programs, some commentators perceive problems because of court interpretation of the copyright law in a way that, they contend, approaches patent protection for inventions. Critics point to infringement awards for copying the "total concept and feel" of a program, and charge that the courts misapply two doctrines -- the idea-expression dichotomy and the "abstractions" test for infringement -- to protect the structure, sequence, and organization of computer programs.

Other commentators feel that the courts are applying traditional principles of law to computer program cases and that no new doctrines are being devised. They urge that there is no confusion between "look and feel," which relates to pictorial authorship, and structure, sequence, and organization, which relates to compilation authorship. Some even urge that computer software deserves stronger protection.

Courts continue to wrestle with the extent of protection appropriate for "nonliteral" copying. The Copyright Office concludes that it is

premature to determine whether the courts have extended overbroad protection to computer programs. Considering the state of flux in the law, Congress may choose to adopt a wait and see attitude before considering amendment to the copyright law regarding protection of computer programs.

Chapter Five - Conclusions

The Copyright Office and Patent and Trademark Office jointly conclude that there appears to be minimal overlap between the subject matter of copyrights and utility patents because the statutes make clear that the areas of protected matter in each case are markedly different. Copyright protects an author's expression; utility patents protect inventions.

With respect to computer programs in general, there is no overlap in subject matter: patents cover novel and nonobvious processes, and copyright covers literary works i.e. sets of statements that bring about a certain result in the operation of a computer. However, using or selling certain computer programs may infringe a patent because these programs execute a patented process.

Occasionally, a given design would qualify for both copyright and design patent protection, where artistic expression is embodied in useful articles. This situation has existed for many years and has not appeared to create any undue problems. For this reason, the Patent and Trademark Office and the Copyright Office do not recommend any change to the patent and copyright laws.

PATENT-COPYRIGHT OVERLAP

I. INTRODUCTION

In August 1990, the House Subcommittee on Courts, Intellectual Property, and the Administration of Justice of the Committee on the Judiciary asked the Patent and Trademark Office and the Copyright Office to undertake a joint study concerning certain overlaps of protection under the U.S. patent and copyright laws. The Subcommittee had questioned policies regarding overlap during hearings on legislative proposals to establish sui generis design protection.¹

The United States does not now provide specific design protection for all kinds of manufactured goods. In recent years, competitive international trade pressures have caused the United States to focus greater attention on protection of intellectual property. American products embodying American creativity and innovation succeed very well in the world market-place. Consequently, the question of whether sufficient protection is available for American designs has been raised anew. When considering whether or not to increase protection, Congress is always concerned about what increased protection means for the consumer.

It was in this context that the Subcommittee wanted more information on existing protection under the copyright and patent systems. In particular the Subcommittee asked the study to address the following issues:

¹ See App. A.

1. Whether either agency has or both agencies have an election of remedies policy, and, if so, what the authority is for such a policy; if there is such a policy, how many claims (by subject matter) are rejected based on a requirement of election?
2. Whether in the particular agency's opinion there is a complete or only partial overlap in claims--whether, for example, in the case of a computer program that has received a certificate of copyright registration, a patent for the program would be coextensive with the protection afforded by the copyright law?
3. Information on agency practices with respect to so-called computer program "user interfaces"--screen displays and the components thereof, such as commands and icons.

The study examines the possible overlap between the copyright and patent laws. In particular, the study discusses two issues relating to copyright/patent overlap in detail. One of these issues concerns the extent to which either the Copyright Office or the Patent and Trademark Office requires a claimant to elect between securing copyright or design patent protection. The other issue relates to the protectibility of so-called computer program "user interfaces"--screen displays and the components thereof, such as commands and icons.

Each system of intellectual property protects certain subject matter for a fixed term, and each has limits on the protection provided. In situations where two or more laws address totally different aspects of intellectual property, there would appear to be no apparent problem with seeking protection under all applicable theories since there would be no area of overlap.

II. POSSIBLE OVERLAP AMONG THE UTILITY PATENT, DESIGN PATENT, AND COPYRIGHT LAWS

To the best of our knowledge, the term "overlap" does not have any special legal significance and may have different interpretations. Regardless of which interpretation is applied, it is common in the federal and state legal systems to have overlapping laws. A specific act may violate several criminal statutes. Sale of a defective product may give rise to liability under tort and contract law. In the intellectual property area, overlap is also common. A dispute regarding patent or copyright licenses may generate cause of action for patent or copyright infringement, unfair competition, and breach of contract. Some inventions that may be protectible under the patent law may also be protected as trade secrets. Some commentators believe that under some circumstances a pattern of patent or copyright infringements may violate the Racketeer Influenced and Corrupt Organizations statute (RICO).²

While a study could encompass reviews of all possible areas of overlap in intellectual property laws, we have chosen to limit our inquiries in this study to those matters requested. To provide a basis for discussing the possible "overlap" among the copyright, patent, and design patent laws, we believe it is useful to provide a brief summary of the protection provided by these laws.

² Cooley, RICO: A New Weapon in Intellectual Property Law, JPOS, Vol 66, No. 3, p. 138, 1984; and Adamo and Ducatman, Civil Rico-Are Patents Next?, JPOS, Vol. 66. No. 4, p. 185, 1984.

A. GENERAL COVERAGE OF RESPECTIVE LAWS

1. Patent Laws.

a. Utility Patents. Utility patent protection is available for new and useful inventions in four statutory classes of subject matter-- processes, machines, manufactures, and compositions of matter--and any new and useful improvements thereof.³ Only those inventions that are "useful solely in the utilization of special nuclear material or atomic energy in an atomic weapon" are excluded from patentability by statute.⁴

Over the years, however, the courts have identified types of discoveries or inventions that do not fall within the four patentable statutory classes. A naturally occurring article, unless substantially altered, is not a "manufacture."⁵ In addition, inventions consisting of printed matter,⁶ methods of doing business,⁷ purely mental steps,⁸ naturally occurring phenomena or laws of nature,⁹ and scientific truths and their mathematical expression¹⁰ do not constitute patentable subject matter.

³ 35 U.S.C. §101 (1952).

⁴ Atomic Energy Act of 1954, §151, 42 U.S.C. §2181 (1961).

⁵ Diamond v. Chakrabarty, 447 U.S. 303, 206 USPQ 193 (1980).

⁶ In re Miller, 418 F.2d 1392, 164 USPQ 46 (CCPA 1969).

⁷ In re Wait, 73 F.2d 982, 24 USPQ 88 (CCPA 1934).

⁸ In re Prater, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969); In re Musgrave, 431 F.2d 882, 167 U.S.P.Q. 280 (CCPA 1970).

⁹ O'Reilly v. Morse, 56 U.S. (15 How.) 62 (1853).

¹⁰ MacKay v. Radio Corp., 306 U.S. 86, 40 U.S.P.Q. 199 (1939).

With the advent of digital computers, some experts questioned whether inventions involving steps performed by digital computers were patentable subject matter or were excluded from patentability because they represented scientific truths or mathematical expressions or algorithms. In Diamond v. Diehr,¹¹ the Supreme Court stated:

Our earlier opinions lend support to our present conclusion that a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program or digital computer.

We recognize, of course, that when a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of our patent laws.... On the other hand, when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patents were designed to protect (e.g., different state or thing), then the claim satisfies the requirements of §101.

The Court of Appeals for the Federal Circuit and its predecessor court have provided guidance on conducting the inquiry mandated by the Supreme Court. Appendix B provides a comprehensive discussion on the patentability of inventions involving mathematical algorithms. Although the applicable statutes or treaties differ, the concepts of patentable inventions and the examination practices in the U.S. Patent and Trademark Office, the European Patent Office, and the Japanese Patent Office are not fundamentally

¹¹ Diamond v. Diehr, 450 U.S. 175, 209 U.S.P.Q. 1 (1981).

different. Appendix C contains a report on the "Patentability of Computer-Related Inventions."

Not only do the patent laws require that, to be patentable, an invention fall within one of the statutory classes of patentable subject matter and be new and useful, they also require that an invention be nonobvious to one of ordinary skill in the technological area to which the invention pertains. Furthermore, the disclosure in the patent application must be sufficient to enable one skilled in the technological area of the invention to make and use the invention and must identify the best mode contemplated by the inventor of carrying out the invention.

Once the patent is granted, the patent owner has the right to exclude others from making, using, or selling the invention claimed in the patent. This protection extends even to inventions that are independently created. The term of protection lasts 17 years from the date of grant if maintenance fees are paid at specified times. For certain pharmaceutical products, medical devices, and animal drugs, a portion of the term may be restored to compensate for delays in marketing due to federal pre-market clearance requirements.

b. Design Patents. A design patent is available for a design of any article of manufacture if the appearance of the article is new, original, ornamental and nonobvious.¹² No exclusions from design patent protection are enumerated in the statute. However, the courts have indicated that designs which are primarily functional rather than primarily ornamental may not be protected by a design patent.¹³ Under the design patent law, the

¹² 35 U.S.C. §171 (1952).

¹³ Power Control v. Hybernetics, 806 F.2d 234, 238, (Fed. Cir. 1986).

patentee has the right to prevent others from making, using, or selling an article embodying the protected design for a period of fourteen years from the grant of the patent.¹⁴ This protection also extends to designs that are independently created.

2. Copyright Laws.

Prior to 1978, the United States had a dual system of copyright whereby published works were protected under the federal copyright statute and unpublished works were protected by common law copyright under state law. The 1909 Copyright Act strengthened the federal copyright system by authorizing the registration of many types of unpublished material. The 1976 Copyright Act¹⁵ preempted state common law copyright. Since 1978, all rights equivalent to copyright are secured under the federal copyright law.

In general, the 1976 Copyright Act protects all "original works of authorship fixed in any tangible medium of expression." This includes eight broad categories of material: (1) literary works, including computer programs; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic and sculptural works; (6) motion pictures and other audio-visual works; (7) sound recordings; and (8) architectural works.

Federal copyright law provides a lengthy term of copyright protection.¹⁶ Works created on or after January 1, 1978, are automatically

¹⁴ 35 U.S.C. §§173, 289.

¹⁵ 17 U.S.C. §§101-810.

¹⁶ See 17 U.S.C. §302.

protected from the moment of creation, and ordinarily given a term enduring for the author's life plus fifty years.

Although many intellectual works may qualify as "original works" under the copyright law, it is clear that some of these works will not be able to secure protection for lack of copyrightable expression. In order to qualify for copyright, a work must be original (that is done without infringing copying) and must contain a minimal amount of such original creative expression. Works are unable to qualify for copyright protection if they consist solely of familiar symbols, facts, words and short phrases, such as names, titles, and short phrases, variations in lettering, and mere listings of ingredients or contents.

Ideas are also excluded from copyright protection. This concept is generally articulated in section 102(b) of the copyright law exempting from protection "any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such a work." ¹⁷

The so-called "separability" test establishes another important exclusion for arguably artistic designs of useful articles. Section 101 defines "pictorial, graphic, and sculptural works" as: "the design of a useful article . . . shall be considered a pictorial, graphic, or sculptural work only if, and only to the extent that, such design incorporates pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article." ¹⁸

¹⁷ 17 U.S.C. §102(b). See also the regulation at 37 C.F.R. §202.1 (1990).

¹⁸ 17 U.S.C. §101.

Thus, while copyright law offers broad protection with respect to property within its ambit including a lengthy term of protection, a number of significant limiting doctrines or exclusions also apply. One of the most important exclusions limits the copyright to a prohibition against the copying of an author's work. Independent creation of a similar appearing work, or even an identical work, is a complete defense to a copyright infringement action.

B. IDENTIFICATION AND EVALUATION OF AREAS OF POSSIBLE OVERLAP.

Many works or products cannot receive protection under the copyright and patent laws. The fact that a product receives no protection, however, does not necessarily mean that creating the product required little intellectual input.

Intellectual property complaints commonly allege more than one legal theory as a basis for relief, but each of the legal theories usually addresses a discrete aspect of the controversy. Generally, rights under copyright protect an author's expression against copying, and rights granted under other laws address different concerns. Cases raising alternative theories of protection addressing distinct matters do not raise overlap concerns because the subject matter protected is not identical. In a few instances, however, protection for an author's expression may be sought under both copyright and another theory. In such circumstances, public policy issues associated with overlapping protection may be raised.

1. Copyright and Utility Patents.

In general, there appear to be few common elements in the subject matter capable of protection under the respective statutes. Copyright

protects only an author's expression, and specifically excludes protection for ideas, procedures, processes, systems, methods of operation, concepts, principles, or discoveries. On the other hand, utility patents are limited to inventions that are processes, machines, manufactures, or compositions.

The exclusion of protection in section 102(b) of the Copyright Act for ideas, discoveries, concepts, principles, and the like, does not deter proprietors from seeking copyright protection in patentable inventions if, in their view, the product also contains copyrightable expression. It is possible that in some circumstances, one product could contain elements which qualified as a patentable invention, and elements which contained copyrightable expression.¹⁹ In such circumstances, it would appear the protection of the respective patent and copyright laws would apply to the elements falling within each statute. However, it is unlikely that general patent protection and copyright could apply to the same subject matter.

One recent case concerning the KOOSH ball, a well-known children's toy, raised dual patent and copyright claims.²⁰ The KOOSH ball is a product formed by hundreds of floppy, wiggly, elastomeric filaments radiating from a core. The KOOSH ball was originally developed to teach youngsters with poor eye-to-hand coordination how to play catch; it is easily grasped if any portion of a person's hand contacts it.

¹⁹ An example of such a work is the MICKEY MOUSE telephone. The Patent Office granted both a utility patent on such a telephone covering certain mechanical components (patent issued on May 2, 1978, No. 4,087,650) and a design patent. (Design patent issued on Oct. 24, 1978, Des. 250,023). The Copyright Office would have regarded the sculpture of MICKEY MOUSE as copyrightable, meeting the separability test.

²⁰ OddzOn Products, Inc. v. Oman, 924 F.2d 346 (D.C. Cir. 1991).

The proprietor of the KOOSH ball successfully secured a utility patent from the Patent and Trademark Office. ²¹ The Copyright Office refused registration due to a lack of copyrightable authorship. The ball's filaments define a sphere, which, as a familiar symbol, cannot be the basis of a copyright claim. The tactile feel of the object relates to the functional aspects of the article, and is not the subject matter of copyright. ²²

We conclude that the subject matter overlap in the two statutes appears to be minimal. We believe this conclusion applies to computer related expressions and inventions. Copyright protection is only available for the expression in a computer program, not any underlying process. Patent protection is only available for a process performed on a computer if the process is not merely a mathematical algorithm or scientific principle. Patent protection is not available for computer programs per se. We do not believe that copyright and utility patent protection is coextensive.

It should be noted, that some "overlap" in protection may exist. Steps in a patented process may be performed according to a program executed by a computer. During the life of the patent, use of a program -- protected by copyright or unprotected by copyright -- to practice the patented process or part of the process, may infringe the patent if the use was not authorized by the patent owner. Also, the patent owner may not reproduce for use the copyrighted program of another without authorization before or after the expiration of the patent. Furthermore, copyrighted computer programs disclosed in patent documents to meet "enabling" and "best mode" requirements

²¹ Patent No. 4,756,529.

²² Both the district court and the court of appeals concluded that the Register's refusal to register was not an abuse of discretion.

will likely have terms of protection that extend beyond the term of the patent in which they appear.

2. Design Patent and Copyright.

The circumstances appear to be substantially different regarding overlap between the copyright law and the design patent law. It is recognized that in some cases a given design qualifies for protection under both statutes. More specifically, artistic expression which is embodied in a useful article may qualify for copyright protection as a pictorial, graphic, or sculptural work if it is a work of artistic craftsmanship or contains identifiably separate artistic authorship. These works of authorship may also be subject matter under the design patent law. It should be noted, however, many designs that are patentable subject matter under the design patent law are not copyrightable subject matter.

Most of the items protectible under the design patent law lack the separable artistic features necessary to secure copyright and are, therefore, excluded by the separability test. Nevertheless, occasionally proprietors who have successfully secured design patent protection on a useful article lacking separable artistic features will attempt to secure the additional protection afforded by copyright. In Trans-World Manufacturing Corp. v. Al Nyman & Sons Inc., the proprietor successfully secured the grant of design patent protection in two eyeglass display cases.²³ The Copyright Office refused to register the two display cases on the grounds that they lacked separable artistic features. The proprietor filed a complaint against an alleged infringer, on both copyright infringement and the design patent

²³ 750 F.2d 1552 (Fed. Cir. 1984).

claims. The Copyright Office filed a brief supporting its refusal to register under section 411(a) procedures. Then the proprietor dropped the copyright claims and proceeded to litigate the matters relevant to the design patent claims.

Occasionally, even patented designs do not meet the originality and creativity standards applied by the Copyright Office. In one such instance the Patent and Trademark Office issued a design patent on a jewelry design for a ring with stone settings placed in a straight line.²⁴ The Copyright Office refused registration of the same design on the grounds that the straight line settings failed to meet the originality and creativity standards of the copyright law.²⁵

The categories of articles possibly qualifying under both design patent and copyright cover a wide range. Many are three-dimensional toys and models that are representational in nature. Certain jewelry designs, such as the Spiro Agnew watch in In re Yardley may qualify under either statute, as can furniture items, such as representational lamp bases, and appliances like the Mickey Mouse telephone. During fiscal year 1990, the U.S. Patent and Trademark Office issued 7,176 design patents. Of these, the Copyright Office estimates that only a few hundred would qualify for copyright protection if proprietors were allowed to secure dual protection.²⁶

²⁴ Des. 258,123, Ring.

²⁵ Nova Stylings, Inc. v. Ladd, 695 F.2d 1179 (9th Cir. 1983).

²⁶ Based on an informal study of design patents published in the Official Gazette, February 3-10, 1981.

III. ELECTION OF REMEDIES

A. COPYRIGHT OFFICE POLICY REGARDING ELECTION ²⁷

Currently, the Copyright Office policy with respect to overlapping protection is restricted to dual protection of the same design by the patent and copyright design laws. ²⁸ The Copyright Office stance on this issue requires an election: in order to obtain registration of a claim to copyright in a work potentially protectible under design patent, the rightsholder must elect to seek copyright registration prior to the issuance of a design patent. This policy is expressed in 37 C.F.R. §202.10(a) and (b):

[a] In order to be acceptable as a pictorial, graphic, or sculptural work, the work must embody some creative authorship in its delineation or form. The registrability of such a work is not affected by the intention of the author as to the use of the work or the number of copies reproduced. The potential availability of protection under the design patent law will not affect the registrability of a pictorial, graphic, or sculptural work, but a copyright claim in a patented design or in the drawings or photographs in a patent application will not be registered after the patent has been issued.

[b] A claim to copyright in a scientific or technical drawing, otherwise registrable as a

²⁷ The following are the views of the U.S. Copyright Office, and, as such, do not necessarily reflect the views of the U.S. Patent and Trademark Office.

²⁸ In doing research for this study, the Copyright Office discovered an emerging trend of cases involving overlap of the copyright laws with section 43(a) of the "Trademark Act of 1946, as amended, (15 U.S.C. 1125). Since the letter requesting this study restricted the inquiry to an overlap of the patent and copyright laws, the Copyright Office has not included a discussion of these cases in this study.

pictorial, graphic, or sculptural work, will not be refused registration solely by reason of the fact that it is known to form a part of a pending patent application. Where the patent has been issued, however, the claim to copyright in the drawing will be denied copyright registration.

This policy, first reflected in regulations issued in 1956, is derived from case law. No election is required in the case of works registered as computer programs, since this policy applies only to pictorial, graphic and sculptural works, i.e., designs, and useful articles that may also be protectible under design patent.

In 1974, the Court of Customs and Patent Appeals decided In re Yardley ²⁹ and refused to apply the election principle to invalidate design patent protection for an ornamental wristwatch. In light of Yardley, the Copyright Office reconsidered its election policy in 1975.

In 1975, the U.S. Patent and Trademark Office maintained a policy of requiring the removal of copyright notices from patent applications published in the Official Gazette. This practice fostered divestment of copyright protection through publication without notice. ³⁰ For this and other reasons discussed below, the Copyright Office decided not to modify its policy.

²⁹ 493 F.2d 1389 (C.C.P.A. 1974).

³⁰ 1077 Official Gazette Pat. Off. 22 (April 21, 1987). In 1987, the U.S. Patent and Trademark Office changed its practice by permitting the inclusion of copyright and mask work notices on applications, subject to certain limitations.

1. Overlap Between Design Patent and Copyright Before Mazer v. Stein.

Before the 1954 landmark case of Mazer v. Stein, a number of courts considered the policy implications of overlapping protection under design patent and copyright. The election doctrine was first articulated in Louis de Jonge & Co. v. Breuker & Kessler Co. ³¹ That case questioned whether or not a painting depicting an array of sprigs and branches of holly, mistletoe, and spruce which was intended to be printed on gift wrapping paper could properly be brought within the copyright law.

The defendant argued that the intended use of the painting--as an article of manufacture such as wrapping paper, was not proper copyrightable subject matter and could secure protection, if at all, only under the design patent statute. The court disagreed, emphasizing that the intended use of a work had no effect on the type of protection for which it could qualify, and held that the artist was free to elect either copyright or design patent, but could not have both. Judge McPherson declared:

Since it was qualified for admission into the two statutory clauses, I see no reason why it might not be placed in either. But it could not enter both. . . . [I]t can have protection in only one of these classes. The author or owner is driven to his election, and must stand by his choice. ³²

In a 1927 decision In re Blood, the D.C. Court of Appeals embraced the election doctrine of the de Jonge case. ³³ The claimant sought design protection in a hexagonally-shaped hosiery ticket. The ticket had previously

³¹ 182 F. 150 (C.C.E.D. Pa. 1910) aff'd, 191 F. 35 (3d Cir. 1911), aff'd, 235 U.S. 33 (1914).

³² Id. at 152.

³³ 23 F.2d 772 (D.C. Cir. 1927).

secured copyright protection through registration as a label. The Court upheld the denial of registration by the Commissioner of Patents:

The applicant was entitled to apply for a patent for the design as a hosiery label, or he might complete the label, and register the design, so completed, as a label. He could not do both. He elected to pursue the latter course, and has obtained the protection thereby assured to him, and he is bound by that election.³⁴

The de Jonge decision was followed in Jones Bros. Co. v. Underkoffler,³⁵ involving the copyrightability of tombstones. The court ruled that "[i]n a case which comes under either statute, it becomes a matter of choice by the author or owner whether he will seek protection under the patent or copyright law."³⁶

Because it involved directly the invalidation of a copyright, the Second Circuit decision in Korzybski v. Underwood & Underwood, Inc. formed the primary basis for the Copyright Office's acceptance and application of the election doctrine.³⁷ The subject of the litigation was an anthropometer, a plastic teaching aide enabling the study of human thought processes. The creator of the anthropometer obtained a design patent for the work, and additionally registered technical drawings of the device with the Copyright Office. The defendant photographed the three-dimensional anthropometer and was charged with infringing the copyright.

³⁴ Id. at 772.

³⁵ 16 F.Supp. 729 (N.D. Pa. 1936).

³⁶ Id. at 730-31.

³⁷ 36 F.2d 727 (2nd Cir. 1929).

The court found the copyright invalid. It ruled that the pictorial representation of the anthropometer entered the public domain as a result of issuance of the patent because:

When Korzybski filed his application and received his patent, he made a full disclosure of his invention and dedicated it to the public, save for the right to make, use, and vend it during the period for which the patent gave him that monopoly. The public had the right to the information disclosed in his patent and right to use and copy the text and diagrams. Section 7 of the Copyright Act . . . provides: "That no copyright shall subsist in the original text of any work which is in the public domain." Everything disclosed in the patent became a part of the public domain, except the monopoly of the patentee to make, use, and vend the patented device for a limited time.

The filing of the application for the patent, including, of course, the diagrams, was a publication that entitled anyone to copy the drawings. Callighan v. Myers, 128 U.S. 617 We cannot see that the complainant has disclosed anything different in his copyright from that which appears in his patent. . . . An inventor who has applied for and obtained a patent cannot extend his monopoly by taking out a copyright under section 5(i) of the Copyright Law, 17 USCA Section 5(i), on what he has already diagrammatically disclosed.³⁸

Ex Parte Guild is a patent case frequently cited as favoring the election theory.³⁹ In that case the Copyright Office had registered a colored photograph of a roof design, and the patent examiner cited this copyright registration as one ground for refusal to issue a design patent.

³⁸ Id. at 728-29.

³⁹ 98 U.S.P.Q. 464 (Pat.Off.Bd.App. 1952), aff'd on other grounds, 204 F.2d 700 (C.C.P.A. 1953).

The Board of Patent Appeals agreed that the design registered by the Copyright Office and the application for a design patent were the same and that the appellant was not entitled to double registration.

2. Overlap Between Utility Patents and Copyright Before Mazer v. Stein.

Most of the cases concerning overlap between the patent and copyright laws focused on the design patent law, and until 1974 consistently applied the election rule. Several cases, however, considered the issue in relation to the law covering utility patents. When the scope of coverage of mechanical patents is contrasted with copyright, the courts tend to view the statutes as being mutually exclusive.

Baker v. Selden⁴⁰ serves as bedrock opinion for the view that patent and copyright are mutually exclusive. In that case, the Supreme Court ruled that a system of bookkeeping consisting of arrangements of lines, columns, and headings could not properly invoke protection under the copyright law. Instead, protection, if available at all, had to be secured under the patent law:

To give to the author of the book an exclusive property in the art described therein, when no examination of its novelty has ever been officially made, would be a surprise and a fraud upon the public. That is the province of letters-patent, not of copyright. The claim to an invention or discovery of an art or manufacture must be subjected to the examination of the Patent and Trademark Office before an exclusive right therein can be obtained; and it can only be secured by a patent from the government.⁴¹

⁴⁰ 101 U.S. 99 (1879).

⁴¹ Id. at 102.

The Seventh Circuit applied the rationale of the Baker decision in Taylor Instrument Companies v. Fawley-Brost Co.,⁴² a case involving a device for recording thermometer readings. The device consisted of a number of elements, including a clock, a thermometer, and a writing instrument which recorded the hourly temperature on a lined chart. The claimant attempted to enforce protection in his device by asserting copyright on the graphical chart on which the readings were recorded. The court concluded that copyright in such an essential part of a machine could not be invoked:

Thus it appears that Congress has provided two separate and distinct fields of protection, the copyright and the patent. In the former (Sec. 4), it has placed "all the writings of an author," and in the latter (Sec. 31), inventions and discoveries of "any new and useful art, machine, manufacture * * * or any new and useful improvements thereof * * * ." While it may be difficult to determine in which field protection must be sought, it is plain, so we think, that it must be in one or the other; it cannot be found in both. In other words, there is no overlapping territory, even though the line of separation may in instances be difficult of exact ascertainment.⁴³

The issues discussed in Taylor were revisited in Brown Instrument Co. v. Warner,⁴⁴ a case directly involving the Copyright Office. The claimant sought copyright registration for calibrated charts used in recording apparatus similar to those in Taylor. In sustaining the refusal of the Register of Copyrights to register the claims, the court noted strong

⁴² 139 F.2d 98 (7th Cir. 1943).

⁴³ Id. at 99.

⁴⁴ 161 F.2d 910 (D.C. Cir. 1947).

public policy grounds against extending the patent monopoly in the recording machines:

Articles intended for practical use in cooperation with a machine are not copyrightable Both law and policy forbid monopolizing a machine except within the comparatively narrow limits of the patent system. In several patents on recording machines, the necessary printed chart is rightly claimed as one of the operative elements. Since the machines which cooperate with the charts in suit are useless without them, to copyright the charts would in effect continue appellant's monopoly of its machines beyond the time authorized by the patent law.⁴⁵ (Emphasis added).

3. The Mazer v. Stein and Vacheron Watches Decisions.

Prior to Mazer v. Stein, the cases on overlap of the patent/copyright statutes fell into two camps. Where an overlap between design patent and copyright was found, courts affirmed that a claimant could proceed under either theory but not under both. The election theory found little relevance in cases comparing utility patents with copyrights, since courts have tended to reinforce the mutually exclusive character of the underlying statutes.

The relative consistency of the holdings, however, concealed a more fundamental ambiguity concerning the extent to which useful articles could secure protection under the copyright law.⁴⁶ This uncertainty became apparent in the litigation over the Stein lamp bases when lower courts reached conflicting results.

⁴⁵ Id. at 911.

⁴⁶ See generally Note, Protecting the Artistic Aspects of Articles of Utility: Copyright or Design Patent, 66 Harv. L. Rev. 877 (1953); Pogue, Borderland--Where Copyright and Design Patent Meet, 52 Mich.L.Rev. 33 (1953).

In Mazer v. Stein ⁴⁷ the plaintiff created semivitreous china statuettes of male and female dancing figures and secured registration of claims to copyright in them as works of art. It was clear that the works could have been marketed as statues; and in fact a few copies were marketed in such a fashion. But, the vast bulk of the statues were converted into lamp bases and as such proved to be an outstanding commercial success.

The Circuits were clearly divided on the issue of whether the design patent law served as the only available form of protection for the plaintiff. The Seventh Circuit, following its rationale in the Taylor case, and concluded copyright was unavailable to protect lamp bases. ⁴⁸ The Ninth and Fourth Circuits reached opposite conclusions. ⁴⁹

Since the Mazer litigation raised an issue which had long troubled the Copyright Office, the progress of the case was closely followed. After many years of trying to articulate reasonable bounds of protection for works of art put to utilitarian uses, the Register of Copyrights concluded that the nature of use of an article was not a reasonable basis on which to rest a governing principle of the copyright law. The Copyright Office filed an amicus curiae brief when the case was pending in the Fourth Circuit. The brief defended the copyrightability of the Stein lamp bases, largely on the basis of prior registrations of similar material. When the case reached the Supreme Court the amicus brief was refiled.

⁴⁷ 347 U.S. 201 (1954).

⁴⁸ Stein v. Expert Lamp Co., 188 F.2d 611 (7th Cir. 1951).

⁴⁹ Rosenthal v. Stein, 205 F.2d 633 (9th Cir. 1953); Stein v. Mazer, 204 F.2d 472 (4th Cir. 1953).

The Supreme Court was presented with the precise issue of whether a work which was clearly a "work of art" even in its classic fine arts sense could be denied copyright protection merely due to the use to which the work was put. Like the Copyright Office, the Supreme Court saw no reason for determining the issue of copyrightability by looking at whether a work is theoretically protectible under the design patent law.

Mr. Justice Reed wrote that copyrightable works of art, such as the statuette in question, did not lose protection upon embodiment in a lamp. This holding settled one issue which had long troubled the Copyright Office. But the Court offered no explicit guidance in properly drawing the line separating copyrightable works of applied art from uncopyrightable industrial designs, other than its approbation of the Copyright Office's existing regulation regarding works of artistic craftsmanship.

Since Stein had not sought design patent protection for the statuettes, the case did not directly raise the issue of election of protection. Nevertheless, the Court raised the issue itself, only to note that the principle of mutual exclusivity did not apply to the copyright and patent statutes insofar as works of art were concerned. On the precise question of election, the Court adopted a neutral stance:

As we have held the statuettes here involved copyrightable, we need not decide the question of their patentability. Though other courts have passed upon the issue as to whether allowance by the election of the author or patentee of one bars the grant of the other, we do not. We do hold that the patentability of the statuettes, fitted as lamps or unfitted, does not bar copyright as works of art. Neither the Copyright Statute nor any other says that because a thing is patentable it may not be copyrighted. We should not so hold. ⁵⁰

⁵⁰ 347 U.S. at 217.

Vacheron Watches, Inc. v. Benrus Watch Co., Inc. is another celebrated case producing an ambiguous statement on whether simultaneous protection can exist under design patent and copyright in the same subject matter.⁵¹ In this case, the claimant sought to invoke both the design patent statute and the copyright law to protect a stylized, jeweled watch, lacking in pictorial representation. Copyright registration of the watch was twice rejected for lacking copyrightable content.

The district court agreed with the Copyright Office that the copyright claim was invalid. However, the court upheld the design patent and found that the patent had been infringed. The district court further rejected arguments that seeking copyright protection precluded securing design patent protection.

On appeal, Judge Learned Hand affirmed rejection of the copyright claim on the limited grounds that the claimant had not successfully secured a copyright registration from the Copyright Office.⁵² As to the design patent claim, however, the court concluded the record was insufficient to determine nonobviousness, and the case was remanded for further proceedings. The court

⁵¹ 155 F.Supp 932 (S.D.N.Y. 1957), modified, 260 F.2d 637 (2d Cir. 1958).

⁵² This holding, in effect, required rejected copyright applicants to succeed in a mandamus action against the Register of Copyrights before proceeding with civil copyright remedies. The effect of this holding was eliminated by section 411 of the current copyright law, which allows rejected claimants to sue alleged infringers after first attempting to obtain copyright registration.

deflected assertions that design patent protection should have been invalidated due to the claimant's unsuccessful quest for copyright protection:

We need not discuss the defendant's further defense that it was not possible to secure both a copyright and a design patent upon the same disclosure. The Supreme Court in Mazer v. Stein, . . . did, indeed, decide that the same disclosure might support a design patent and a copyright, but it expressly refused to decide whether the grant of either monopoly precluded that of the other. On the other hand in Korzybski v. Underwood & Underwood, Inc., . . . we held that the grant of a patent presupposed a dedication to the public of the disclosure, except so far as the statute specifically reserved it to the patentee.

Since we are holding that there was no enforceable copyright in the watch, we need not now reconsider our decision; for we do not think that a copyright which is not enforceable, even though it may be theoretically in existence, is an obstacle to securing and enforcing a patent. The doctrine of Korzybski v. Underwood & Underwood, . . . must rest upon the assumption that the owner of the statutory monopoly has some power to protect his "work," for otherwise any dedication would be without consideration.

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4. The 1956 Copyright Office Regulation.

The Copyright Office had strongly supported the copyrightability of the Stein lamp bases during the Mazer litigation. There was a strong consensus within the Copyright Office that a copyrightable work of art should not be denied copyright protection merely because the work was applied to accomplish useful functions. However, there was wariness that the extension of this logic risked sweeping into the copyright law virtually the entire

field of industrial designs. ⁵⁴ The Mazer opinion provided few clues as to objective standards for separating copyrightable works of applied art from uncopyrightable industrial designs.

In 1956, the Copyright Office attempted to delineate objective standards by issuing new regulations on works of art. Paragraph (b) of that regulation attempted to codify the Mazer decision, and establish Copyright Office policy with respect to design patent/copyright overlap. It provided,

(b) In order to be acceptable as a work of art, the work must embody some creative authorship in its delineation or form. The registrability of a work of art is not affected by the intention of the author as to the use of the work, the number of copies reproduced, or the fact that it appears on a textile material or textile product. The potential availability of protection under the design patent law will not affect the registrability of a work of art, but a copyright claim in a patented design or in the drawings or photographs in a patent application will not be registered after the patent has been issued. ⁵⁵

The Copyright Office's overriding concern was to articulate generally applicable objective standards which could be used as a basis for refusing registration. The Office was concerned that without such standards, any claimant of an arguably attractive useful article could compel copyright registration. In comparison with these broad concerns of the Copyright

⁵⁴ Beginning in 1914, bills proposing to create protection in industrial designs had been introduced with great regularity in both Houses of Congress. The clear implication of these proposals was that protection was not currently available under the copyright law. Congress's failure to enact any of the proposals is evidence either that Congress had concluded that industrial designs did not merit protection or that the problems associated with such protection were too great.

⁵⁵ 37 C.F.R. §202.10 (1956).

Office, the issue of simultaneous protection under both patent and copyright was a relatively minor matter.

The Copyright Office concluded, however, that simultaneous copyright and design protection could not exist. Although the Supreme Court had expressly refused to rule on the issue in Mazer, all prior judicial decisions had consistently held that simultaneous protection could not exist in the same subject matter. In addition, copyright notice cases consistently held general publication without notice divested protection, and these cases, along with the Patent and Trademark Office's maintaining its policy of excluding copyright notice from issued patents published in the Official Gazette, seemed to foreclose the possibility of continued copyright protection.

In 1968, the Copyright Office re-examined the issue of dual protection and concluded that the Copyright Office regulation should remain intact on at least two alternative grounds:

1. Public policy considerations--With different standards for protection terms of protection, the same artistic design should not be accorded double protection under patent and copyright. It is an undue extension of the patent monopoly to grant a copyright to the same design protected by a patent after the patent has expired. The intent of the patent law is that the public should have the benefit of the design after the patent expires; that is why the patent is granted.
2. Divestitive publication--As part of the procedure in issuing a patent, the design is published in the Patent Gazette without notice of copyright. It is the intent of such publication to destroy copyright and make the work available to the public at the end of the patent term. In any case, a publication without notice does cause loss of copyright. The applicant is aware of this effect at the

time he elects design patent and should be held to his election.⁵⁶

Given the consistent case law support for the proposition that design patent and copyright could not co-exist in the same subject matter, the study concluded the policy delineated in the regulations should be continued.⁵⁷

5. The In re Yardley Decision.

The uniformity of the case law against simultaneous protection under design patent and copyright was shattered in 1974 by In re Yardley.⁵⁸

⁵⁶ Id. at 4.

⁵⁷ The Copyright Office policy was criticized by the late Professor Melville B. Nimmer. In his treatise on copyright Nimmer argued:

Without offering the rationale of publication or any other basis, Copyright Office regulations simply provide that once a patent has been issued copyright registration will be denied to a work of art and to a scientific or technical drawing. There appears to be no statutory or other justification for this position. It would seem on principle that if a work otherwise meets the requirements of copyrightability, it should not be denied such simply because the claimant happens to be entitled to supplementary protection under other legislation. [citing Barton Candy Corp. v. Tell Chocolate Novelties Corp., 178 F.Supp. 577 (E.D.N.Y. 1959)]. In any event, such regulations go beyond the teachings of a recent case which suggest that even if a patent has been issued, if such patent is subsequently found to be invalid, then copyright protection should be available. [citing Vacheron, supra.].

The Copyright Office study noted that the Barton Candy design patent and the copyright registration did not cover the same subject matter; the design patent covered the configuration of the carton; the copyright covered the two dimensional pictorial authorship.

⁵⁸ 493 F.2d 1389 (C.C.P.A. 1974).

A Spiro Agnew watch displaying a caricature of Agnew clad in star-spangled shorts was the subject matter of this litigation. The hands of the watch doubled as the hands and arms of the caricature. The face of the watch contained a copyright notice, and copyright registration as a work of art was secured on the watch face.

The patent examiner refused to issue a design patent on the watch on the grounds of obviousness and the prior copyright registrations. The Patent Office Board of Appeals affirmed the rejection. On appeal to the Court of Customs and Patent Appeals, the rejection was reversed.

After dismissing the objections concerning obviousness, the court turned to the election theory. The court was in full agreement that design patent and copyright created a significant area of overlap. However, the court disagreed that in cases of overlap, the claimant was required to make an election:

We believe that the "election of protection" doctrine is in direct conflict with the clear intent of Congress manifested in the two statutory provisions quoted above. The Congress has provided that subject matter of the type involved in this appeal is "statutory subject matter" under the copyright statute and is "statutory subject matter" under the design patent statute, but the Congress has not provided that an author inventor must elect between securing a copyright or securing a design patent. Therefore, we conclude that it would be contrary to the intent of Congress to hold that an author inventor must elect between two available modes of securing exclusive rights.⁵⁹

The court conceded that In re Blood, supra, and Ex Parte Guild, supra, directly supported requiring an election. However, the court said

⁵⁹ Id. at 1394.

these decisions were based on the De Jonge case, and De Jonge's endorsement of an election theory was deemed dicta. As a result, the court concluded there was no "positive legal authority supporting" the election theory. ⁶⁰

The brief of the Commissioner of Patents raised the policy argument that allowing copyright to subsist in a work covered by design patent would extend protection beyond the term authorized by Congress. The court concluded that the policy argument was not a sound basis for refusing to issue the patent:

We agree that the copyright secured by appellant's assignee will outlive any design patent appellant may secure. The copyright "shall endure for twenty-eight years from the date of first publication," and is renewable "for the further term of twenty-eight years;" . . . whereas a design patent has a maximum term of fourteen years. . . . But the mere fact that the copyright will persist beyond the term of any design patent which may be granted does not provide a sound basis for rejecting appellant's design patent application. ⁶¹

Likewise, the court rejected policy arguments based on the Constitutional separation of the patent and copyright systems. In this regard, the court even implied that the underlying goal of the Constitution to encourage inventors and authors would better be accomplished by providing for "concurrent" protection:

We agree with the board's view that the framers of the Constitution recognized a distinction between "authors" and "inventors" and "writings" and "discoveries." But, we do not think that the constitutional provision requires an election. The Congress, through its legislation under the authority of the

⁶⁰ Id. at 1394-95.

⁶¹ Id. at 1395.

Constitution, has interpreted the Constitution as authorizing an area of overlap where a certain type of creation may be the subject matter of a copyright and the subject matter of a design patent. We see nothing in that legislation which is contradictory and repugnant to the intent of the framers of the Constitution. Congress has not required an author-inventor to elect between the two modes which it has provided for securing exclusive rights on the type of subject matter here involved. If anything, the concurrent availability of both modes of securing exclusive rights aids in achieving the stated purpose of the constitutional provision.⁶²

6. Copyright Office Reassessment in Light of In re Yardley.

As a result of the Yardley decision, the Copyright Office undertook another reassessment of the policy to refuse registration of subject matter covered by an issued design patent. The Copyright Office concluded that In re Yardley represented weak authority for reversal of a long-standing Copyright Office practice, supported by several court decisions.

Although the Yardley court did not foresee problems with dual protection, the court seemed unaware of the fact that issued patents were published in the Official Gazette without copyright notice. At the time of Yardley, the Copyright Office maintained a firm policy of refusing registration where general publication occurred without notice of copyright. It applied this policy with regularity, and omission of notice was one of the commonest reasons cited by the Office in refusals to register. Clearly, any change in practice to follow Yardley would have required the Copyright Office to overlook a general publication in the Official Gazette.

⁶² Id. at 1395-96.

By deciding, in effect, to continue following the decision in Korzybski over Yardley, the Copyright Office opted to rely on a decision under the copyright statutes over a decision limited to an interpretation of the design patent act. Yet, while the Yardley case was limited to an interpretation of the design patent act, it clearly rejected policy arguments against dual protection which were persuasive in Korzybski.

The Copyright Office maintained its regulation intact in the face of In Re Yardley because it concluded that the public policies underlying the prior jurisprudence were too fundamental to the interaction of design patent and copyright law in the public interest to be materially modified on the basis of a single, distinguishable, decision. This jurisprudence, in the view of the Office, has stressed the need to elect protection under design patent or copyright law.

7. Copyright Act of 1976.

Shortly after the implications of Yardley were considered, Esquire initiated its litigation over the copyrightability of its modernistic outdoor flood lamps. The Copyright Office had refused registration on the grounds of lack of separable artistic authorship. A federal district court had reversed that determination in an opinion which effectively invalidated Copyright Office regulations on works of art. ⁶³

The matter then shifted to Capitol Hill, which was actively considering the copyright revision bill. The House Subcommittee studied the issues with respect to applied art and industrial designs, and concluded that the policies of the Copyright Office were well founded. Accordingly, the

⁶³ Esquire v. Ringer, 414 F.Supp. 939 (D.C.D.C. 1976).

Congress clarified the coverage of "pictorial, graphic, and sculptural works" by incorporating the substance of the regulations into the definitions of the copyright revision bill,⁶⁴ and passed the Copyright Act of 1976.

The Esquire decision invalidating the Copyright Office regulation was appealed to the Court of Appeals. Against the backdrop of the copyright revision bill incorporating the standards applied by the Copyright Office, the Court of Appeals reversed the district court.⁶⁵

The ultimate success in the Esquire litigation, coupled with modification of the copyright revision bill to incorporate Copyright Office regulations vindicated the Copyright Office's interpretation of the Mazer decision. The primary focus of the Mazer litigation had been on the separability test, but overlap and dual protection featured in the decision. Of course, in Mazer the Supreme Court had expressly declined to rule on the issue of dual protection, but the Copyright Office continued to view its policies on the issue as being clearly consistent with Mazer.

The 1976 House Report⁶⁶ does not discuss dual protection of designs under patent and copyright, other than to repeat the language of the 1956 Copyright Office regulation⁶⁷ stating that "the potential availability of design patent protection" does not foreclose copyright protection for original pictorial, graphic, or sculptural works embodied in useful articles. The existing Copyright Office regulation⁶⁸ has the same caveat.

⁶⁴ H.R.Rep. No. 1476, 94th Cong. 2d Sess. p. 54-55 (1976).

⁶⁵ Esquire v. Ringer, 591 F.2d 796 (D.C. Cir. 1978).

⁶⁶ H.R. Rep. No. 1476, 94th Cong., 2d Sess. 54 (1976).

⁶⁷ 37 C.F.R. §202.10(b) (1956).

⁶⁸ 37 C.F.R. §202.10(a) (1990).

8. Modification of Patent and Trademark Office Policy with Respect to Copyright Notices.

Historically, one foundation of the Copyright Office's policy on dual protection was the concept of divestitive publication of the patented drawings in the Official Gazette. First, a general publication without copyright notice divested copyright protection.⁶⁹ Second, one of the primary purposes of publication in the Official Gazette, as seen by the Copyright Office, was to place material contained in the Gazette into the public domain upon expiration of the patent term.

In 1987, the Patent and Trademark Office announced in the Official Gazette a change in its policy with regard to copyright and mask work notices.⁷⁰ This announcement, entitled "Inclusion of Copyright or Mask Work Notices in Patents," ended the U.S. Patent and Trademark Office's practice of requiring the deletion of copyright and mask work notices. The announcement did require applicants who used notices to sign an authorization permitting facsimile reproduction for the administrative purposes of documenting and disclosing the patent. The Patent and Trademark Office reasoned as follows:

Under current intellectual property laws, it is possible to obtain copyright protection or mask

⁶⁹ Under the 1909 Copyright Act, courts were strict in divesting copyright for failure to include a notice of published copies. The 1976 Copyright Act liberalized the notice requirement. Under section 405, a copyright owner could preserve his copyright on works published without notice by registering within five years, and making "a reasonable effort" to "add notice to all copies or phonorecords that are distributed to the public." Despite the liberalized nature of the 1976 Act, it would have been difficult to apply section 405 to material published in the Official Gazette because it would have been impossible to add the notice to any copies of the Gazette.

⁷⁰ 1077 Official Gazette Pat. Off. 22 (1987).

work protection as well as patent protection for certain designs and technologies. On occasion, an author/inventor considers it desirable to include a notice of copyright or mask work in a design or utility patent which discloses material on which copyright or mask work protection has previously been established.

The inclusion of a copyright or mask work notice in a patent that discloses material on which copyright or mask work protection has previously been established, would serve to publicize and thereby protect the public by militating against an unintentional encroachment into these rights. The presence of an unrestricted copyright or mask work notice in a patent could have an inhibiting effect on public dissemination of the patent disclosure to the extent it discourages the facsimile reproduction of the patent. The possible effect would be contrary to the mission of the Patent and Trademark Office to disseminate knowledge and information publicly by way of patent issuance, publication, and distribution. To avoid this effect, it is considered necessary to include an appropriate authorization of the author/inventor with any copyright or mask work notice appearing in a patent. ⁷¹

In 1988, the regulations of the U.S. Patent and Trademark Office were formally modified to reflect the new policy with respect to copyright and mask work notices. When the modifications were first published as proposed changes in the Federal Register, the U.S Patent and Trademark Office reiterated the reasons that had appeared in the Official Gazette a year before. ⁷² The regulations formalizing the new policy provided:

(d) A copyright or mask work notice may be placed in a design or utility patent application adjacent to copyright and mask work material contained therein. The notice may

⁷¹ Id.

⁷² 53 Fed. Reg. 16522 (1988).

appear at any appropriate portion of the patent application disclosure. For notices in drawings, see §1.84(o). The content of the notice must be limited to only those elements required by law. For example "© 1983 John Doe" (17 U.S.C. §401) and "*M* John Doe" (17 U.S.C. §909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in paragraph (e) of this section is included at the beginning (preferably as the first paragraph) of the specification.

The authorization shall read as follows:

(e) A portion of the disclosure of this patent document contains material which is subject to (copyright or mask work) protection. The (copyright or mask work) owner has no objection to the facsimile reproduction by anyone of the patent document or patent disclosure, as it appears in Patent and Trademark Office patent file or records, but otherwise reserves all (copyright or mask work) rights whatsoever. ⁷³

9. Copyright Office Policies on Dual Protection During the 1980's.

The Copyright Office has not reopened issues associated with registering copyright claims in subject matter covered by an issued design patent during the 1980's. The general area of copyright protection in applied arts is highly litigated, and, as a result, modifying the regulations applying to "pictorial, graphic, and sculptural works" is not a matter lightly undertaken.

To date, the Korzybski decision appears to be the only case directly ruling on whether a copyright survives the issuance of a patent. In

⁷³ 37 C.F.R. §1.71(d) & (e).

that case, the Second Circuit ruled that it does not. The Copyright Office has found the Korzybski reasoning persuasive, and has based its practice on it. Obviously, if contrary case law or other legal authorities arise, the Copyright Office may reassess its position.

Since Yardley, no case has ruled on dual protection, either as regarding the issuance of a design patent on subject matter under copyright, or the continuation of copyright in material covered by an issued patent. Therefore, Yardley remains as a stand alone decision.

In general, Yardley has had relatively little impact on the protection of works of applied art. There has been virtually no citation to Yardley in the case law.⁷⁴ Treatises and other legal authorities often cite Yardley, along with the other contrary precedents, but tend to neither endorse it nor criticize it.⁷⁵

Despite the high degree of litigation in the area during the 1980's, no case has passed on whether copyright in a work of applied art survives the issuance of a design patent on the same subject matter. The absence of case law on the issue, moreover, cannot be attributed to the policy of the Copyright Office to refuse registration of material covered by an issued design patent. Claimants who wish to proceed on both theories of copyright and design patent may secure a copyright registration certificate

⁷⁴ Only one citation to Yardley has been located. In Apple Computer, Inc. v. Franklin Computer Corp., 545 F.Supp. 812 (E.D. Penn. 1982) rev. 714 F.2d 1240 (3rd Cir. 1983), the district court stated in a footnote the inapplicability of Yardley to the issues in the case. (See footnote 6 at page 817). The Court of Appeals reversed without reference to Yardley.

⁷⁵ DELLER'S WALKER ON PATENTS §173, Cumulative Supplement 1984 p. 417-18 (1984); CHISUM ON PATENTS §1.04[5] (1983); 83 ALR Fed. 845 (1987); R. GIVENS, BUSINESS TORTS AND COMPETITOR LITIGATION §5.11 (1988).

by registering before the design patent is issued.⁷⁶ Since design patent procedures take substantially longer than copyright registration procedures due to the search of the prior art, in most instances claimants will have received their copyright registration certificates long before the design patent is issued.

In the case of claimants who are tardy in seeking copyright registration, their copyright claims will be rejected if the Copyright Office is aware of the issuance of a patent. Even in these cases, however, the claimant is entitled to sue under section 411(a) of the copyright law. The effect of the refusal will be to shift the burden of proving copyright validity to the claimant at the outset of the litigation.

The existence of circumstances under which a copyright registration may be secured for a work which is the subject of a pending design patent, notwithstanding Office regulations denying the protectibility of such a work, suggests an administrative dimension to the election question. And, from a copyright viewpoint, that dimension is only marginally affected by the fact that the Copyright and Patent and Trademark Offices, operating from different statutory bases and constraints on their discretion, have different positions on election.

In a sense, it is possible to distinguish the issue of whether the law requires creators of works subject to design patent and copyright protection to elect one or the other realm of protection for their works from the institutional question of where such a requirement shall be enforced. The

⁷⁶ In cases where a copyright registration is secured before a design patent is issued, it would be the responsibility of the defendant in the copyright infringement action to raise the argument that copyright was lost as a result of issuance of the patent.

Copyright Office policy injects that Office into an enforcement role with respect to the election doctrine. There are alternatives, entailing greater passivity by the Copyright Office (and the Patent and Trademark Office), confining the question of reconciling design patent and copyright to the courts.

Courts have not yet confronted the need to consider whether and, if so, to what extent, a copyright may be exercised and enforced after the design patent in the same subject matter has expired. Courts have not yet had to confront the question of whether and, if so, how the coexistence of a design patent and a copyright affects available remedies against a tortfeasor. Courts have not yet even considered the precise contours of "overlap" between design patent and copyright: does it apply broadly to classes of works? Does it apply to particular aspects of a work protectible only under copyright, even though the work as a whole is principally protectible only under design patent? The combinations and permutations of these sorts of questions are limited only by the imagination of the bar.

The important point remains that the present case law and practices of the Copyright Office represent only partial efforts to rationalize the design patent/copyright interrelationship. Successful harmonization of the two systems ultimately will require the kind of clear policy directions that only the legislature can provide through clearly and carefully drawn legislation.

10. Copyright Office Conclusions.

The Copyright Office has studied extensively the issues associated with protecting the same subject matter under both the copyright law and the design patent statute. Cases on the issue are scant, but all except one have

rejected dual protection as unwise public policy. The Copyright Office has followed the holdings that copyright protection should not survive the issuance of a patent on the same subject matter.

Existing Copyright Office regulations, first issued in 1956, exclude the registration of drawings or designs covered by an issued design patent. In cases where the copyright claim is only the subject of a pending patent application, the Copyright Office will make the registration since, at the time of the copyright application, an arguably valid copyright claim exists,⁷⁷ and the patent may not issue.

According to our best estimates, no more than ten works of visual art have been rejected over the past year as a result of our election policy. The Copyright Office estimates that the total number of works refused registration under the Copyright Act of 1976 because of election of patent protection does not exceed twenty-five. Under the Copyright Act of 1909, of course, copyright protection was relinquished when a design or drawing was published in the Official Gazette because the Patent and Trademark Office practice in force at the time required removal of the copyright notice prior to such publication.

It is, of course, possible to disagree with the public policy of the Copyright Office's regulation. The Patent and Trademark Office has

⁷⁷ It can be argued that the mere filing of a patent application on subject matter covered by copyright divests copyright protection. The language of Korzybski supports such a construction. However, in the case of a patent application which is ultimately rejected, some courts might view it overly harsh to divest copyright in a meritorious work merely because the owner miscalculated on his chances of securing patent protection. For this reason, the Copyright Office has adopted a policy of not refusing registration until the patent is actually issued.

reached a contrary conclusion regarding patent issuance for copyrighted designs of useful articles.

Rejected copyright claimants have the opportunity under section 411(a) of the Copyright Act of 1976 to assert the argument in favor of dual protection. It seems appropriate for claimants asserting dual protection to carry the burden of proof that their dual protection is in the public interest.

In conclusion, the Copyright Office adheres to its policy of refusing to register claims where design patent protection already exists in the same subject matter, unless the Congress or the courts make clear that the Copyright Act of 1976 allows dual protection of the same design.

B. U.S. PATENT AND TRADEMARK OFFICE POLICY ON ELECTION ⁷⁸

The U.S. Patent and Trademark Office cannot require election between design patent protection and copyright protection.

Prior to 1974, the U.S. Patent and Trademark Office applied the election of protection doctrine. However, since 1974, the Office has followed the decision of the Court of Customs and Patent Appeals in In re Yardley. ⁷⁹ In this case the Court found that there is an area of overlap between copyright and design patent statutes where an author-inventor can secure both a copyright and design patent, and the author-inventor may not be required to elect between securing a copyright or a design patent. ⁸⁰

⁷⁸ The following are the views of the U.S. Patent and Trademark Office, and, as such, do not necessarily reflect the views of the Copyright Office.

⁷⁹ In re Yardley, 493 F.2d 1389, 181 U.S.P.Q. 331 (CCPA 1974).

⁸⁰ Id., 181 U.S.P.Q. at 334.

In Yardley, the Patent and Trademark Office Board of Appeals affirmed the examiner's rejection of a design patent application for a watch having a pictorial representation of Spiro Agnew on its face. The two grounds for rejection were: (1) obviousness under 35 U.S.C. §103, and (2) estoppel in view of prior copyright registration. The rejection was reversed on both grounds.

In deciding Yardley, the court noted that In re Blood⁸¹ and Ex parte Guild⁸² directly supported the Patent and Trademark Office Board of Appeals' decision upholding the examiner's rejection based on the election of protection doctrine. Tracing back in time, the court found that Ex parte Guild cites and relies on In re Blood, and In re Blood, in turn, cites and relies on Louis De Jonge.⁸³ In Louis De Jonge, the only issue was one of copyright validity and no design patent had been secured. Hence, the Yardley court said, the statements in Louis De Jonge regarding a mandatory election of protection were dicta. The court went on to say that it did not see any positive legal authority supporting this view.⁸⁴

In the Penthouse⁸⁵ case, the Court of Customs and Patent Appeals again noted that copyright, patent, and trademark laws stem from different

⁸¹ In re Blood, 23 F.2d 772 (D.C. Cir. 1927).

⁸² Ex parte Guild, 98 U.S.P.Q. 464 (Pat. Off. Bd. App. 1952), aff'd on other grounds, In re Guild, 204 F.2d 700, 98 U.S.P.Q. 68 (CCPA 1953).

⁸³ Louis De Jonge & Co. v. Breuker & Kessler Co., 182 F. 150 (C.C.S.E.D. Pa. 1910) aff'd on other grounds, 191 F. 35 (3d Cir. 1911), aff'd 235 U.S. 33 (1914).

⁸⁴ In re Yardley, 181 U.S.P.Q. at 335.

⁸⁵ In re Penthouse International Ltd., 565 F.2d 679, 195 U.S.P.Q. 698 (CCPA 1977).

concepts and offer different kinds of protection, which are not mutually exclusive. ⁸⁶

Where a design meets the criteria for both design patent and copyright protection, the Patent and Trademark Office believes that both should remain available to the designer and no election should be required. This is especially important in an infringement action where there is copying and the patent is held invalid, because copyright protection can be relied upon as a backstop. Likewise, where the copyright is not enforceable or copying cannot be proved, the design patent can be relied upon.

In a 1929 case, Korzybski, ⁸⁷ the Second Circuit held that when Korzybski filed his application and received his design patent, he made a full disclosure of his invention and dedicated it to the public, save for the right to make, use, and sell it during the patent term. It should be noted that the Patent and Trademark Office made this very argument in the Yardley case where the copyright had already been issued. The Office argued that a design patent could not be issued because, when the patent expires the monopoly created by it also expires and the right to make the article--including the right to make it in precisely the shape it carried when patented--passes to the public. The Court in Yardley said, that the mere fact that the copyright will persist beyond the term of any design patent which may be granted does not provide a sound basis for rejecting a design patent application. ⁸⁸

⁸⁶ Id., 195 U.S.P.Q. at 701, n3.

⁸⁷ Korzybski v. Underwood & Underwood, 36 F.2d 727 (2d Cir. 1929).

⁸⁸ In re Yardley, 181 U.S.P.Q. at 335.

IV. COMPUTER PROGRAMS AND USER INTERFACES

A. PATENT AND TRADEMARK OFFICE PRACTICE ON "USER INTERFACES." ⁸⁹

The term "user interfaces" is a term of art used in the computer industry that can be used broadly to mean any computer screen display or technique such as scrolling or windows. In some definitions, it may also include hardware devices. The use of the term, however, is commonly limited to the following six types of interfaces: ⁹⁰

- o Commands -- For example, "Press any key to continue" or "Type EXIT to return to DOS.",
- o Menus -- A list of choices are presented on the screen and the user chooses one that will enable him or her to perform a desired task or obtain desired information.
- o Questions and Answers -- For example, "Format another disk?" where the user types Y for "yes" and N for "no."
- o Form Filling -- For example, the Patent and Trademark Office's T-SEARCH requires the user to select a data base for searching, and then to indicate whether the search is to be for a registration or serial number, a design mark or a word mark. There are several other possibilities by which the user can tailor the search.

⁸⁹ The following are the views of the U.S. Patent and Trademark Office, and, as such, do not necessarily reflect the views of the Copyright Office.

⁹⁰ V. Douglas Hines, Office Automation, §8.3 (1985).

All of which are carried out by the user filling in the required information on the form presented on the screen.

- o Icons -- These are pictures which represent a function. For example, a picture of a file cabinet, when chosen by the user, will enable the user to store data. In addition, groups of icons and other indicators are often used together on a screen display. These groups are referred to as "Graphical User Interfaces." For purposes of this portion of the study, the term "icon" will refer to both.
- o Function Keys -- These are the F1 to usually F10 or F12 keys on the keyboard. Their function is controlled by the program being used. For example, in the WordPerfect word processing program, the unshifted F1 key is used to cancel a prior command. However, in the Lexis online information service, the unshifted F1 will display the next page of the document the user is viewing.

The design of user interfaces requires a disciplined, iterative and empirical approach to the study of human performance in the use of interactive systems. ⁹¹ Interfaces that are easy to use will have a competitive edge, and, therefore, there is a great deal of interest in protecting them.

The mere display on a screen of commands, menus, questions and

⁹¹ Ben Schneiderman, Designing the User Interface: Strategies for Effective Human Computer Interaction, page vi (1987).

answers, forms, or icons is not generally considered patentable subject matter for utility patents. It is generally considered to be merely printed matter.⁹² Furthermore, it is difficult to assert the claim that design patent protection is available for commands, menus, questions and answers, and forms because they would lack the statutory requirement for ornamentality.⁹³

Icons, however, may not be subject to design patent protection in the future depending on the outcome of appeals pending before the Board of Patent Appeals and Interferences. The U.S. Patent and Trademark Office has issued 21 design patents for icons. Subsequently, questions have been raised as to whether or not icons were statutory subject matter for design patents. The Office prefers to have judicial guidance on this matter. Cases in which design patent protection has been denied by the examiner have been appealed to the Board of Patent Appeals and Interferences. The Office is awaiting the outcome of the cases.

A program that would be executed by a computer to create any of these types of screen displays is not statutory subject matter. Specifically, it could be deemed to be merely a claimed invention consisting of mental steps, or merely consisting of printed matter. Also, a claimed invention that solely consists of a program listing may be rejected under section 112 of title 35, United States Code, as not "particularly pointing out and

⁹² Manual of Patent Examining Procedure, §706.03(b), "Printed Matter," p. 700-14.

⁹³ Manual of Patent Examining Procedure, §1504, "Improper Subject Matter Under 35 U.S.C. 171," pp. 1500-7.

distinctly claiming the subject matter which the applicant regards as his invention."

Machines or manufactures used to generate displays are statutory subject matter. As such, circuits or other hardware used to create displays could be statutory subject matter. Furthermore, the fact that an apparatus--even one consisting of digital computing elements--operates according to an algorithm does not mean it is necessarily excluded from statutory subject matter.⁹⁴ In other words, a claim drawn to an apparatus is patentable subject matter if it meets the tests for algorithms set forth by the courts.

Processes used to create displays may be statutory subject matter if they are not mathematical algorithms or scientific principles or if they are not otherwise nonstatutory subject matter. As described in Appendix B entitled "Patentable Subject Matter: Mathematical Algorithms and Computer Programs," the Office will use the tests developed by the courts to determine if these processes are statutory subject matter.

The U.S. Patent and Trademark Office does not "sort" or "classify" technology using the six categories of "user interfaces" identified in this section. Consequently, the Office cannot supply any statistics covering patents issued in these categories. However, patents have been issued on many types of processes for presenting or displaying information to users of computers. These include processes relating to scrolling, menus, windows, and icons. Also, patents have been issued on processes to merge, rotate, translate, and scale information as well as processes for generating graphs, shapes, and text.

⁹⁴ In re Iwahashi, 888 F.2d 1370, 12 U.S.P.Q.2d 1908 (Fed Cir. 1989).

As to function keys, the structure of the key and any related hardware may be patentable subject matter, or the process initiated by activating the key may be statutory subject matter if it is not a mathematical algorithm or scientific principle.

B. COPYRIGHT OFFICE PRACTICES ON COMPUTER PROGRAMS AND USER INTERFACES ⁹⁵

In this section, we report on Copyright Office registration practices regarding computer programs and screen displays. Copyright covers the expression of ideas --not the ideas themselves. ⁹⁶ Despite this statutory restraint, there is the perception among some commentators at least, that copyright is inexorably moving in that direction with respect to computer programs. ⁹⁷

The Subcommittee held extensive oversight hearings on the subject of computers and intellectual property in March 1990. As background, the Office of Technology Assessment ("OTA") prepared a paper that analyzed the policy issues involved in this area. ⁹⁸ The Copyright Office and the U.S.

⁹⁵ The following are the views of the Copyright Office, and, as such, do not necessarily reflect the views of the U.S. Patent and Trademark Office.

⁹⁶ 17 U.S.C. Sec. 102(b).

⁹⁷ See, U.S. Congress, Office of Technology Assessment, Computer Software and Intellectual Property: Background Paper 2 (and accompanying notes), March 1990. The Office of Technology Assessment is preparing an extensive study on software and intellectual property, Staying On Top: The Challenges Of Technological Change and Global Competition In Protecting Intellectual Property, scheduled for completion in October, 1991. OTA Project Proposal, April 1990.

⁹⁸ The Office of Technology Assessment, "Computer Software & Intellectual Property," March, 1990. In its background paper, the OTA noted four major reasons for the current uneasiness among scholars and technicians regarding the level of protection software is receiving.

(continued...)

Patent and Trademark Office also testified at the oversight hearings. In the course of the Copyright Office statement, the Register traced the development of copyright in computer programs from the registration of the first computer program in the Copyright Office through the judicial protection given in some courts to the "look and feel" of structure, sequence, and organization to the current controversy surrounding the extent of protection in textual screen displays. ⁹⁹

We review the beginning of computer program registration in the Copyright Office and discuss the report and recommendations of the National Commission on New Technological Uses ¹⁰⁰ (CONTU) convened, among other

⁹⁸(...continued)

First, software does not fit into the traditional copyright framework, since it is a mix of expression and utilitarian function. Second, OTA observes, technology is changing rapidly; therefore it is difficult to assess the nature of the original work for purposes of deciding what authorship is to be protected. The onset of expert systems may make it less and less likely that those administering the laws can rely on any particular type of code or any specific style of programming. It is said that artificial intelligence systems rely on "neural nets," not standard code. It is difficult to distinguish between the data on which a program operates and the program. Expert systems rely on a knowledge base that is a set of rules and logic itself. Neither copyright nor patent protects algorithms and facts. This new generation of software blurs the distinction between data and programs.

Third, OTA finds that key terms are not defined consistently, so it is hard for a copyright or patent examiner to know what a technician or programmer means when he or she describes the claim.

Most importantly, although the United States is in first place in software development, our European and Japanese trading partners are quickly narrowing the gap. The European single market exercise in 1992 will have a particularly competitive impact on U.S. software development. In the interest of maintaining American preeminence, the United States should strive to secure high-level software protection abroad and encourage harmonization of computer program protection among foreign countries, and in international laws and treaty obligations.

⁹⁹ Computers and Intellectual Property: Hearings Before the Subcommittee on Courts, Intellectual Property, and the Administration of Justice of the House Committee on the Judiciary, 101st Cong., 2d Sess. 254-324 (1990).

¹⁰⁰ P.L. 93-573, Dec. 31, 1974 (the law creating CONTU).

purposes, to study the issue of whether computer programs were appropriately protected in intellectual property rights. Next, we consider how the law regarding computer program screen displays protects such works and describe copyright registration practices regarding computer programs, their forms of expression, and their various component parts, including screen displays. Finally, we examine the areas of "overlap" between copyright and patent protection, from the perspective of the Copyright Office.

1. Registration under the 1909 Act.

The Office began registering computer programs under the 1909 Copyright Act. The first registration for a computer program was made in 1964 by John Banzhaf, a law student, who submitted a computer tape on a reel. There was some question about whether this form of the work constituted a "writing," and hence whether it was a constitutionally protected "writing of an author." Also, the Office questioned which class computer programs should be registered in. However, under the Office's "rule of doubt" ¹⁰¹ the program was registered as a "book." By 1965, the Office had published a procedure calling for deposit copies to be submitted in a form intelligible to human beings. As was true for all other "books," programs had to be published and had to contain the required amount of original authorship. ¹⁰² Under these conditions, the Office registered some 2,000 computer programs under the 1909 Act.

¹⁰¹ The Copyright Office will register a claim if there is a reasonable doubt about the ultimate action which might be taken under the same circumstances by an appropriate court with respect to whether the material deposited for registration constitutes copyrightable subject matter or the other legal and formal requirements of the statute have been met. Compendium II, Section 108.07.

¹⁰² Copyright Office Circular 31D (January 1965).

Although courts have generally accepted new classes of works that the Office has found registrable ¹⁰³ even in the absence of a statutory listing, the court in Data Cash System, Inc. v. JS & A Group, ¹⁰⁴ under the doctrine of White Smith v. Apollo Co., ¹⁰⁵ found that the 1909 Act required human intelligibility to constitute a copy, and thus comprise a protectible writing.

2. National Commission On New Technological Uses.

In the early 1970s, in order not to delay the passage of the omnibus revision bill, Congress referred several questions relating to computer programs and databases to the National Commission on New Technological Uses (CONTU), established, inter alia, for this purpose. While CONTU deliberated, Congress "froze" the law as it stood on the day before the 1976 Act became effective. ¹⁰⁶ As the revision bill progressed, it did not follow the White-Smith doctrine. Instead the 1976 Act provided that copyright inhered in original works of authorship fixed in any tangible medium of expression ¹⁰⁷ and that such works could encompass such "new forms of creative expression" as computer programs. ¹⁰⁸

¹⁰³ Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53 (1884); Goldstein v. California, 412 U.S. 546 (1973).

¹⁰⁴ 480 F.Supp. 1063 (N.D.Ill. 1979) aff'd on other grounds, 628 F.2d 1037 (7th Cir. 1980).

¹⁰⁵ White-Smith Music Co. v. Apollo Co., 209 U.S. 1 (1908), held that a phonorecording was not a "copy" of the music recorded thereon. The result of this case was partially overruled by the 1976 Act to the effect that under this law both "copies" and "phonorecords" are considered to be material embodiments of works of authorship.

¹⁰⁶ 17 U.S.C. Sec. 117 (1976).

¹⁰⁷ 17 U.S.C. 102(a) (1976).

¹⁰⁸ H.R. 1476, 94th Cong., 2d Sess. 54 (1976).

For the CONTU panel of fourteen commission members, Congress selected representatives from three groups: authors and other copyright owners, users of copyrighted works, and representatives of the general public, such as consumer protection organizations. In addition, the Register of Copyrights and the Librarian of Congress were ex-officio members. While none of the commissioners were computer programmers, the staff included at least two computer experts. The Commission held over twenty-three meetings and produced a final report. ¹⁰⁹

CONTU determined that copyright protection was appropriate for computer programs. In its analysis, CONTU set out the boundaries applicable to traditional works of authorship--that the work constitute an "original work of authorship." CONTU noted that programs, like other literary works, were subject to being considered uncopyrightable (1) if they appeared to constitute an insufficient amount of intellectual labor, and (2) if the expression were coterminous with the idea. ¹¹⁰ Moreover, CONTU made clear that it was the "tangible medium of expression but not the electro-mechanical functioning of a machine" that was protected by copyright. ¹¹¹

¹⁰⁹ Final Report of the National Commission on New Technological Uses of Copyrighted Works (Library of Congress; Washington, D.C. 1979) (hereafter: "CONTU Report"). See also Industrial Innovation and Patent and Copyright Law Amendments: Hearings on H.R. 6934 before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the House Committee on the Judiciary, 96th Cong., 2d Sess. (1980).

¹¹⁰ CONTU Report, at 18-20.

¹¹¹ CONTU Report, at 20.

As part of its final report CONTU recommended that Congress take three actions. The copyright law should:

1. make explicit that computer programs are proper subject matter of copyright;
2. extend copyright protection to all computer uses; and
3. ensure that rightful possessors can use or adapt their own copies for their use.

Pursuant to these recommendations, the Computer Software Protection Act of 1980 defined computer programs, in section 10(a) of Pub.L. 96-517, as a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result. ¹¹²

To bring the scope of computer programs into consonance with other categories of works, Congress also "unfroze" section 117, which had formerly provided no greater or lesser rights than did the 1909 Act. Section 117 now provides that an owner of a copy of a computer program may make an archival copy, copy or adapt the work as an essential step in using the program in a machine.

Although the Subcommittee that CONTU designated to determine the copyrightability of computer programs ¹¹³ unanimously favored the protection

¹¹² Act of December 12, 1980, Pub.L. 96-517, 94 Stat. 3015, 3028 (codified and amended at 17 U.S.C. §101 (1980)).

¹¹³ CONTU's charter included other issues that were at least of equal importance to the Commission, particularly the reproduction of copyrighted works, i.e. photocopying. The formal charge was "to study and compile data and make recommendations on legislation or procedures concerning (1) the reproduction and use of copyright works of authorship (A) in conjunction with automatic systems capable of storing, processing, retrieving, and transferring information, and (B) by various forms of machine reproduction, not including reproduction by or at the request of instructors for use in face-to-face teaching activities; and (2) the creation of new works by the application or intervention of such automatic systems of machine reproduction."

of computer programs under copyright law, the Commission as a whole was not unanimous. ¹¹⁴ A dissenter in the minority, John Hersey, argued that the utilitarian nature of computer programs bars copyrightability, ¹¹⁵ and that the copyright law required disclosure, at least under the 1909 law, and that the 75 year term of protection was too long. ¹¹⁶ Also, there being no substantial computer piracy reported as of that time, Hersey did not agree with the rest of the Committee that computer programs needed additional protection, siding instead with the same view expressed at the time by the World Intellectual Property Organization (WIPO). ¹¹⁷ On the whole, these arguments were not persuasive to the majority during CONTU's deliberations.

From time to time, however, these arguments resurface. ¹¹⁸ Recently they have been asserted with new force by commentators and technical experts. ¹¹⁹ Others simply acknowledge that copyright protection has evolved

¹¹⁴ Two of the 13 voting Commissioners, John Hersey and Rhoda Karpatkin, dissented from the recommendation that computer programs be protected by copyright without limitation. Commissioner Nimmer's reservations took the form of a concurring opinion.

¹¹⁵ CONTU Report, at 27-28.

¹¹⁶ Id. at 34.

¹¹⁷ Id. at 30. See WIPO Model Provisions on the Protection of Computer Software, 1978.

¹¹⁸ See e.g., Samuelson, CONTU Revisited: The Case Against Copyright Protection For Computer Programs In Machine-Readable Form, 1984 Duke L. J. 663 (1984); Brown, The Incompatibility of Copyright and Computer Software: An Economic Evaluation of a Proposal for A Market Place Solution, 66 N.C. L. Rev. 977, 1015 (1988).

¹¹⁹ See e.g., Experts Fear That Companies Misuse Patent, Copyright Protection Laws, PC Week, May 1, 1989 at 67; Samuelson, Why the Look and Feel of Software User Interfaces Should Not Be Protected By Copyright Law, Communications of the Association for Computing Machinery, Inc., Vol. 32, No. 5, (May, 1989) at 563; G. Davis, Airing Both Sides of the Look and Feel Debate, Computerworld, Aug. 13, 1990, at 21.

beyond traditional artistic works. The enormous investment of capital required to develop software makes it a U.S. imperative to provide strong copyright protection to software for exploitation in world markets. ¹²⁰

The most recent software amendment further restricts the "first sale" doctrine, ¹²¹ by requiring owners of copies other than nonprofit libraries and educational institutions to be authorized by the copyright owner to sell or lease any computer program. ¹²²

3. Copyright Registration Practices.

a. Administrative operations. The Copyright Office, pursuant to Section 702, promulgates regulations covering registration of original works of authorship. The Office has also developed a manual of examining practices for the use of its professional staff in making determinations regarding copyright registration--the Compendium of Copyright Office Practices I (1973) and II (1984). Compendium II contains Office interpretation and practices concerning the Copyright Act and the regulations promulgated to carry out that Act. Applications for copyright are intended to be prosecuted by lay persons.

To facilitate registration, the Office makes registration practices widely available so that the public and the courts may have an impartial and objective account of what the Office does. In addition to making the Compendium generally available, the Office publishes information circulars on

¹²⁰ See Copyright Protection of Computer Program Object Code, 96 Harv. L. Rev. 1723, 1741 (1983).

¹²¹ 17 U.S.C. Sec. 109 provides that, in general, an owner of a copy or phonorecord of a work may dispose of it as he wishes.

¹²² Pub. L. No. 101-650, 104 Stat. 5089, (Dec. 1, 1990). Unless extended, the rental portion of this Act terminates in 1997.

general copyright topics and on different categories of works, e.g., Copyright Registration for Computer Programs. ¹²³ The Office has also developed specific examining practices for particular categories of material, e.g., Computer Screen Display Practices. ¹²⁴

b. Copyright registration for computer programs. Ordinarily registration of computer programs is accomplished by submitting appropriate application forms and identifying portions of the program reproduced in visually perceptible form, either on paper or in microform, in source code ¹²⁵ format. ¹²⁶ Computer programs are judged registrable or not based on whether they contain the necessary minimum amount of original authorship in the form of statements or instructions.

Since the Office is unable to examine programs in their machine readable form, regulations announced that the appropriate deposit is "identifying material"-- the first and last 25 pages of source code. A printout of the entire program is also satisfactory; however, most depositors choose to submit identifying material for examining purposes. ¹²⁷

¹²³ Copyright Office Circular 61, Copyright Registration for Computer Programs (hereinafter Cir. 61).

¹²⁴ Copyright Office Computer Screen Display Practices, unpublished, September, 1989. (Hereafter Screen Display Practices).

¹²⁵ Source code is the computer program code as the programmer writes it, using a particular programming language, generally a high-level language such as BASIC, COBOL, or FORTRAN.

¹²⁶ See generally COMPENDIUM II, COMPENDIUM OF COPYRIGHT OFFICE PRACTICES, Chapter 300, Sections 320 nn.(1984).

¹²⁷ Cir. 61.

While the Copyright Office considers source code the optimum representation of copyrightable authorship in a computer program, it will also register the object code format under the rule of doubt if the applicant confirms in writing that the work as deposited contains copyrightable material. Source code, the human readable format, is preferable to object code, the machine language format (ordinarily binary, octal, or hexadecimal code) which the computer executes.

The Copyright Office has made special arrangements for the deposit of computer programs that contain trade secrets. If applicants are unwilling to disclose confidential material, they may deposit optional forms of code. ¹²⁸

The Office distributes materials to the public to provide information on registrations; the Office seeks to make clear that while copyright protection extends to all of the copyrightable expression embodied in a computer program, copyright is not available for ideas, program logic, algorithms, systems, methods, concepts, or layouts. ¹²⁹ Applicants register claims in the Copyright Office rather than being issued a copyright, since copyright is automatic upon creation. ¹³⁰ Copyright owners may voluntarily register their claims to obtain valuable benefits afforded by the copyright statute. ¹³¹ If the legal and statutory requirements appear to be met, ¹³²

¹²⁸ See 37 C.F.R. 202.20 (c)(2)(vii)(A)(2) (1989) describing available deposit options.

¹²⁹ Cir. 61, p.2.

¹³⁰ 17 U.S.C. §302(a), (1976).

¹³¹ 17 U.S.C. §§408, 412 (1976).

¹³² 17 U.S.C. §410(a).

the Office accepts the statements made by the applicant as true and enters the claim in its public record, unless the registration materials present questions.

One of the certified averments that the applicant makes as part of the application for registration is a brief general statement that forms the basis of the copyright claim. The Office suggests that such statements of computer program authorship be fairly standard and nonambiguous. The Office does not register claims in design,¹³³ physical form, hardware, or algorithms, nor in a program's features or functions.

Derivative computer programs are also registrable in the Copyright Office if they contain substantial revisions, augmentations, abridgements, or other modifications, so that as a whole the modified version contains a sufficient minimum amount of original authorship.

To register a claim in a computer program that is a derivative work, the applicant should disclaim matter that has been previously registered in the Copyright Office, or previously published, including public domain material (e.g. subroutines, modules, or textual images), so that the public record will show the nature of the copyright owner's "new" work that makes the derivative work eligible for new copyright protection. In all cases, material that was never subject to registration need not be referred to in the process of making application for copyright registration. The deposit that accompanies the claims for registration must show a sufficient amount of authorship, in the form of visibly perceptible human-readable

¹³³ Beginning Dec. 1, 1990, under the Architectural Works Copyright Protection Act, the design of a building fixed in tangible form became protected by copyright. Pub.L. 101-650, 104 Stat. 5089, 5133 (1990).

authorship to support the presumption that the work constitutes an original work of authorship. Computer programs containing trade secrets may fulfill special deposit requirements, but the deposit objective is to ascertain whether sufficient copyrightable content is present while at the same time maintaining the applicant's trade secret. Where insufficient material is submitted for the Office to make a determination, the Office will issue a registration under its rule of doubt and warn that it has not determined the existence of copyrightable authorship.

The Office registers claims in automated databases, a body of facts, data, or other information assembled into an organized format suitable for use in a computer, ¹³⁴ both in their original and revised form, if the work as a whole constitutes an original work of authorship. ¹³⁵ Ordinarily data bases are registered as compilations. If the data is primarily previously published or registered material or if the data is in the public domain, the claim is limited to the compilation authorship. If new material has been added, the claim could include the additional or revised literary or other material in addition to the compilation authorship.

The Copyright Office registers claims in works of authorship related to computer programs. Registration of claims, for instance, may be

¹³⁴ The copyright law does not specifically enumerate databases as copyrightable subject matter, but the legislative history indicates that Congress considered computer databases and compilations of data as "literary works" subject to copyright protection. Databases may be considered copyrightable as a form of compilation, which is defined in the law as a work "formed by the collection and assembling of preexisting materials or of data that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship." Copyright Office Circular 65, p.2.

¹³⁵ Feist Publications, Inc. v. Rural Telephone Service Company, Inc., 499 U.S. _____, 59 U.S.L.W. 4251 (Mar. 27, 1991).

made for instructional booklets, flowcharts, and other material related to the development or explanation of the computer program.

The Copyright Office registered 12,604 computer related works over the most recent twelve month period for which we have registration totals. We estimate that around one tenth of this number includes screen display claims, with the great majority of these containing textual material, rather than pictorial icons or other visual authorship in addition to literary material. The number of audiovisual screen displays registered over the most recent twelve months is 84, with the great majority of those claims constituting videogames. Registrations of primarily or entirely visual arts screen displays unaccompanied by a computer program averages ten per year, with a significant increase over the last six months. See App. D.

c. Copyright registration practices for screen displays.

(1) Audiovisual works. The Office will register copyrightable material fixed in an audiovisual work ¹³⁶, such as a video game. The work must contain related images that are works of the visual arts, that is, computer-generated photographs, pictures, or drawings, whether accompanied by audio authorship or not. If the work of authorship is textual, regardless of whether the text generated is displayed on a computer screen, the work of authorship is not considered an audiovisual work for copyright registration purposes.

¹³⁶ An audiovisual work is defined as a series of related images intended to be shown by the use of machines or devices, such as projectors, viewers, or electronic equipment together with any accompanying sounds. ¹⁷ U.S.C. Sec. 101 (1976).

(2) Copyright registration for textual screen displays.

The questions that arise regarding computer screen displays concern the extent to which certain registrations of original works of authorship cover discrete components of these works.

The following section discusses the practices of the Copyright Office regarding registration of computer screen displays, the standards the Copyright Office applies to determine copyrightable authorship, and the practices the Copyright Office applies when the claim to copyright purports to cover the entire work.

(a) Unitary Registration Practice. In 1988, following a public hearing ¹³⁷ and opportunity for written comment, the Office issued a registration policy decision ¹³⁸ requiring that all copyrightable expression embodied in a computer program owned by the same claimant, including computer screen displays, be registered on a single application. ¹³⁹ The Office had considered whether or not multiple registrations of the same work should be allowed at the time of revision of the Copyright Act, but had decided against it. ¹⁴⁰ In considering the question anew, the Office concluded that a fundamental underlying objective was to establish a clear, accurate, easily understandable public record and to exclude from that record unjustified or

¹³⁷ Notice of Public Hearing; Registration and Deposit of Computer Screen Displays; Public Hearing. 52 Fed. Reg. 28311-28312 (1987).

¹³⁸ Notice of Policy Decision, Registration Decision; Registration and Deposit of Computer Screen Displays, 53 Fed. Reg. 21817-21820, (1988).

¹³⁹ Prior to this hearing some applicants were seeking separate registrations for different parts of the same computer program.

¹⁴⁰ Interim Regulation, Registration of Claims to Copyright, 43 Fed. Reg. 965-67, (1978).

otherwise insufficient claims resulting from multiple registrations of parts of works. ¹⁴¹ The Office noted further that "subdividing claims might also result in multiple infringement actions and multiple claims for statutory damages, based on separate registration." ¹⁴² It follows from the single rule that a registration for a computer program covers any copyrightable authorship in the screen displays, just as registration for a book covers all of the book's copyrightable components. Not all components of a work, of course, are separately copyrightable. The typeface of a book, for example, would not be covered by a registration.

In adhering uniformly to the single registration rule, the Office sought firmly to establish that single registration for the computer program would cover any copyrightable authorship in the screen displays.

(b) Menu Screens. Menu screens are integral parts of computer programs, and they may or may not contain copyrightable expression. In general, the Copyright Office does not address the copyrightability of particular components of a work, unless a claim is asserted or implied in a subpart. In that event, the Office examines the component to determine whether or not, in the context of the entire registration, the claim is justified.

Many computer applications programs enable an end user to manipulate material on a screen to accomplish certain results. In the course of going about various tasks, the user receives queries, prompts, and menus for accomplishing those tasks. Many of these individual displays may not be

¹⁴¹ 53 Fed. Reg. 21819.

¹⁴² Id.

copyrightable. However, if the form of expression on these screens is extensive and original, it may be subject to copyright, just as a chapter in a book, or even a page of text, might be subject to copyright if submitted separately. As we state in our circular on registration:

The registration will extend to any related copyrightable screens, regardless of whether identifying material for the screens is deposited. However, where identifying material for screen displays is deposited, it will be examined for copyrightability. Where the application refers specifically to screen displays, identifying material for the screens must be deposited. Where the screens are essentially not copyrightable (e.g. de minimis menu screens, blank forms, or the like), the application should not refer to screens and the deposited identifying material should not include screens. (Emphasis both added and in original). ¹⁴³

4. Standards Regarding Copyrightability.

a. The responsibility of the Register to determine copyrightability. The Register of Copyrights is directed to register or refuse to register each claim submitted for copyright based on examination of the claim and a determination of whether or not it constitutes copyrightable subject matter. In the course of registering nearly 700,000 claims annually, moreover, the Office has broad experience in determining copyrightability, and applies the "original work of authorship" standards set forth in the Compendium II.

The Register is responsible for determining copyrightability in the first instance. The Copyright Office examines works that are submitted for registration of claims to copyright pursuant to Sections 410(a) and (b)

¹⁴³ See Cir. 61 at 3.

of the law. Ultimately, the courts determine what is copyrightable, but the Office takes seriously its responsibility for determining copyrightability in the first instance, to assure efficient administration of the copyright law and to assist the courts in denying protection for unoriginal, uncreative works. In taking the position that registration for the computer program covers any copyrightable authorship contained in the computer program and the screen displays, regardless of whether identifying material for the screens is deposited, the Office does not intend to create the implication that all material displayed on the screens is copyrightable. To create a useful registration record of computer programs, the Office requires a statement of the basis of the claim in the form of a description of the authorship. ¹⁴⁴

b. General standards of copyrightability. In determining whether the basis of the claim is appropriate, the Office applies established standards of copyrightability. Although the 1976 revision substantially modified the copyright law, it did not change the standards of copyrightability. Copyright protects "original works of authorship." ¹⁴⁵ The legislative reports note:

The two fundamental criteria of copyright protection -- originality and fixation in tangible form -- are restated in the first sentence of this cornerstone provision. The phrase "original works of authorship," which is purposely left undefined, is intended to incorporate without change, the standard of originality established by the courts under the present [1909] copyright statute. . . .

¹⁴⁴ Copyright Office Application Form TX, Space 2. The "nature of authorship" portion of Space 2 requests that the applicant "briefly describe [the] nature of the material created by this author in which copyright is claimed."

¹⁴⁵ 17 U.S.C. 102(a).

Section 102 implies neither that that subject matter is unlimited nor that new forms of expression within that general area of subject matter would necessarily be unprotected. ¹⁴⁶ (Emphasis added).

These standards are set out in the Compendium. In order for a work to be the subject matter of copyright under the current law, it must be an original work of authorship. Quality, aesthetic merit, and ingenuity are not considered in determining the copyrightability of a work. In order to be an original work of "authorship," the work must contain at least a certain minimum amount of original creative expression. ¹⁴⁷

The law firmly establishes that ideas, processes, methods and systems are outside the scope of copyright protection. ¹⁴⁸ With respect to the nature of copyright and computer programs, Congress acknowledged:

Some concern has been expressed lest copyright in computer programs should extend protection to the methodology or processes adopted by the programmer, rather than merely to the "writing" expressing his ideas. Section 102(b) is intended, among other things, to make clear that the expression adopted by the programmer is the copyrightable element in a computer program, and that the actual processes or methods embodied in the program are not within the scope of the copyright law.

Section 102(b) in no way enlarges or contracts the scope of copyright protection under the present law. Its purpose is to restate, in the context of the new single Federal system of copyright, that the basic dichotomy between expression and idea remains unchanged. ¹⁴⁹

¹⁴⁶ H.R. Rep. No. 1476, 94th Cong., 2d Sess. 51 (1976) [hereafter 1976 House Report]; S. Rep. No. 473, 94th Cong., 1st Sess. 50-51 (1975).

¹⁴⁷ Compendium II of Copyright Office Practices [hereafter Compendium II], section 202.02.

¹⁴⁸ 17 U.S.C. 102(b).

¹⁴⁹ 1976 House Report at 57.

c. Application of general standards to computer screens. The Copyright Office applies the same standards of originality to all kinds of authorship submitted for registration. Like works in other categories that do not contain sufficient copyrightable material, literary works (including computer programs) submitted for registration that do not contain sufficient copyrightable authorship are denied registration.¹⁵⁰ Obviously, where a copyright claim is asserted in a particular subset of material within a larger unit of publication, the possibility for insufficient copyright authorship is even greater. With respect to machine-readable works, the complete work may not be deposited in the Office. Consequently, the Office may place more than usual reliance on the application for a description of the copyrightable content of a machine-readable work.

(1) Acceptable authorship claims. Where an applicant describes a claim in terms that may or may not represent copyrightable material, the Office requests removal of the questionable description to avoid a false representation to the public and the court that the Office has determined that the material so described does constitute copyrightable subject matter.¹⁵¹ Copyrightability of those questionable aspects will be determined by the court.

The Office encourages statements of authorship that clearly reflect copyrightable authorship. For example, the Office requests statements of authorship in well-settled copyrightable terms, and discourages the

¹⁵⁰ McIntyre v. Double-A Music Corp., 179 F. Supp. 160 (S.D. Cal. 1959); Bailie v. Fisher, 258 F. 2d 425 (D.C. Cir. 1958); Smith v. George E. Muehlebach Brewing Co., 140 F. Supp. 729 (W.D. Mo. 1956); E.H. Tate Co. v. Jiffy Enterprises, Inc., 16 F.R.D. 571 (E.D. Pa. 1954).

¹⁵¹ Compendium II, Sec. 619.06.

use of terms that are ambiguous or imply claims in uncopyrightable material. Terms such as "computer program," "entire text of computer program," and "entire program code" are encouraged, but terms such as "ideas," "program logic," "algorithms," "systems," "methods," "concepts," or "layout" are unacceptable. ¹⁵² Information distributed to the public states:

[T]he Copyright Office has consistently believed that a single registration is sufficient to protect the copyright in a computer program, including related screen displays, without a separate registration for screen displays or reference to the displays in the application. An application may give a general description in the "nature of authorship" space, such as "entire work" or "computer program." This description will cover any copyrightable authorship contained in the computer program and screen displays, regardless of whether identifying material for the screens is deposited. ¹⁵³

Where the applicant asserts a specific claim in material contained in screen displays, the applicant may add to the description of program authorship, e.g., "text of screen displays," "audiovisual material," or "artwork." The Office disallows descriptions such as "menu screens" "structure, sequence and organization," "layout," "format," or the like. The Office takes the position that such claims are unacceptable on an application for registration because some or all of this material may constitute uncopyrightable expression. ¹⁵⁴

¹⁵² Cir. 61, p.2; Screen Display Practices, pp. 6-8.

¹⁵³ Cir. 61, p.3.

¹⁵⁴ 17 U.S.C. 102(b).

(2) **Unacceptable authorship claims.** Screens designed primarily to record information, in the Copyright Office's examining experience, are typically not registrable because they are frequently analogous to blank forms, that is, they do not contain sufficient original expression to support a claim to copyright. Where those screens are submitted as separate works, the Office applies the same long-established examining practices used with blank forms. The pertinent regulation states that blank forms, such as time cards, graph paper, account books, report forms, order forms, and the like, which are designed for recording information and do not in themselves convey information, are not subject to copyright, and the Office cannot register such works.¹⁵⁵ This regulation has been upheld by the courts,¹⁵⁶ and was most recently affirmed in Safeguard Business Systems Inc. v. The Reynolds and Reynolds Co.,¹⁵⁷ and Bibbero Systems, Inc. v. Colwell Systems, Inc.¹⁵⁸ In Bibbero, defendant developed nearly identical medical "superbills" for use in obtaining reimbursement from insurance companies. The court found that:

[t]he purpose of plaintiff Bibbero's superbill is to record information. . . . The superbill is simply a blank form which gives doctors a convenient method for recording services performed. The fact that there is a great deal of printing on the face of the form--because there are many possible diagnoses and

¹⁵⁵ 37 C.F.R. 202.1(c)(1990).

¹⁵⁶ Baker v. Selden, 101 U.S. 99 (1879); Brown Instrument Co. v. Warner, 161 F. 2d 910 (D.C. Cir. 1947) cert. denied, 332 U.S. 801 (1947).

¹⁵⁷ 14 U.S.P.Q. 2d 1829 (E.D.Pa. 1990), aff'd mem. 919 F.2d 136 (1990).

¹⁵⁸ 893 F.2d 1104 (9th Cir. 1990).

treatments -- does not make the form any less blank. ¹⁵⁹

Forms that convey information may be protected; this includes screen displays of such forms, since screens are judged by traditional standards of copyrightability.

The Copyright Office does not register claims in ideas and functionally determined expression. In addition to the nonprotectibility of works containing insufficient authorship, copyright protection is denied to a form of expression that is determined by the idea it expresses.

The CONTU Report concludes:

...copyrighted language may be copied without infringing when there is but a limited number of ways to express a given idea. This rule is the logical extension of the fundamental principle that copyright cannot protect ideas. In the computer context, this means that when specific instructions, even though previously copyrighted, are the only and essential means of accomplishing a given task, their later use by another will not amount to an infringement.

¹⁶⁰

In Morrissey v. Procter & Gamble Co., ¹⁶¹ the court established the principle that where a work was so simple and so straightforward as to leave available only a limited number of forms of expression of the substance of the subject matter, the expression would be uncopyrightable. There the plaintiff had created a set of contest rules. Defendant had admittedly

¹⁵⁹ 893 F.2d, at 1107-8. In note 1, the court observes that the Copyright Office reaffirmed the validity of its blank form rule following reconsideration. See Notice of Termination of Inquiry Regarding Blank Forms. 45 Fed. Reg. 63297, 63299 (1980).

¹⁶⁰ CONTU Report, at 20 citing Continental Casualty Co. v. Beardsley, 253 F.2d 702, 706 (2d Cir. 1958).

¹⁶¹ 379 F.2d 675 (1st Cir. 1967).

copied them and acknowledged that there was more than one way of expressing the substance of the rules. Nevertheless, in holding the work uncopyrightable, the court reasoned that:

. . . to permit copyrighting would mean that a party or parties by copyrighting a mere handful of forms, could exhaust all possibilities of future use of the substance. In such circumstances it does not seem accurate to say that any particular form of expression comes from the subject matter. However, it is necessary to say that the subject matter would be appropriated by permitting the copyrighting of its expression. We cannot recognize copyright as a game of chess in which the public can be checkmated. ¹⁶²

Sketches and language used to instruct the purchasers of an article how to use it were held to be purely functional and not subject to copyright protection in E. H. Tate Company v. Jiffy Enterprises. ¹⁶³

The Office does not register claims in mere listings of ingredients. Such listings of ingredients or contents are not copyrightable because they are "forms of expression dictated solely by functional consideration." ¹⁶⁴ In Perma Greetings, Inc. v. Russ Berrie & Co., ¹⁶⁵ the court looked at mug-type coasters containing short familiar phrases and held them not subject to copyright stating that "phrases and expressions conveying an idea that is typically expressed in a limited number of stereotypic fashions

¹⁶² Id. at 678-79 citing Baker v. Selden.

¹⁶³ 16 F.R.D. at 573 (E.D. Pa. 1954).

¹⁶⁴ Consumers Union of U.S. v. Hobart, 199 F.Supp. 860 (S.D.N.Y. 1961); 1 NIMMER 201[B] at 2-14; 37 C.F.R. Sec. 202.1(a); Ashton-Tate Corp. v. Ross, 916 F.2d 516, 521-22; Surgical Supply Service Inc. v. Adler, 206 F.Supp. 564 (E.D.Pa. 1962); Kitchens of Sara Lee, Inc. v. Nifty Foods Corporation, 266 F.2d 541 (2d Cir. 1959).

¹⁶⁵ 598 F. Supp. 445, 448 (E.D. Mo. 1984).

are not subject to copyright protection." ¹⁶⁶ In Magic Marketing Inc. v. Mailing Services of Pittsburgh, Inc., ¹⁶⁷ the court held that envelopes with instructions printed on them were not copyrightable. In looking at the language on the envelope, the court noted that the listing of the contents of an envelope or package, like a listing of ingredients, is not protected under copyright regulations. ¹⁶⁸ The court held that instructions on the envelope that are "nothing more than a direction or instruction for use" ¹⁶⁹ are not protected. Furthermore, the court observed: "More complex directions, such as the serving directions on a frozen dessert package, are not copyrightable." ¹⁷⁰ In sum, the phrases printed on the envelopes are generic in nature and lack the minimal degree of creativity necessary for copyright protection." ¹⁷¹ In Ashton-Tate v. Ross, ¹⁷² the court held that a list of user commands that were incorporated as part of the user interface was not a copyrightable part of the computer program: "The list simply does not qualify for copyright protection." ¹⁷³

¹⁶⁶ Id. at 448, quoting Alexander v. Haley, 460 F. Supp. 40, 46 (S.D.N.Y. 1978).

¹⁶⁷ 634 F. Supp. 769 (W. D. Pa. 1986).

¹⁶⁸ 37 CFR Section 202.1(a).

¹⁶⁹ 634 F. Supp at 772.

¹⁷⁰ Citing to Kitchens of Sara Lee, Inc. v. Nifty Foods Corp. 266 F.2d 541 (2nd Cir. 1959).

¹⁷¹ 634 F. Supp. at 772.

¹⁷² 916 F.2d at 516 (9th Cir. 1990).

¹⁷³ Id. at 522.

On occasion, compilations of terms have been the basis of the copyright claim in minimal authorship displayed on a screen. In Feist Publications, Inc. v. Rural Telephone Service Co., Inc.,¹⁷⁴ the Supreme Court recently clarified the scope of copyright in mere listings by holding that an alphabetical listing of names and addresses in the white pages of a telephone directory is not a copyrightable compilation.¹⁷⁵ The Court certified the case because of disagreement among the circuits as to whether compilation authorship arose from an application of the so-called "sweat of the brow," or industrious collection doctrine, or arose from original creative expression. Further, the Court held compilations to the same standards of copyrightability applicable to all categories of original works of authorship, so that in order to be copyrightable "compilations of terms" must be the result of intellectual labor as opposed to being merely that of industrious effort.¹⁷⁶

The Court in Feist made it clear that mere alphabetical listings did not meet the statutory test and held "that a compilation is copyrightable only to the extent that it features an original selection, coordination, or arrangement."¹⁷⁷ It has long been argued that no selection can take place when all of a certain category of items has been included in a listing.

¹⁷⁴ 111 S. Ct. 1282 (1991).

¹⁷⁵ See also note 203 and accompanying text discussing Manufacturers Technologies, Inc. v. Cams, Inc., 706 F. Supp. 984 (D. Conn. 1989) and the potential effect of the Feist decision on copyrightability of compilations in the computer field.

¹⁷⁶ Id. 111 S. Ct. at 1292.

¹⁷⁷ Id. at 1295.

The Court also clarified that "originality" is the touchstone of copyrightability for compilations as a category of works. Originality, it held, mandates that some degree of creativity be present in order to qualify for copyright.

Justice O'Connor distinguished clearly between the act of compiling and the material that is compiled. The two had long been confused, with the result that some argued that their compilation copyrights provided some underlying degree of protection to the material compiled. In Feist, the material compiled was facts. Justice O'Connor, who delivered the opinion for the Court, explained that:

Even if a work qualifies as a copyrightable compilation, it receives only limited protection. This is the point of Section 103 of the Act. Section 103 explains that "[t]he subject matter of copyright . . . includes compilations," but that copyright protects only the author's original contributions--not the facts of information conveyed:

"The copyright in a compilation . . . extends only to the material contributed by the author of such work, as distinguished from the preexisting material employed in the work, and does not imply any exclusive right in the preexisting material." Sec. 103(b).¹⁷⁸

This landmark decision affirms that compilation authorship in itself does not give any rights in the facts, or data, or other public domain material that is compiled.

As Sec. 103 makes clear, copyright is not a tool by which a compilation author may keep others from using the facts of data he or she has collected. "The most important point here is one that is commonly misunderstood today: copyright . . . has no effect one way or the

¹⁷⁸ Id. at 1294-95.

other on the copyright or public domain status of the preexisting material." H.R.Rep., at 57; S.Rep., at 55. . . . [T]he facts contained in existing works may be freely copied because copyright protects only the elements that owe their origin to the compiler--the selection, coordination, and arrangement of facts. ¹⁷⁹

Justice O'Connor said that, where the creative spark was present in the compilation authorship, compilations would still be copyrightable. However, the database industry and others producing electronic compilations are concerned that they may no longer be able to assert copyright in the facts or other data when the compilation authorship is not appropriated. These copyright owners fear that the ease with which computers can rearrange facts and other lists of data means the Court has reduced the level of protection for electronic databases and other electronically generated lists.

(3) Claims in "Entire Work." The Copyright Office construes the description "entire work" on an application to encompass only copyrightable authorship. Copyright registration in a computer program, just as in other works, covers the entire copyrightable expression embodied in that program. Thus, flow charts, source codes, and object codes may all be protectible. ¹⁸⁰ As specified in our regulation and in Circular 61, screen displays may be protected to the extent they contain copyrightable authorship. If screen displays are mentioned on the application, they will be examined. Many registrants, however, claim copyright in the "entire work" without submitting a specific claim in the screen display.

¹⁷⁹ Id. at 1295.

¹⁸⁰ See CONTU Report at 21.

The Copyright Office will accept a claim in the "entire work" on the understanding that "entire work" refers only to the copyrightable content of the work of authorship. When the Office accepts a claim in the "entire work", neither the public nor the courts should assume that the Copyright Office has made a determination that all of the component parts of the work, taken individually, are necessarily entitled to copyright protection as original works of authorship.

The Office's registration standards do not vary from format to format. However, a particular medium, such as computer screen displays, may raise issues of whether expression is functionally determined, or limited by Morrissey v. Proctor & Gamble, ¹⁸¹ or blank form criteria. ¹⁸²

The Copyright Office does not knowingly register menu screens per se, on grounds that they are generally functionally determined. We do not advocate any diminished standard of original works of authorship to protect all elements of user interfaces.

5. General Overview Of Computer Program and Screen Display Decisions.

a. Computer Programs. The early computer program cases provided answers to four initial questions: what is a copy, for instance is a ROM (read only memory) device a copy; are operating systems programs copyrightable; is there a difference in the copyright protection available for object code as well as source code; is microcode protected by copyright.

The first major decision dealt with the definition of a copy: what form of embodiment was required for a work of authorship to be considered

¹⁸¹ 379 F.2d 675 (1st Cir. 1967).

¹⁸² 37 C.F.R. 202.1(c).

fixed in tangible form and thus subject to copyright protection. The initial answer by Data Cash v. JS&A,¹⁸³ in accordance with the 1909 Act, (object code not a copy) was ultimately reversed by the 1976 Act definition of a copy as a "material object from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."¹⁸⁴

Protection for operating systems was established in Apple Computer, Inc. v. Franklin Computer Corp.,¹⁸⁵ Since both operating systems programs and applications programs were sets of instructions to produce a certain result executed by the computer, each was potentially copyrightable.

That object code and source code were protectible under copyright was settled by a line of cases led by GCA Corp. v. Chance.¹⁸⁶ Additionally, Williams Electronics Inc. v. Artic International Inc.,¹⁸⁷ held that the fact that object code is not ordinarily readable by humans was no bar to copyrightability, but instead it falls squarely within the definition of "copies" and "fixation" in the 1976 Act.

NEC Corp. v. Intel Corp.,¹⁸⁸ finally, held that microcode is copyrightable if it conforms to the usual standards of fixation and originality. Thus, even though the nature of microcode's instructions is to tell

¹⁸³ 480 F.Supp. 1063 (N.D.Ill. 1979) aff'd on other grounds, 628 F.2d 1038 (7th Cir. 1980).

¹⁸⁴ 17 U.S.C. Sec. 101.

¹⁸⁵ 714 F.2d 1240 (3rd Cir. 1983).

¹⁸⁶ 217 U.S.P.Q. 718 (N.D.Cal. 1982).

¹⁸⁷ 685 F.2d 870 (3rd Cir. 1982).

¹⁸⁸ 10 U.S.P.Q.2d 1177 (N.D.Cal. 1989).

a microprocessor which of its thousands of transistors to activate in order to perform its assigned tasks, the microcode itself is copyrightable. The court rejected the argument that the microcode lacked originality because several microsequences were dictated by functional considerations that lacked even minimal creativity. The court said any work "be it a poem, novel or computer program, can be chopped into parts that could be said to have very few creative steps." 189

A line of cases unconnected with literal code, involving the protection of "structure, sequence and organization" 190 of business-related programs, has provoked much critical commentary. Departing from the finding of infringement based on verbatim or near-verbatim taking of copyrighted programs, the court in Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc. 191 introduced an approach of finding infringement through nonliteral copying. In the screen display context, the Broderbund Software, Inc. v. Unison World, Inc. court 192 followed the same approach, holding that plaintiff's menu screens, input formats, and sequencing of screens were protected.

189 Id. at 1178.

190 The Copyright Office registration practices do not permit claims in structure, sequence, and organization, on the theory that this term does not always denote copyrightable authorship.

191 797 F.2d 1222 (3rd Cir. 1986).

192 648 F.Supp. 1127 (N.D.Cal. 1986).

b. Screen displays. In Digital Communications Associations, Inc., v. Softklone Distributing Corp., ¹⁹³ the court held that copyright protection of a computer program did not extend to the screen display. However, as the plaintiff had registered its screen display separately, the court found that display registrable. In order to determine the copyrightability of Digital's screen display, the court engaged in an idea-expression inquiry. Judge O'Kelley found that "the 'idea' is the process or manner by which the status screen operates, and the 'expression' is the method by which the idea is communicated to the user." ¹⁹⁴ Specifically, the court held that because the parameter/command terms of Digital's 'Main Menu' "could have been arranged and delineated in an almost infinite number of horizontal and vertical patterns and groupings," ¹⁹⁵ the mode of expression was not an idea and therefore no merger took place. The court took note of registration of the work as a compilation and ruled that the status screen was a copyrightable compilation of parameter/command terms, ¹⁹⁶ and was therefore infringed by Softklone's Main Menu status screen.

The Softklone court followed the Whelan holding that file structure, sequence, and organization could be protected, and rejected defendant's argument that the status screen was an uncopyrightable "blank form," holding that the form "clearly expresses and conveys information." ¹⁹⁷

¹⁹³ 659 F.Supp. 449 (N.D. Ga. 1987).

¹⁹⁴ Id. at 458.

¹⁹⁵ Id. at 460.

¹⁹⁶ Id. at 463.

¹⁹⁷ Id. at 462.

Following this case, the Office discontinued its practice of making separate registration for screen displays apart from their computer programs--a practice begun to accommodate the separate pictorial and other visual authorship, along with any accompanying audio authorship in video games. Instead the Office reconfirmed the one registration per work rule of 37 C.F.R. 202.3 (b). The different kinds of authorship in one work are registered in the class of predominating authorship.

In Manufacturers Technologies, Inc., v. Cams, Inc.,¹⁹⁸ the court held that the plaintiff did not have to prove copyright of the program code to establish infringement, but that substantial similarity of the screen display would be sufficient to show copying. To do this, Judge Daly created a legal fiction to form two registrations from the single registration made from the screen displays together with the computer program. The court was persuaded to make this analysis because the screen display communicated with the user and the computer program communicated to the machine.¹⁹⁹

The defendant argued that "the screen displays are dictated by functional considerations which so limit the manner of expressing the idea of cost estimating that any expression of that idea is likely to be very similar, if not identical."²⁰⁰ The court disagreed with this argument and with defendant's other major contention, that the screen displays at issue were uncopyrightable forms necessary to the expression of an idea which conveyed no information to the user. The court found, out of at least 17

¹⁹⁸ 706 F.Supp. 984 (D. Conn. 1989).

¹⁹⁹ Id.

²⁰⁰ Id. at 993.

screens, that only the "Job Identification" screen was protectible. This screen consisted of a list of nine terms which called for information the user had to input next to a vertical numerical listing of part numbers, part names, customer name, job number, number of pieces, personal, fatigue and delay, machinery ratio, scrap rate, and the estimator's initials, in that particular order.²⁰¹ These terms were not so limited by functional determinations, according to the court, that the form of expression was necessarily incident to the idea of identifying a particular job. For one thing, the terms were redundant; only a few terms would have been sufficient to conform to functionality. Moreover, the court found the terms constituted an original selection and arrangement. Even though the order of defendant's list was different from plaintiff's job identification listing, the court found the duplication of terms sufficient to make out substantial similarity.

The Cams court took pains to analyze the copyrightability in an attempt to draw bright lines, discussing what was and was not copyrightable about each screen. The court's statement that compilations are excellent examples of the minimal nature of originality required in the computer field²⁰² is somewhat perplexing and may be revisited in light of Feist Publications, Inc. v. Rural Telephone Service Company, Inc.²⁰³ In the computer field the requirement of originality is the same as the requirement for other copyrightable compilations. Moreover, the amount of protection accorded to

201 Id. at 997.

202 Id. at 994.

203 111 S. Ct. 1282 (1991).

compilations should pertain to the selection, ordering and arrangement, and not the data itself.

In Telemarketing Resources v. Symantec Corp., ²⁰⁴ the court held copyrightable the "look and feel" of the plaintiff's screen display outline and the overall organization of computer programs, including their user interfaces. Nevertheless, the court found that the defendant's program "Grand View," although similar in its essence, was distinct in its expression of ideas. The similarities, such as similar pull down menus, a menu editing screen for entering and editing data, and an "opening menu," inhered in the idea of an outlining program, and thus could not be the basis for finding impermissible copying. The court found that "plaintiffs may not claim copyright protection of an idea and expression that is, if not standard, then commonplace in the computer industry." ²⁰⁵

Apple Computer, Inc. v. Microsoft Corp., ²⁰⁶ held that the licensee, Microsoft had authority to use certain derivative works, "windows," in present and future computer programs, but that its use of visual displays to create other enhancements exceeded the terms of its license. Microsoft had authority to use only the images as they appeared to the user at that time. The license did not cover any visual display that an applications program could generate using licensee's program. ²⁰⁷ The issue had to do with whether the licensee could create overlapping windows from tiled

²⁰⁴ 12 U.S.P.Q. 2d 1991 (N.D. Cal. 1989).

²⁰⁵ Id. at 1995.

²⁰⁶ 709 F.Supp. 925 (N.D.Cal. 1989); 717 F. Supp. 1428 (N.D.Cal. 1989); 18 U.S.P.Q. 2d 1097 (Mar. 6, 1991).

²⁰⁷ 709 F.Supp. at 930.

windows, that is, whether the images of text come up side by side or overlap.²⁰⁸ Most of the visual display elements claimed to be infringed were held to be licensed: the appearance of the individual main application windows, the dialogue boxes, the menus, as well as the applications programs themselves. The capability of opening and collapsing windows into icons were also licensed. The representation of multiple main application windows, particularly the location and display of icons on the screen, were held unlicensed.²⁰⁹ The court then announced that it would go on to determine whether use of the unlicensed visual displays constitutes infringement.

In Xerox Corp. v. Apple Computer, Inc.,²¹⁰ Xerox sought a motion for declaratory judgment to establish its sole ownership of its "Star" copyrighted software, including features thereof found in Apple's "Lisa" and "Macintosh Finder." Xerox also sought a court order to direct the Copyright Office to cancel Apple's registrations of these works. The court denied all counts of Xerox's actions except to give it one month to substantiate "a real and reasonable fear of liability."²¹¹ Regarding Apple's copyright registrations the court said no private right existed to cancel a copyright, and dismissed the associated claims.

In the celebrated case of Lotus v. Paperback,²¹² the court found copyrightable the menu structure of the Lotus 1-2-3 spreadsheet, "including

²⁰⁸ 717 F.Supp. at 1434-35.

²⁰⁹ Id.

²¹⁰ 734 F.Supp. 1542 (N.D.Cal. 1990).

²¹¹ Id. at 1553.

²¹² 740 F.Supp. 37 (D. Mass. 1990).

the choice of command terms, the structure and order of those terms, their presentation on the screen, and the long prompts." The copyright was infringed by Paperback's spreadsheet "V-P Planner."

Judge Keeton's analysis, running to 50 pages, noted that nonliteral as well as literal expression of computer programs is protected. (One usually encounters nonliteral "copying" as opposed to nonliteral protection. In the copying context, this means that a close paraphrase is prohibited just as verbatim copying is prohibited. A difficulty that nonliteral protection presents is the failure to state what is protected.) The court here found that nonliteral elements could embody original expression.²¹³ On the basis of expert testimony, the court found that "the bulk of the creative work is in the conceptualizing of a computer program and its user interface, rather than in its encoding, and that creating a suitable user interface is a more difficult intellectual task, requiring greater creativity, originality, and insight, than converting the user interface design into instructions to the machine."²¹⁴

Therefore, the court felt that nonprotection of the comparatively greater creative endeavor would be at odds with the mandate of the copyright statute and the constitutional rationale upon which it is based. In turn, the court dealt with and rejected the major legal theories that can operate

²¹³ Id. at 77.

²¹⁴ Id. at 56.

in the computer field to deny copyright protection to user interfaces when faced with another interface similar in structure and organization. 215

To the extent that a computer program constitutes a "useful article," the court noted that Commissioner Hersey in the course of CONTU deliberations, made similar arguments in dissent, unpersuasive at the time, which Judge Keeton said are still inconsistent with the legislative history and the statutory mandate. 216 Applying the often cited "patterns of abstractions" test from Judge Learned Hand's holding in Nichols v. Universal Pictures Corp., 217 Judge Keeton found the ideas in this case were an electronic spread sheet program and a two-line moving cursor menu. Both were functional and obvious, and therefore uncopyrightable. 218 The court also found that the basic spreadsheet display as a "rotated L," and the designation of a particular key to invoke the menu command system, were uncopyrightable because there were only a few ways to express them. 219

The court held copyrightable "the overall menu structure, the order of commands in each menu line, the choice of letters, words, or 'symbolic tokens' to represent each command, the presentation of these symbolic tokens on the screen (i.e. first letter only, abbreviations, full words, full words with one or more letters capitalized or underlined), the

215 One problem with protecting organization is that it is not usually acknowledged that the protection goes only to the organization and not the items organized therein.

216 740 F. Supp. at 56-58.

217 45 F.2d 119 (2d Cir. 1930).

218 740 F. Supp. at 65.

219 Id. at 66.

type of menus system used (i.e. one-, two-, or three-line cursor menus, pull down menus, or command-driven interfaces and the long prompts)" because they could be expressed in a great many, if not literally unlimited ways. 220 Even where command terms are merged with the idea, Judge Keeton held copyright protection is available for the structure "taken as a whole," noting that copyright protection is available for uncopyrightable elements brought together as a distinctive whole. The court then proceeded to find access and substantial similarity.

In Ashton-Tate Corp. v. Ross, 221 the court found the spreadsheet "Full Impact" was owned by the plaintiff and that the person through whom the defendant had claimed authorship had not made a copyrightable contribution to the textual screen display to entitle him to be a joint author of the derivative work, the user interface. The contribution was a handwritten list of user commands on a single sheet of paper. Thereby, the court confirmed the rule that joint authorship requires the contribution of a copyrightable amount.

In Ashton-Tate v. Fox Software, 222 the court held that Ashton-Tate failed to disclose material information to the Copyright Office (i.e., that its line of D-Base computer software was derived from public domain software developed for the federal government). The court held that this nondisclosure of material information was done knowingly with intent to deceive. Ashton-Tate's copyrights were therefore invalid as a result of its

220 Id. at 67.

221 916 F.2d 516.

222 Copr. L.Rep. (CCH) ¶26,679 (C.D.Cal. Dec. 12, 1990).

inequitable conduct. Ashton-Tate then requested the court to reconsider its order.

In April 1991, after receiving a Declaration from Register of Copyrights Ralph Oman regarding the procedures for registering copyright claims, for correcting claims, and for identifying derivative works on copyright applications, the district court reversed its decision that invalidated the copyrights, thus allowing the case to go forward on the issue of copyright infringement.

c. Concern about the scope of copyright protection for user interfaces. Some commentators are of the opinion that the courts are giving overbroad protection to user interfaces of computer programs, that is, to textual screen displays, icons, minimal listings of phrases, and compilations of terms.²²³ Critics argue that the courts are either approaching or have already reached an inappropriate level of protection for these minimal elements of computer programs.²²⁴

The opposing point of view is that protection is not overbroad, that copyright has worked well to encourage the creation of diverse software products, and the courts can be trusted to make any necessary adjustments in the scope of protection. These proponents maintain that courts are applying traditional principles of law to computer program cases in traditional manner. No new doctrines are being devised to deal with new technology.

²²³ See e.g., G. Damman, Copyright of Computer Display Screens: Summary and Suggestions, Computer/Law Journal, Vol. IX, No. 4, 417 (1989).

²²⁴ Samuelson & Glusko, Survey on the Look and Feel of Lawsuits, Communications of the ACM, Vol. 33, No. 5 (May 1990), at 483. (Hereafter Samuelson and Glusko). This survey found that the more technical experts found out about copyright the more they favored weaker look and feel protection.

They note that courts will probably not extend the scope of copyright protection inappropriately, for example, to protect underlying algorithms. 225 Confusion does not reign in the court, other commentators note. It is now clear that "look and feel," which relates to pictorial authorship in a screen display, is different from structure, sequence, and organization, which relates to compilation authorship and that overall look and feel of a computer program is not protectible per se. It is also crystal clear that while displays and other specific output can be protected by copyright, ideas and blank forms cannot. Expression of ideas, and not ideas themselves, is that which is subject to copyright protection. 226

Other argue that, given the nature of software and its omnipresence in emerging technologies, computer software deserves more extensive protection. If not, the law will be doomed to follow developments in technology at a time when it is critical that the law anticipate some of these developments. 227

At the bottom of this debate, it appears is the question of protection of functionality. Some commentators are concerned that what passes for protection of minimal authorship elements in the user interface context is in actuality, protection of the functionality of the software itself. Such a result would be contrary to the statutory provision barring

225 Einhorn, Copyright and Patent Protection for Computer Software: Are They Mutually Exclusive? 3, Vol. VIII, No. 12, Software Protection, May 1990.

226 Abramson, "Look and Feel" of Computer Software, 6-7 Case & Comment, January-February 1990.

227 Bhojwani, Copyright Laws and the Nature of Computer Software, 10 Vol. IX, No. 1, Software Protection, June 1990.

copyright protection to ideas, procedures, processes, systems, methods of operation, concepts, principles, or discoveries, regardless of the form in which they are described. Such protection is assigned to patents where a much more rigorous test must be undergone and the barriers to entry, in terms of time, cost, and complexity, are higher. Moreover, at least for copyright, practitioners note that the constitutional objective of producing copyrightable intellectual works is being met, so that no additional incentive is necessary. ²²⁸ According to this theory, overbroad protection actually works as a disincentive to such creation.

6. Summary of Copyright Office Review of Computer Programs and User Interfaces.

In conclusion, it is premature to predict whether an actual overlap between copyright and design patents respecting user interfaces will materialize, pending the review by the Board of Patent Appeals and Interferences of rejections of claims in design patent applications drawn to icons.

With respect to computer programs in general, there is no overlap in subject matter: patents cover novel and nonobvious processes and copyrights cover literary works that are sets of statements intended to bring about a certain result in a computer.

Although the theory of copyright and patent law makes clear that there is no overlap of subject matter respecting computer programs, some

²²⁸ See Samuelson, *supra* n. 23. Cf. Proposed Resolution 701-1 of the American Bar Association "that the Section of Patent, Trademark and Copyright Law opposes in principle any exclusion of software expression from a patented process, and opposes in principle any exclusion of software from patent protection merely because the software expression is protected by copyright." 1989 A.B.A. Sec. Patent, Trademark and Copyright Committee Reports 394.

commentators perceive problems because of court interpretation of the copyright law in a way that, they contend, approaches patent protection for inventions. Critics point to infringement awards for copying the "total concept and feel" of a program, and charge that the courts misapply two doctrines -- the idea-expression dichotomy and the "abstractions" test for infringement -- to protect the structure, sequence, and organization of computer programs. They argue that structure, sequence, and organization is in essence a compilation claim -- one that is in furtherance of a utilitarian purpose. It is one thing for a court to apply the abstractions test to a plot for a dramatic work, which merely tells a story, and quite another to apply it to a computer program, which fulfills a useful purpose.

Other commentators feel that the courts are applying traditional principles of law to computer program cases and that no new doctrines are being devised. They urge that there is no confusion between "look and feel," which relates to pictorial authorship, and structure sequence, and organization, which relates to compilation authorship. Some even urge that computer software deserves stronger protection.

Courts continue to wrestle with the extent of protection appropriate for "nonliteral" copying. The Copyright Office concludes that it is premature to determine whether the courts have extended overbroad protection to computer programs. Considering the state of flux in the law, Congress may choose to adopt a wait and see attitude before considering amendment to the copyright law regarding protection of computer programs.

V. CONCLUSIONS

Copyright protects an author's original, creative expression, and specifically excludes protection for ideas, concepts, systems, methods of operation, procedures, processes, principles, or discoveries. The utility patent law, on the other hand, protects inventions that meet the novelty and other standards of the statute.

With respect to computer programs in general, there is no overlap in subject matter: patents cover novel and nonobvious processes and copyrights cover literary works that are sets of statements intended to bring about a certain result in the operation of a computer. However, there may be overlap in protection because a utility patent claiming a computer process might prevent one who wrote an original computer program from using that program in a computer during the term of the patent.

The only significant subject matter overlap between the patent and copyright systems is in the area of design patents and copyrights on artistic expressions embodied in useful articles. This situation has existed for many years and has not appeared to create any undue problems.

With respect to computer user interface icons, the U.S. Patent and Trademark Office after having issued 21 patents on icons, is now rejecting claims drawn to icons as being non-statutory subject matter under the design patent statute. These rejections have been appealed to the the Board of Patent Appeals and Interferences. If the rejections are ultimately affirmed on appeal to the Board or the courts, there should be no overlap regarding user interface icons.

With respect to election of protection between design patent and copyright, the Patent and Trademark Office is bound by the In re Yardley decision and therefore does not require election. The Copyright Office, which is not bound by In re Yardley, follows the Second Circuit decision in Korzybski v. Underwood & Underwood and requires election between issued design patents and copyright registration for the same design. The Copyright Office, however, seeks guidance from the Congress regarding the proper interpretation of the Copyright Act of 1976 on the question of requiring an election between design patent and copyright protection.

The Copyright Office does not recommend any changes to the copyright law or its Office practice, nor does the U.S. Patent and Trademark Office recommend any changes to the patent laws or its practice at this time.

APPENDIX A

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ONE HUNDRED FIRST CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON THE JUDICIARY

2138 RAYBURN HOUSE OFFICE BUILDING

WASHINGTON, DC 20515-6216

August 3, 1990

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MAJORITY-225-3951

MINORITY-225-6908

Mr. Ralph Oman
Register of Copyrights
United States Copyright Office
Library of Congress
Washington D.C. 20559

Dear Mr. Oman:

As you are aware, the Subcommittee on Courts, Intellectual Property, and the Administration of Justice recently held hearings on the question of sui generis design legislation. Your Office was helpful in supplying us with examples of works submitted to you for registration. I was particularly interested in one deposit you had rejected, but which the Patent and Trademark Office had issued a design patent for. I understand, however, that in some cases a copyright registration has been made for a work which later also receives a patent. The issue of overlapping protection under the copyright and patent acts has also arisen in the computer program area, as you yourself have noted.

In order to better evaluate both the need for sui generis design protection and how well the current copyright and patent systems are handling overlapping claims, on behalf of the Subcommittee, I request that you establish a joint study team with the Patent and Trademark Office.

Without directing or limiting your work, I would find it informative if the Copyright Office and the Patent and Trademark Office would address the following issues: whether either or both agency has an election of remedies policy, and if, so what the authority is for such a policy; if there is such a policy, how many claims (by subject matter) are rejected based on a requirement of election; whether in the particular agency's opinion, there is a complete or only partial overlap in claims -- whether, for example, in the case of a computer program that has received a certificate of copyright registration, a patent for the program would be coextensive with the protection afforded by the copyright law. In this regard, I would also like you to provide information on registration practice with respect to so-called computer program "user interfaces" -- screen displays and the components thereof, such as commands and icons.

Mr. Ralph Oman
August 3, 1990
Page 2

While you are not required to do so, if, as a result of this study you come to the conclusion that revisions to our intellectual property system would be desirable, I would appreciate receiving such recommendations.

In view of the complexity of the tasks, I will work together with you and Commissioner Manbeck in setting a satisfactory schedule for submission of the study. Thank you in advance for your cooperation in this important matter.

With warm regards,

Sincerely,

A handwritten signature in dark ink, appearing to read "Bob Kastenmeier", written over the typed name.

ROBERT W. KASTENMEIER

Chairman

Subcommittee on Courts,

Intellectual Property, and the

Administration of Justice

RWK:mrk

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MAJORITY—225-3951

MINORITY—225-6906

August 14, 1990

Honorable Harry Manbeck
Assistant Secretary and
Commissioner of Patents and Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

Dear Mr. Commissioner:

As you know, the Subcommittee has been holding hearings on industrial design protection. The Patent and Trademark Office has been helpful in supplying us with examples of works submitted to you for design patents. I was particularly interested in one design patent that your Office has granted, but for which the Copyright Office rejected a registration. The issue of overlapping protection under the copyright and patent acts has also arisen in the computer program area.

In order to better evaluate both the need for sui generis design protection and how well the current copyright and patent systems are handling overlapping claims, on behalf of the Subcommittee, I request that you establish a joint study team with the Copyright Office.

Without directing or limiting your work, I would find it informative if the Patent and Trademark Office and the Copyright Office would address the following issues: whether either or both agency has an election of remedies policy, and if so, what the authority is for such a policy; if there is such a policy, how many claims (by subject matter) are rejected based on a requirement of election; whether in the particular agency's opinion, there is a complete or only partial overlap in claims -- whether, for example, in the case of a computer program that has received a certificate of copyright registration, a patent for the program would be coextensive with the protection afforded by the copyright law. In this regard, I would also like you to provide information on the practice with respect to so-called computer program "user interfaces" -- screen displays and the components thereof, such as commands and icons.

Honorable Harry Manbeck
August 14, 1990
Page 2

While you are not required to do so, if, as a result of this study you come to the conclusion that revisions to our intellectual property system would be desirable, I would appreciate receiving such recommendations.

In view of the complexity of the tasks, I will work together with you and Register Oman in setting a satisfactory schedule for submission of the study. A copy of my letter to Register Oman is enclosed. Thank you in advance for your cooperation in this important matter.

With warm regards,

Sincerely,

A handwritten signature in dark ink, appearing to read "Bob Kastenmeier", written in a cursive style.

ROBERT W. KASTENMEIER

Chairman

Subcommittee on Courts,

Intellectual Property, and the

Administration of Justice

RWK:mrk

Enclosure

APPENDIX B

Patentable Subject Matter

Mathematical Algorithms and Computer Programs

The following represents a recent legal analysis done by Associate Solicitor Lee E. Barrett, an attorney in the Office of the Solicitor of the Patent and Trademark Office, on the subject of the patentability of mathematical algorithms and computer programs. The analysis is published for the benefit of the public.

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I. Statutory Subject Matter - 35 U.S.C. § 101

Inventions may be patented only if they fall within one of the four statutory classes of subject matter of 35 U.S.C. § 101: "process, machine, manufacture, or composition of matter." See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 483, 181 USPQ 673, 679 (1974):

[N]o patent is available for a discovery, however useful, novel, and nonobvious, unless it falls within one of the express categories of patentable subject matter of 35 U.S.C. § 101.

Subject matter that does not fall within one of the statutory classes of 35 U.S.C. § 101 is said to be "nonstatutory" or to be "unpatentable subject matter."

The broad language of § 101 is intended to delineate a "general industrial boundary" of patentable invention. *In re Bergy*, 596 F.2d 952, 974 n.11, 201 USPQ 352, 372 n.11 (CCPA 1979), vacated, 444 U.S. 1028, *aff'd sub nom. Diamond v. Chakrabarty*, 447 U.S. 303, 206 USPQ 193 (1980). The first statutory class, process, is defined in 35 U.S.C. § 100(b) and refers to acts, while the last three classes, machine, manufacture and composition of matter, refer to physical things; therefore, the general field of patentable invention consists of new acts and new things. *Id.* The classes relevant to this discussion are "process" and "machine." A "process" is equivalent to a "method." *Bergy*, 596 F.2d at 965, 201 USPQ at 364. The term "machine" is used interchangeably with "apparatus." *In re Prater*, 415 F.2d 1393, 1395 n.11, 162 USPQ 541, 543 n.11 (CCPA 1969).

The question of whether a claimed invention satisfies the other conditions for patentability is "wholly apart from whether the invention falls into a category of statutory subject matter" (emphasis deleted). *Diamond v. Diehr*, 450 U.S. 175, 190, 209 USPQ 1, 9 (1981) (citing *Bergy*, 596 F.2d at 961, 201 USPQ at 361). As stated in *Parker v. Flook*, 437 U.S. 584, 593, 198 USPQ 193, 198-99 (1978):

The obligation to determine what type of discovery is sought to be patented must precede the determination of whether that discovery is, in fact, new [i.e., novel under § 102] or obvious [§ 103].

See also *In re Sarkar*, 588 F.2d 1330, 1333 n.10, 200 USPQ 132, 137 n.10 (CCPA 1978) ("If the subject matter as claimed is subject to patenting, i.e., if it falls within § 101, it must then be examined for compliance with §§ 102 and 103").

Legislative history indicates that Congress contemplated that the subject matter provisions be given a broad construction and were intended to "include anything under the sun that is made by man." *Diamond v. Chakrabarty*, 447 U.S. at 309, 206 USPQ at 197. Any process, machine, manufacture, or composition of matter constitutes statutory subject matter unless it falls within a judicially determined exception to § 101. *In re Pardo*, 684 F.2d 912, 916, 214 USPQ 673, 677 (CCPA 1982). Exceptions include laws of nature, physical phenomena and abstract ideas. *Diehr*, 450 U.S. at 185, 209 USPQ at 7, and cases cited therein. This analysis addresses whether mathematical algorithms and computer programs are statutory subject matter.

II. Mathematical Algorithms

A. Mathematical algorithms per se are not a statutory "process" under § 101

A mathematical algorithm is defined as a "procedure for solving a given type of mathematical problem." *Gottschalk v. Benson*, 409 U.S. 63, 65, 175 USPQ 673, 674 (1972); *Flook*, 437 U.S. at 585 n.1, 198 USPQ at 195 n.1; *Diehr*, 450 U.S. at 186, 209 USPQ at 8. Mathematical algorithms are non-statutory because they have been determined not to fall within the § 101 statutory class of a "process." *Benson*. "[A]n algorithm, or mathematical formula, is like a law of nature,

which cannot be the subject of a patent." *Diehr*, 450 U.S. at 186, 209 USPQ at 8. The exception applies only to mathematical algorithms since any process is an "algorithm" in the sense that it is a step-by-step procedure to arrive at a given result. *In re Walter*, 618 F.2d 758, 764 n.4, 205 USPQ 397, 405 n.4, (CCPA 1980); *Pardo*, 684 F.2d at 915, 214 USPQ at 676.

Although mathematical algorithms per se are nonstatutory, as stated in *Diehr*, 450 U.S. at 187-88, 209 USPQ at 8-9:

[A] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer. . . . [I]n *Parker v. Flook* we stated that "a process is not unpatentable simply because it contains a law of nature or a mathematical algorithm." 437 U.S. at 590. It is now commonplace that an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection. As Justice Stone explained four decades ago:

"While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939). [Citations omitted.]

The Supreme Court thus recognizes that mathematical algorithms are "the basic tools of scientific and technological work," *Benson*, 409 U.S. at 67, 175 USPQ at 675, and should not be the subject of exclusive rights, whereas technological application of scientific principles and mathematical algorithms furthers the constitutional purpose of promoting "the Progress of . . . Useful Arts." U.S. Const. art. I, § 8. It is also recognized that mathematical algorithms may be the most precise way to describe the invention.

Where claims involve mathematical algorithms, as stated in *In re Abele*, 684 F.2d 902, 907, 214 USPQ 682, 687 (CCPA 1982):

The goal is to answer the question "What did applicants invent?" If the claimed invention is a mathematical algorithm, it is improper subject matter for patent protection, whereas if the claimed invention is an application of the algorithm, § 101 will not bar the grant of a patent.

The tests for determining whether claims containing mathematical algorithms are statutory have gradually evolved in the courts since the Supreme Court's decision in *Benson* in 1972.

B. Evolution of the two-part test for mathematical algorithm-statutory subject matter

The proper legal analysis of mathematical algorithm-statutory subject matter cases is the two-part test of *In re Freeman*, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978), as modified by *Walter* and *Abele*. See *In re Meyer*, 688 F.2d 789, 796, 215 USPQ 193, 198 (CCPA 1982) ("A more comprehensive test for cases involving mathematical algorithms is set forth in *In re Abele*"). A review of the evolution of the analysis provides some useful insights into the application of the test.

In *Benson*, the Supreme Court concluded that claims directed to a particular algorithm for converting binary coded decimal numbers to binary numbers was not statutory subject matter. The Supreme Court further concluded that any patent issued on those claims "would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself." 409 U.S. at 72, 175 USPQ at 676. These two conclusions formed the basis for the two-part analysis of the Court of Customs and Patent Appeals (CCPA) in *Freeman*, 573 F.2d at 1245, 197 USPQ at 471:

First, it must be determined whether the claim directly or indirectly recites an "algorithm" in the *Benson* sense of that term, for a claim which fails even to recite an algorithm clearly cannot wholly preempt an algo-

arithm. Second, the claim must be further analyzed to ascertain whether in its entirety it wholly preempts that algorithm.

In 1978, the Supreme Court held in *Flook* that a claim need "not . . . cover every conceivable application of the formula" to be nonstatutory. 437 U.S. at 586, 198 USPQ at 196. This decision left undefined what constitutes statutory subject matter. In *Walter*, the CCPA modified the second step of *Freeman* to require a more positive approach to determining what is claimed, 618 F.2d at 767, 205 USPQ at 407:

If it appears that the mathematical algorithm is implemented in a specific manner to define structural relationships between the physical elements of the claim (in apparatus claims) or to refine or limit claim steps (in process claims), the claim being otherwise statutory, the claim passes muster under § 101. If, however, the mathematical algorithm is merely presented and solved by the claimed invention, as was the case in *Benson* and *Flook*, and is not applied in any manner to physical elements or process steps, no amount of post-solution activity will render the claim statutory; nor is it saved by a preamble merely reciting the field of use of the mathematical algorithm.

The CCPA noted that while the second step of *Freeman* was "stated in terms of preemption" it had consistently been applied "in the spirit of the foregoing principles." 618 F.2d at 767, 205 USPQ at 407.

In *Abele*, the CCPA further modified the second part of the test to provide a more comprehensive test, 684 F.2d at 906-7, 214 USPQ at 686:

Appellants summarize the *Walter* test as setting forth two ends of a spectrum: what is now clearly nonstatutory, i.e., claims in which an algorithm is merely presented and solved by the claimed invention (preemption), and what is clearly statutory, i.e., claims in which an algorithm is implemented in a specific manner to define structural relationships between the physical elements of the claim (in an apparatus claim) or to refine or limit steps (in a process). Appellants urge that the statement of the test in *Walter* fails to provide a useful tool for analyzing claims in the "gray area" which falls between the two ends of that spectrum. We agree that the board's understanding and application of the *Walter* analysis justifies appellant's position. However, the *Walter* analysis quoted above does not limit patentable subject matter only to claims in which structural relationships or process steps are defined, limited or refined by the application of the algorithm.

Rather, *Walter* should be read as requiring no more than that the algorithm be "applied in any manner to physical elements or process steps," provided that its application is circumscribed by more than a field of use limitation or non-essential post-solution activity. Thus, if the claim would be "otherwise statutory," *id.*, albeit inoperative or less useful without the algorithm, the claim likewise presents statutory subject matter when the algorithm is included. This broad reading of *Walter*, we conclude, is in accord with the Supreme Court decisions [holding "that a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer." *Diamond v. Diehr*, 450 U.S. at 187, 209 USPQ at 8].

The reason for the modification of the test was because, as noted in *Abele*, 684 F.2d at 909, 214 USPQ at 688:

The algorithm [in *Abele*] does not necessarily refine or limit the earlier steps of production and detection as would be required to achieve the status of patentable subject matter by the board's narrow reading of *Walter*.

The second test of *Abele* suggests that the determination of whether the algorithm is "applied in any manner to physical element or process steps" may be made by viewing the claims

without the algorithm and determining whether what remains is "otherwise statutory." This analysis focuses on identifying the statutory process in the claim and is consistent with previous cases such as *Walter*, 618 F.2d at 769, 205 USPQ at 409 ("Examination of each claim demonstrates that each has no substance apart from the calculations involved"). The technique of viewing the claim without the mathematical algorithm is not inconsistent with the requirement that claims must be considered "as a whole" under § 101.

The requirement that claims be considered "as a whole" arose out of the now rejected "point of novelty" approach to statutory subject matter. Under the "point of novelty" approach, if a claim considered without the nonstatutory subject matter was unpatentable over the prior art (i.e., if the algorithm was at the "point of novelty" of the claim), the claims were found to not recite statutory subject matter. This approach was consistently rejected by the CCPA. See *In re Chatfield*, 545 F.2d 152, 191 USPQ 730 (CCPA 1976), *cert. denied*, 434 U.S. 875 (1977); *In re Deutsch*, 553 F.2d 689, 193 USPQ 645 (CCPA 1977); *In re de Castelet*, 562 F.2d 1236, 195 USPQ 439 (CCPA 1977); *Freeman*; *Sarkar*; *Walter*. The point of novelty approach was finally put to rest in *Diehr*, 450 U.S. at 188-89, 209 USPQ at 9:

In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. . . . The "novelty" of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.

Under the second test of *Abele*, the claims are considered without the algorithm to determine whether what remains is "otherwise statutory," not to determine whether what remains is novel and nonobvious.

C. Application of the two-part test

1. Step 1 - presence of a mathematical algorithm a. Mathematical algorithm

A mathematical algorithm is a "procedure for solving a given type of mathematical problem." In this sense, a mathematical algorithm refers "to methods of calculation, mathematical formulas, and mathematical procedures generally." *Walter*, 618 F.2d at 764-65 n.4, 205 USPQ at 405 n.4. "The type of mathematical computation involved does not determine whether a procedure is statutory or nonstatutory." *In re Gelinovarch*, 595 F.2d 32, 41, 201 USPQ 136, 145 (CCPA 1979). A "claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under § 101." *Flook*, 437 U.S. at 595 n.18, 198 USPQ at 199 n.18.

Mathematical algorithms may represent scientific principles, laws of nature, or ideas or mental processes for solving complex problems. See *Meyer*, 688 F.2d at 794-95, 215 USPQ at 197:

Scientific principles, such as the relationship between mass and energy [$E = mc^2$], and laws of nature, such as the acceleration of gravity, namely $a = 32 \text{ ft./sec.}^2$, can be represented in mathematical format. However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems.

See also *Safe Flight Instrument Corp. v. Sundstrand Data Control, Inc.*, 706 F. Supp. 1146, 10 USPQ2d 1733 (D.Del. 1989) (mathematical algorithm representing a natural phenomenon, windshear). No distinction is made between mathematical algorithms invented by man, and mathematical algorithms representing discoveries of scientific principles and laws of nature which reveal a relationship that has always existed.

b. "Process" versus "apparatus" claims

Since mathematical algorithms have been determined not to fall within the § 101 statutory class of a "process," attempts have been made to circumvent the nonstatutory subject matter rejection by drafting mathematical algorithms as "machine" claims. The technique used is to draft the method steps in terms of "means for" language permitted by 35 U.S.C. § 112, sixth paragraph. While such a claim is technically a "machine" or "apparatus" claim, the courts have held that form of the claim does not control whether the subject matter is statutory. See *In re Maucorps*, 609 F.2d 481, 485, 203 USPQ 812, 815-16 (CCPA 1979):

Labels are not determinative in § 101 inquiries. "*Benson* applies equally whether an invention is claimed as an apparatus or process, because the form of the claim is often an exercise in drafting." *In re Johnson*, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978). "Though a claim expressed in 'means for' (functional) terms (under 35 U.S.C. § 112, sixth paragraph) is said to be an apparatus claim, the subject matter as a whole of that claim may be indistinguishable from that of a method claim drawn to the steps performed by the 'means.'" *In re Freeman*, 573 F.2d at 1247, 197 USPQ at 472. Moreover, that the claimed computing system may be a "machine" within "the ordinary sense of the word," as appellant argues, is irrelevant. The holding in *Benson* "forecloses a purely literal reading of § 101."

The test for determining whether "means for" apparatus claims should be treated as method claims is stated in *Walter*, 618 F.2d at 768, 205 USPQ at 408:

If the functionally-defined disclosed means and their equivalents are so broad that they encompass any and every means for performing the recited functions, the apparatus claim is an attempt to exalt form over substance since the claim is really to the method or series of functions itself. . . . In such cases the burden must be placed on the applicant to demonstrate that the claims are truly drawn to specific apparatus distinct from other apparatus capable of performing the identical functions.

If this burden has not been discharged, the apparatus claim will be treated as if it were drawn to the method or process which encompasses all of the claimed "means." See *In re Maucorps*, 609 F.2d at 485, 203 USPQ at 815-816; *In re Johnson*, 589 F.2d at 1077, 200 USPQ at 206; *In re Freeman*, 573 F.2d at 1247, 197 USPQ at 472. The statutory nature of the claim under § 101 will then depend on whether the corresponding method is statutory.

See also *Meyer*, 688 F.2d at 795 n.3, 215 USPQ at 198 n.3; *Abele*, 684 F.2d at 909, 214 USPQ at 688; *Pardo*, 684 F.2d at 916 n.6, 214 USPQ at 677 n.6; *Arshal v. United States*, 621 F.2d 421, 427-28, 208 USPQ 397, 404 (Cl. Ct. 1980), cert. denied, 449 U.S. 1077 (1981), reh'g denied, 450 U.S. 1050 (1981). In *Maucorps*, the limitation of various "means" in claim 1 to include certain "electric circuits" did not prevent the claim from being treated as a method. A claim is not presumed to be statutory simply because it is in apparatus form.

c. Form of the mathematical algorithm

The first step of the analysis is to determine whether the claim directly or indirectly recites a mathematical algorithm. A mathematical algorithm can appear in many forms. As stated in *Freeman*, 573 F.2d at 1246, 197 USPQ at 471:

The manner in which a claim recites a mathematical algorithm may vary considerably. In some claims, a formula or equation may be expressed in traditional mathematical symbols so as to be immediately recognizable as a mathematical algorithm. See, e.g., *In*

re Richman, 563 F.2d 1026, 195 USPQ 340 (CCPA 1977); *In re Flook*, 559 F.2d 21, 195 USPQ 9 (CCPA 1977), cert. granted sub nom., *Parker v. Flook*, 437 U.S. 584 (1978). Other claims may use prose to express a mathematical computation or to indirectly recite a mathematical equation or formula by means of a prose equivalent therefor. See, e.g., *In re de Castelet*, supra (claims 6 and 7); *In re Waldbaum*, 559 F.2d 611, 194 USPQ 465 (CCPA 1977). A claim which substitutes, for a mathematical formula in algebraic form, "words which mean the same thing," nonetheless recites an algorithm in the *Benson* sense. *In re Richman*, supra 563 F.2d at 1030, 195 USPQ at 344. Indeed, the claims at issue in *Benson* did not contain a formula or equation expressed in mathematical symbols.

Claims which include mathematical formulas or calculations expressed in mathematical symbols clearly include a mathematical algorithm. Mathematical algorithms in prose form may be expressed as literal translations of the mathematical algorithm (e.g., substituting the expression "division" or "taking the ratio" for a division sign) or may be expressed in words which indicate the mathematical algorithm. See *Safe Flight Instrument*, 706 F. Supp. at 1148, 10 USPQ2d at 1734 (subtracting); *Abele*, 684 F.2d at 908 n.8, 214 USPQ at 687 n.8 ("The algorithm, calculating the difference, is defined in the specification as a Gaussian weighting function"); *In re Taner*, 681 F.2d 787, 790, 214 USPQ 678, 681 (CCPA 1982) (summing); *In re Johnson*, 589 F.2d 1070, 1079, 200 USPQ 199, 208 (CCPA 1978) ("computing" connotes the execution of one or a sequence of mathematical operations"); *In re Waldbaum*, 559 F.2d 611, 194 USPQ 465 (CCPA 1977) (method of claim 1 "to count" the number of busy lines "solves a mathematical problem, to wit, counting a number of busy lines in a telephone system," *In re Bradley*, 600 F.2d 807, 810 n.4, 202 USPQ 480, 484 n.4 (CCPA 1979), aff'd by an equally divided court sub nom., *Diamond v. Bradley*, 450 U.S. 381, 209 USPQ 97 (1981)).

It is not always possible to determine by inspection of the claim whether it indirectly recites a mathematical algorithm: in such instances the analysis "requires careful interpretation of each claim in the light of its supporting disclosure." *Johnson*, 589 F.2d at 1079, 200 USPQ at 208. See also *id.* at 1078-79, 200 USPQ at 208 ("the flow diagrams which form part of the specification disclose explicit mathematical equations which are to be used in conjunction with each of these [claimed] steps [of 'determining' or 'correlating']"); *Waldbaum*, 559 F.2d 611, 194 USPQ 465 ("series of steps for manipulating binary numbers within a procedure for calculating the number of binary 1's and 0's present" was considered a mathematical algorithm, *Gelnovatch*, 595 F.2d at 39, 201 USPQ at 143); *In re Sherwood*, 613 F.2d 809, 818, 204 USPQ 537, 545 (CCPA 1980), cert. denied, 450 U.S. 994 (1981) ("claims must be said to include the indirect recitation of a mathematical equation"); *Meyer*, 688 F.2d at 795, 215 USPQ at 198 (claims indirectly "recite a mathematical algorithm, which represents a mental process that a neurologist should follow").

2. Step 2- is the mathematical algorithm "applied in any manner to physical elements or process steps?"

The second test is to determine whether the mathematical algorithm is "applied in any manner to physical elements or process steps." The guideline for the analysis should be the CCPA's suggestion in *Abele* to view the claim without the mathematical algorithm to determine whether what remains is "otherwise statutory"; if it is, it does not become nonstatutory simply because it uses a mathematical algorithm. It is recognized that "[t]he line between a patentable 'process' and an unpatentable 'principle' is not always clear." *Flook*, 437 U.S. at 589, 198 USPQ at 197. There are no definitive "tests for determining whether a claim positively recites statutory subject matter." *Meyer*, 688 F.2d at 796 n.4, 215 USPQ at 198 n.4. Nevertheless, some useful guidelines may be synthesized out of the court decisions.

a. Post-solution activity

If the only limitation aside from the mathematical algorithm is insignificant or non-essential "post-solution activity," the claimed subject matter is nonstatutory. *Flook*, 437 U.S. at 590, 198 USPQ at 197:

The notion that post-solution activity... can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques.

Insignificant post-solution activity by itself is insufficient to constitute a statutory process. In *Flook*, the final step of adjusting an alarm limit was not sufficient. See also *Safe Flight* (final step of "means for processing said windshear signal to provide an indication representing the magnitude thereof" not sufficient); *Abele*, 684 F.2d at 909, 214 USPQ at 688 (final step of display: "that the result is displayed as a shade of gray rather than as simply a number provides no greater or better information, considering the broad range of applications encompassed by the claims"); *Walter*, 618 F.2d at 770, 205 USPQ at 409 (final step in dependent claim of magnetic recording: "If § 101 could be satisfied by the mere recordation of the results of a nonstatutory process on some record medium, even the most unskilled patent draftsman could provide for such a step"); *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 (final step of storing outputs: "each of the steps of the claimed process, except perhaps the final step of equating the process outputs to the values of the last set of process inputs, directly or indirectly recites a mathematical computation"); *Sarkar*, 588 F.2d at 1332 n.6, 200 USPQ at 136 n.6 (final step of constructing an obstruction at a location determined by a mathematical model: "Sarkar no longer relies upon bridge of dam construction as post-solution activity steps effective to bring his process within § 101"); *de Castelet*, 562 F.2d at 1244, 195 USPQ at 446 (final step of transmitting: "That the computer is instructed to transmit electrical signals, representing the result of its calculations... does not transform the claim into one for a process merely using an algorithm").

The absence of post-solution activity or the fact that any post-solution activity may be trivial is only one factor to be considered. On one hand, as stated in *Walter*, 618 F.2d at 767-68, 205 USPQ at 407:

if the end-product of a claimed invention is a pure number, as in *Benson* and *Flook*, the invention is nonstatutory regardless of any post-solution activity which makes it available for use by a person or machine for other purposes.

On the other hand, as stated in *Abele*, 684 F.2d at 908 n.9, 214 USPQ at 687 n.9:

"the fact that [the] equation is the final step is not determinative of the section 101 issue." *In re Richman*, 563 F.2d at 1030, 195 USPQ at 343. Accord, *In re Taner*, 681 F.2d 787 (CCPA) 1982, overruling *In re Christensen*, 478 F.2d 1392, 178 USPQ 35 (CCPA) 1973).

The particular order of the steps should not be determinative of the statutory subject matter inquiry.

b. Field of use limitations

A mathematical algorithm is not made statutory by "attempting to limit the use of the formula to a particular technological environment." *Diehr*, 450 U.S. at 191, 209 USPQ at 10. Thus, "field of use" or "end use" limitations in the claim preamble are insufficient to constitute a statutory process. This is consistent with the usual treatment of preambles as merely setting forth the environment. See *Flook* (the preamble, while limiting the application of the claimed method to "a

process comprising the catalytic chemical conversion of hydrocarbons" did not serve to render the method statutory); *Walter*, 618 F.2d at 769, 205 USPQ at 409 ("Although the claim preambles relate the claimed invention to the art of seismic prospecting, the claims themselves are not drawn to methods of or apparatus for seismic prospecting"); *de Castelet*, 562 F.2d at 1244 n.6, 195 USPQ at 446 n.6 ("The potential for misconstruction of preamble language requires that compelling reason exist before that language may be given weight"). Compare *Waldbaum*, 559 F.2d at 616 n.6, 194 USPQ 469 n.6 (portion of preambles referred to in method portion of claims "are necessary for completeness of the claims and are proper limitations thereto").

c. Data-gathering steps

If the only limitations in the claims in addition to the mathematical algorithm are data-gathering steps which "merely determine values for the variables used in the mathematical formulae used in making the calculations," such antecedent steps are insufficient to change a nonstatutory method of calculation into a statutory process. See *In re Richman*, 563 F.2d at 1030, 195 USPQ at 343; *Sarkar*, 588 F.2d at 1335, 200 USPQ at 139 ("If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to patenting as a 'process' under § 101"); *Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7 ("claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step"). Where the claim "presents data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps" the claim may present statutory subject matter. *Abele*, 684 F.2d at 908, 214 USPQ at 687.

d. Transformation of something physical

In determining whether the claim recites a statutory process or a nonstatutory mathematical algorithm, it is useful to analyze whether there is transformation of something physical into a different form. One distinction is made between transformation of physical "signals" from one physical state to a different physical state, a statutory process in the electrical arts, and mere mathematical manipulation of "data" which, by itself, is not a statutory process. Compare *Taner* (conversion of "substantially spherical seismic signals" into "a form representing the earth's response to cylindrical or plane waves" was statutory process); *Sherwood*, 613 F.2d at 819, 204 USPQ at 546 (conversion of amplitude-versus-time seismic traces into amplitude-versus-depth seismic traces was statutory process because it "converts one physical thing into another physical thing just as any other electrical circuitry would do"); and *Johnson* (technique for removing unwanted noise from a seismic trace was statutory process); with *Walter*, 618 F.2d at 768, 770, 205 USPQ at 407, 409 (if "the claimed invention produces a physical thing... the fact that it is represented in numerical form does not render the claim nonstatutory" but finding that the "signals" claimed "may represent either physical quantities or abstract quantities" and thus were to the algorithm itself and not a particular application); *Richman* (method of calculating airborne radar boresight correction angle from "a plurality of signal sets" not statutory); *Gelnovatch*, 595 F.2d at 42, 201 USPQ at 145 (where "the claims solely recite a method whereby a set of numbers is computed from a different set of numbers by merely performing a series of mathematical computations, the claims do not set forth a statutory process"); and *Benson* (conversion of binary coded decimal numbers into pure binary numbers not statutory). It is manifest that the statutory nature of the subject matter does not depend on the labels "signals" or "data."

e. Structural limitations in process claims

Another issue is the effect of structural limitations in method claims. While structural limitations in method claims are not improper, they are usually not entitled to patentable weight unless they somehow affect or form an essential part of the

process. See *Benson*, 409 U.S. at 73, 175 USPQ at 677 (claim 8 recited use of a "reentrant shift register"); *Waldbaum*, 559 F.2d at 616, 194 USPQ at 469 (machine limitations in data processor method claims); *de Casteler*, 562 F.2d at 1244, 195 USPQ at 447 ("Claims to nonstatutory processes do not automatically and invariably become patentable upon incorporation of reference to apparatus"). The related problem of specific structural language in apparatus claims has been treated, *supra*, in section II.C.1.b.

D. Examples

1. *Diamond v. Diehr*

The following claim was held to recite statutory subject matter.

1. A method of operating a rubber-molding press for precision molded compounds with the aid of a digital computer, comprising:
 - providing said computer with a data base for said press including at least,
 - natural logarithm conversion data (ln),
 - the activation energy constant (C) unique to each batch of said compound being molded, and
 - a constant (x) dependent upon the geometry of the particular mold of the press,
 - initiating an interval timer in said computer upon the closure of the press for monitoring the elapsed time of said closure,
 - constantly determining the temperature (Z) of the mold at a location closely adjacent to the mold cavity in the press during molding,
 - constantly providing the computer with the temperature (Z),
 - repetitively calculating in the computer, at frequent intervals during each cure, the Arrhenius equation for reaction time during the cure, which is

$$\ln v = CZ + x$$
 where v is the total required cure time,
 - repetitively comparing in the computer at said frequent intervals during the cure each said calculation of the total required cure time calculated with the Arrhenius equation and said elapsed time, and
 - opening the press automatically when a said comparison indicates equivalence.

Step 1 The claim contains an equation for controlling the in-mold time: $\ln v = CZ + x$.

Step 2 The claimed subject matter is statutory because it recites an "otherwise statutory" process in addition to the mathematical algorithm. As stated in *Abele*, 684 F.2d at 907, 214 USPQ at 686:

In *Diehr*, were the claims to be read without the algorithm, the process would still be a process for curing rubber, although it might not work as well since the in-mold time would not be as accurately controlled.

The steps in the process, 450 U.S. at 187, 209 USPQ at 8:

include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time.

The statutory nature of the claim is not based on the post-solution activity of opening the press, but on the application of the mathematical algorithm to the whole process.

2. *Parker v. Flook*

The following claim in *Flook* was held to recite nonstatutory subject matter.

1. A method for updating the value of at least one alarm limit on at least one process variable involved in a process comprising the catalytic chemical con-

version of hydrocarbons wherein said alarm limit has a current value of

$$Bo + K$$

wherein Bo is the current alarm base and K is a predetermined alarm offset which comprises:

- (1) determining the present value of said process variable, said present value being defined as PVL;
- (2) determining a new alarm base B1 using the following equation:

$$B1 = Bo(1.0 - F) + PVL(F)$$

where F is a predetermined number greater than zero and less than 1.0;

- (3) determining an updated alarm limit which is defined as B1 + K; and thereafter
- (4) adjusting said alarm limit to said updated alarm limit value.

Step 1 The claim contains a mathematical algorithm comprising determining a new alarm base in step (2) and computing an "alarm limit" in step (3).

Step 2 When viewed without the steps of the mathematical algorithm, steps (2) and (3), the only limitations remaining are the preamble limitation restricting the field of use to "a process comprising the catalytic chemical conversion of hydrocarbons"; the data-gathering step of step (1); and the post-solution step of step (4). None of these limitations comprises an "otherwise statutory" process. The claim seeks to protect a method for computing an "alarm limit" rather than the application of the computation within an otherwise statutory process.

3. *In re Abele*

In *Abele*, claim 5 was held to recite nonstatutory subject matter under § 101 whereas dependent claim 6 was statutory.

5. A method of displaying data in a field comprising the steps of

calculating the difference between the local value of the data at a data point in the field and the average value of the data in a region of the field which surrounds said point for each point in said field, and displaying the value of said difference as a signed gray scale at a point in a picture which corresponds to said data point.

6. The method of claim 5 wherein said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner.

Step 1 Claim 5 contains a mathematical algorithm, "calculating the difference," which is defined in the specification as a Gaussian weighting function.

Step 2 When claim 5 is viewed without the mathematical algorithm, the only remaining limitation is the post-solution activity of displaying the result. The display by itself did not constitute an "otherwise statutory" process. The court held that "the algorithm is neither explicitly nor implicitly applied to any certain process." 684 F.2d at 909, 214 USPQ at 688. However, when dependent claim 6 is added to the limitations of claim 5, 684 F.2d at 908, 214 USPQ at 687-88:

Were we to view the claim absent the algorithm, the production, detection and display steps would still be present and would result in a conventional CAT-scan process. . . . [W]e view the production, detection, and display steps as manifestly statutory subject matter and are not swayed from this conclusion by the presence of an algorithm in the claimed method.

III. Computer Programs

A. "Computer programs" versus "computer processes"

A "process" or "algorithm" is a step-by-step procedure to arrive at a given result. In the patent area, a "computer

process" or "computer algorithm" is a process, i.e., a series of steps, which is performed by a computer. A "[computer] program is a sequence of coded instructions for a digital computer." *Benson*, 409 U.S. at 65, 175 USPQ at 674. Computer programs are equivalently known as "software."

Unfortunately for discussion in this area, "[b]oth the series of steps performed by a computer, and the software directing those steps, have acquired the name 'computer programs.'" *Gelnovatch*, 595 F.2d at 45 n.5, 201 USPQ at 148 n.5 (Markey, C.J., dissenting). What is sought to be protected by patent is the underlying process. As stated in *Gelnovatch*, 595 F.2d at 44, 201 USPQ at 147:

Confusion may be avoided if it be realized that what is at issue is not the "program," i.e., the software, but the process steps which the software directs the computer to perform.

See, e.g., *Maucorps*, 609 F.2d at 483, 203 USPQ at 814 ("The [claimed] invention is implemented via a computer program written in FORTRAN IV, either built into the calculating machine, or loaded into a general purpose computer").

B. Statutory nature of computer processes

1. The Supreme Court has not ruled on the patentability of computer programs.

The Supreme Court has not ruled on whether computer processes are *per se* statutory or nonstatutory. The decisions in *Benson*, *Flook* and *Diehr* all dealt with claims viewed as mathematical algorithms. In *Benson* and *Diehr*, the claims contained mathematical algorithms implemented by a computer. In *Benson*, the Court held that the claims preempted the use of the mathematical algorithm, but did not hold that "any program servicing a computer" would be nonstatutory. In *Diehr*, the Court held that the claims otherwise defined a statutory process for curing rubber, and that the inclusion of a mathematical algorithm or computer program did not make claim nonstatutory. The claim in *Flook* did not involve a computer process.

In *Dann v. Johnston*, 425 U.S. 219, 189 USPQ 257 (1976), *rev'g on other grounds*, *In re Johnston*, 502 F.2d 765, 183 USPQ 172 (CCPA 1974), which involved a "machine system for automatic record-keeping of bank checks and deposits," the Court declined to discuss the § 101 issue of the general patentability of computer programs, 425 U.S. at 220, 189 USPQ at 258:

We find no need to treat that question in this case, however, because we conclude that in any event respondent's system is unpatentable on grounds of obviousness. 35 U.S.C. § 103.

In *Diamond v. Bradley*, an equally divided Supreme Court affirmed the CCPA's decision in *Bradley*. The claims were directed to computer "firmware," which refers to microinstructions permanently embodied in hardware elements, and not to a computer application or process. The CCPA found that the claims literally recited a machine and that, in applying the two-part test of *Freeman*, the claims did not recite a mathematical algorithm.

2. The CCPA has held that computer processes are statutory unless they fall within a judicially determined exemption

In *Pardo*, the most recent CCPA case on computer processes, the CCPA stated that, 684 F.2d at 916, 214 USPQ at 677:

any process, machine, manufacture, or composition of matter constitutes statutory subject matter unless it falls within a judicially determined exception to section 101.

The major (and perhaps only) exception in the area of computer processes is the mathematical algorithm. Although not binding precedent on the Federal Circuit, the district court in *Paine*,

Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce, Fenner & Smith, 564 F. Supp. 1358, 1367, 218 USPQ 212, 218 (D. Del. 1983) stated:

The CCPA [has] . . . held that a computer algorithm, as opposed to a mathematical algorithm, is patentable subject matter.

If a computer process claim does not contain a mathematical algorithm in the *Benson* sense, the second step of the *Freeman-Walter-Abele* test is not reached, and the claimed subject matter will usually be statutory.

The traditional approach by the CCPA to the PTO's rejection of computer processes as nonstatutory subject matter has been to apply the two-part test for mathematical algorithms and to find statutory subject matter if the claims do not recite a mathematical algorithm. See *Pardo*, 684 F.2d at 916, 214 USPQ at 676 (process for converting source program into object program: "we are unable to find any mathematical formula, calculation, or algorithm either directly or indirectly recited in the claimed steps of examining, compiling, storing, and executing"); *In re Toma*, 575 F.2d 872, 877, 197 USPQ 852, 856 (CCPA 1978) (process for translating a source natural language, e.g., Russian, to a target natural language, e.g., English: "[we] are unable to find any direct or indirect recitation of a procedure for solving a mathematical problem"); *In re Phillips*, 608 F.2d 879, 883, 203 USPQ 971, 975 (CCPA 1979) (process for preparing architectural specifications: "Our analysis of the claims on appeal reveals no recitation, directly or indirectly, of an algorithm in the *Benson* and *Flook* sense"); *Freeman*, 573 F.2d at 1246, 197 USPQ at 471 ("The method claims here at issue do not recite process steps which are themselves mathematical calculations, formulae, or equations"); *Deutsch*, 553 F.2d 689, 692, 193 USPQ 645, 648 (CCPA 1977) (method of operating a system of manufacturing plants: "Nothing in the methods claimed by Deutsch preempts a mathematical formula, an algorithm, or any specific computer program"); *Chatfield*, 545 F.2d at 158, 191 USPQ at 736 (method of reassigning priorities within a computer: "[the] independent claims contain neither a mathematical formula nor a mathematical algorithm").

If the computer process is found to contain a mathematical algorithm, it must then pass the second part of the *Freeman-Walter-Abele* test for statutory subject matter. See, e.g., *Sherwood*; *Maucorps*; *Gelnovatch*.

Arguably, other exceptions such as "methods of doing business" and "mental steps" may be raised if a claim is not a true computer process, but merely recites that an otherwise nonstatutory process is performed on a computer. *de Castelet*, 562 F.2d at 1244, 195 USPQ at 447 ("Claims to nonstatutory processes do not automatically and invariably become patentable upon incorporation of reference to apparatus"). These would appear to be exceptions with very narrow application to claims which are not limited to implementation by a machine. For example, while a "method of doing business" *per se* is not statutory subject matter, "a method of operation on a computer to effectuate a business activity" has been held to be statutory subject matter. *Paine, Webber v. Merrill Lynch*, 564 F. Supp. at 1369, 218 USPQ at 220. See also *Deutsch*, 553 F.2d at 692 n.5, 193 USPQ at 648 n.5 (claims were not a method of doing business because "[t]hey do not merely facilitate business dealings"); *Johnston, rev'd on other grounds*, *Dann v. Johnston* (apparatus claims directed to system for automatic record-keeping of bank checks and deposits did not cover a method of doing business). Similarly, machine or computer implementation of "mental steps" is statutory subject matter. *Prater*; *In re Bernhart*, 417 F.2d 1395, 163 USPQ 611 (CCPA 1969); *In re Musgrave*, 431 F.2d 882, 167 USPQ 280 (CCPA 1970). See also *Toma* (computer implemented method for translation of natural languages is statutory).

Chronological Order Case List

In re Prater, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969)
In re Bernhart, 417 F.2d 1395, 163 USPQ 611 (CCPA 1969)
In re Musgrave, 431 F.2d 882, 167 USPQ 280 (CCPA 1970)
Gottschalk v. Benson, 409 U.S. 63, 175 USPQ 673 (1972)
In re Christensen, 478 F.2d 1392, 178 USPQ 35 (CCPA 1973)

Dann v. Johnston, 425 U.S. 219, 189 USPQ 257 (1976), *rev'g* on other grounds, *In re Johnston*, 502 F.2d 765, 183 USPQ 172 (CCPA 1974)

In re Noll, 545 F.2d 141, 191 USPQ 721 (CCPA 1976), *cert. denied*, 434 U.S. 875, 195 USPQ 465 (1977)

In re Chatfield, 545 F.2d 152, 191 USPQ 730 (CCPA 1976), *cert. denied*, 434 U.S. 875, 195 USPQ 465 (1977)

In re Deutsch, 553 F.2d 689, 193 USPQ 645 (CCPA 1977)

In re Waldbaum, 559 F.2d 611, 194 USPQ 465 (CCPA 1977)

In re Richman, 563 F.2d 1026, 195 USPQ 340 (CCPA 1977)

In re de Casteler, 562 F.2d 1236, 195 USPQ 439 (CCPA 1977)

In re Freeman, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978)

In re Toma, 575 F.2d 872, 197 USPQ 852 (CCPA 1978)

Parker v. Flook, 437 U.S. 584, 198 USPQ 193 (1978)

In re Sarkar, 588 F.2d 1330, 200 USPQ 132 (CCPA 1978)

Hirschfeld v. Banner, 462 F. Supp. 135, 200 USPQ 276 (D.D.C.

1978), *aff'd without opinion*, 615 F.2d 1368 (D.C. Cir. 1980),

cert. denied, 450 U.S. 994, 210 USPQ 776 (1981)

In re Gelinovatch, 595 F.2d 32, 201 USPQ 136 (CCPA

1979)

In re Manacorps, 609 F.2d 481, 203 USPQ 812 (CCPA

1979)

In re Phillips, 608 F.2d 879, 203 USPQ 971 (CCPA

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In re Sherwood, 613 F.2d 809, 204 USPQ 537 (CCPA 1980),

cert. denied, 450 U.S. 994, 210 USPQ 776

(1981)

In re Walter, 618 F.2d 758, 205 USPQ 397 (CCPA

1980)

Arshal v. United States, 621 F.2d 421, 208 USPQ 397

(Cl. Cl. 1980), *cert. denied*, 449 U.S. 1077 (1981),

reh'g denied, 450 U.S. 1050 (1981)

Diamond v. Diehr, 450 U.S. 175, 209 USPQ 1 (1981)

Diamond v. Bradley, 450 U.S. 381, 209 USPQ 97 (1981),

aff'g by an equally divided Court, In re Bradley, 600 F.2d

807, 202 USPQ 480 (CCPA 1979)

In re Pardo, 684 F.2d 912, 214 USPQ 673 (CCPA 1982)

In re Taner, 681 F.2d 787, 214 USPQ 678 (CCPA 1982)

In re Abele, 684 F.2d 902, 214 USPQ 682 (CCPA 1982)

In re Meyer, 688 F.2d 789, 215 USPQ 193 (CCPA 1982)

Paine, Webber, Jackson & Curtis, Inc. v. Merrill Lynch, Pierce,

Fenner & Smith, 564 F. Supp. 1358, 218 USPQ 212 (D.

Del. 1983)

Safe Flight Instrument Corp. v. Sundstrand Data Control, Inc.,

706 F. Supp. 1146, 10 USPQ2d 1733 (D. Del. 1989)

APPENDIX C

EUROPEAN PATENT OFFICE

TRILATERAL COOPERATION

EPO - JPO - USPTO

Munich, September 1989

**PATENTABILITY OF COMPUTER RELATED
INVENTIONS**

(Project 12.5)

COMPARATIVE STUDY

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O. Summary

Neither the US law nor the JP law even mention computer-related inventions. Only in the EPC, programs for computers are explicitly mentioned in a list of subject-matter which in particular shall not be regarded as inventions. However, based on a long tradition both the US examination manual and the JP examination standards define certain subject-matter as being excluded from patentability.

It would appear that the concepts of patentable inventions, including those which are computer-related, are not fundamentally different from each other. The basic patentability criterion, namely the technical character of an invention considered as a whole, appears to be commonly accepted. The tests or methods used to assess patentability appear to lead, in spite of their different approach, to substantially the same results as can be seen from the typical cases and examples.

As regards the disclosure requirements it appears to be commonly accepted that program listings alone ("working models" of a program) are not sufficient for disclosure of an invention while functional block diagrams and

flow charts are accepted or even required. There are differences in certain other aspects.

The USPTO as well as the JPO require that hardware and software must be fully disclosed, if programs are involved, in the form of flow charts. The USPTO requires in such cases also program listings. The USPTO defines the "skilled in the art standard" as comprising knowledge in the programming art as well as in the hardware technologies.

The EPO does not require full disclosure of programs as such but only of the technical concept behind the program; the skilled person is deemed not to be a programming specialist. However, short excerpts of programs in a commonly known programming language are accepted. As to printing of program listings there are different restrictions in all three office practices.

I. Legal bases concerning patentability of computer-related inventions.

1. 35 U.S.C. 101

Whoever invents or discovers any new and useful process, machine, manufacture or composition of matter or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

JP Law 2.-(1) and 29.-(1)

Invention in this law means the highly advanced creation of technical ideas by which a law of nature is utilised.

Any person who has made an invention which is industrially applicable may obtain a patent therefor.

EPC, Article 52(1) (2) (3)

(1) European patents shall be granted for any inventions which are susceptible of industrial application, which are new and which involve an inventive step.

(2) The following in particular shall not be regarded as inventions within the meaning of paragraph 1:

- (a) discoveries, scientific theories and mathematical methods;
- (b) aesthetic creations;
- (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;

(d) presentations of information.

(3) The provisions of paragraph 2 shall exclude patentability of the subject-matter or activities referred to in that provision only to the extent to which a European patent application or a European patent relates to such subject-matter or activities as such.

2. It is noted that the US law as well as the JP law comprise a relatively concrete positive definition of what is meant by invention, while the EP law is only concrete in listing "non-inventions".

Neither the US law nor the JP law even mention computer-related inventions.

Only in the EPC programs for computers are explicitly mentioned in a list of subject-matter and activities which "in particular shall not be regarded as inventions".

However, as regards the USPTO and the JPO, the provisions in the laws have been interpreted by many decisions of courts and the long tradition is reflected in the examination manuals and standards. For the EPO the situation is different since there is not yet a long tradition of decisions. But actually, the Examination Guidelines are in substance confirmed by the decisions of the Boards of Appeal so far.

II. Basic criteria and tests used in assessing patentability of computer-related inventions.

A. Basic criteria

3. In the US MPEP (Manual of Patent Examination Procedure) it is made clear that
 - an invention must be in the technological arts;
 - no distinction exists between computer-related inventions and any other statutory subject-matter;
 - the examining approach for a claim involving a computer program, algorithm or the like is the same as for any other type of invention;
 - subject-matter otherwise statutory does not become non-statutory simply because it uses a computer program;
 - the presence of a mathematical algorithm within the claim of a software invention does not automatically mean that the claim is non-patentable subject-matter.
4. On the other hand the US MPEP draws a line between statutory and non-statutory subject-matter when stating that
 - a claim seeking coverage for a computer program would be non-statutory when, considered as whole, it merely recites a mathematic algorithm or a method of calculation which is not applied in any manner to physical elements or process steps;
 - certain computer program related claims may be non-statutory as falling within judicially determined exceptions outside the mathematics area, such as:

- - printed matter,
- - naturally occurring article
- - method of doing business
- - scientific principle;
- it has been long held that
- - scientific principles,
- - mathematic formulas,
- - mathematical algorithms,
- - laws of nature are not patentable.

5. The JP Examination Standard comprises the following statements:

- a product or process invention must be a highly advanced creation of technical ideas by which law of nature is utilised;
- the eligibility for invention of the subject-matter relating to computer program is determined as to whether the procedure implemented by computer program is regarded as a creation of technical idea utilizing laws of nature;
- if the subject-matter relating to microcomputer applied technology is regarded as an apparatus comprising means for implementing specific functions provided by microcomputer, said subject-matter is eligible for apparatus invention;
- in determining the patentability of computer-related inventions no distinction is made as to whether a data processing operation is implemented by means of a computer program or by means of special circuitry;

6. According to the JP Examination Standard the following subject-matter is not patentable:

.../...

- programming language (which is man made rules for the purpose of describing programs),
- data to be dealt with by computer (which merely express various phenomena, e.g. social or natural phenomena, with combinations of figures or symbols),
- documents as such (they are merely the permanent records which can be read by man or machine),
- law of nature itself,
- subject-matter utilising laws other than laws of nature (e.g. economical laws or laws of social phenomena) like a method for doing business,
- subject-matter utilising mental activities (reasoning or memorising) like a calculation method using mathematical formula derived from mathematical activities or an advertising method to attract public attention,
- subject-matter contradictory to laws of nature like a perpetuum mobile.

7. The EP Guidelines for Substantive Examination start from a different situation since the EP law excludes programs for computer as such from patentability.

It is explained that

- the list of things in the law which shall not be regarded as inventions is non-exhaustive;

- an invention must be of both a concrete and a technical character;
- the concept of technical character implies that a patentable invention must relate to a technical field, must be concerned with a technical problem and must be characterised in the claims by means of technical features;
- as soon as the claimed subject-matter, considered as a whole, makes a technical contribution to the art (i.e. a contribution which goes beyond pure programming art or pure scientific theories and so on) it is not excluded from patentability, irrespective of whether a computer program plays a role in the claimed subject-matter;
- all the above basic patentability considerations (which are separate and distinct from the questions regarding the criteria of industrial applicability, novelty and inventive step) are in principle valid for computer-related inventions as well as for any other things and activities like those listed in Article 52(2), EPC.

8. To summarise the above it can be stated:
Neither the US law nor the JP law excludes computer-related inventions from patentability. However, in the US examination manual as well as in the JP examination standard it is made clear that computer-related inventions, as well as other subject-matter, may be non-patentable if they, considered as a whole, reside principally in a

non-patentable area or fall within judicially determined exceptions. The EP law on the other hand, does exclude, among other subject-matter, programs for computers as such from patentability, but the EP Examination Guidelines make clear that the basic criterion for patentability is the technical character of the invention, considered as a whole, irrespective of whether a computer program is involved.

9. From the above it appears that, in spite of the different wording of the laws and the different ways of arguing in the guidelines, the concepts of patentable inventions in the three offices are not fundamentally different from each other.

The basic patentability criterion, namely the technical character of an invention, considered as a whole, appears to be accepted in all three offices.

Or in a negative sense, the exclusions made by law or in the guidelines seem to correspond to each other in their essence; all of them seem to be based on lack of technical character.

B. Tests used

10. All three offices apply the general rule, that claims for computer-related inventions, as any other inventions, must be considered as a whole when determining patentability.

11. USPTO. When examining computer-related inventions the Freeman-Walter test is used:
1st step: determine whether a scientific principle, law of nature, or idea, which may be represented by a mathematical algorithm is either directly or indirectly recited in the claim;
2nd step: determine whether the claim as a whole would wholly preempt others from using the algorithm in its entirety,
if yes, then the claim is non-statutory!
12. JPO. The following steps are applied to determine eligibility of computer-related inventions:
1st step: determine whether the subject-matter substantially relates to computer software; if no, apply the general standard!
If yes, next step!
2nd step: determine whether the subject-matter is deemed to be a computer applied apparatus invention in the specific technical field (i.e. the software and the specific hardware are combined with each other);
if yes, eligible!
If no, next step!
3rd step: Determine whether the software utilises the specific character or structure of hardware resources;

If yes, eligible!

If no, next step!

4th step: determine whether the procedure
implemented by computer software is
creation of a technical idea
utilising laws of nature;
if yes, eligible!
If no, non-eligible!

13. EPO. The following main rules for assessing patentability of computer-related inventions are applied:
- (i) A computer program claimed by itself or as a record on a carrier is not patentable, irrespective of its content.
 - (ii) The situation is not normally changed when the computer program is loaded into a known computer.
 - (iii) If, however, the subject-matter, considered as a whole, makes a technical contribution to the known art, patentability should not be denied merely on the ground that a computer program is involved in its implementation.
 - (iv) Where subject-matter claimed is only concerned with the program-controlled internal working of a known computer, there might be a patentable contribution to the art, if a technical effect can be identified. All the technical features

of the invention which are essential for said technical effect must be included in the claim.

- (v) Where patentability is admitted, then, generally speaking, product, process and use claims would be allowable.

14. The above tests or methods to assess patentability are not directly comparable. The US test stresses particularly the question of non-protectability of mathematical algorithms. It does not really deal with the question of technical character of a computer-related invention which appears to be the case in the JP test and the EP main rules. In other words, the Freeman-Walter test alone would not be sufficient to assess patentability. It is rather suitable to determine cases which would lead to unallowable protection of mathematical algorithms as such. In addition to that it would be necessary to examine whether the subject-matter claimed falls within the judicially determined exceptions as mentioned above in paragraph 4. The JP test and the EP main rules, however, would appear to lead substantially to the same results.

III./IV. Actual practice in typical cases and representative examples.

15. (1) A computer program as such (set of instructions claimed by itself or as record on a carrier or when loaded into a known computer).

USPTO

Would be rejected on two grounds:

- computer language listing of instructions would be viewed as a mere idea or abstract intellectual concept, which is non-statutory subject-matter,
- it would be seen as a collection of printed-matter, which is non-statutory subject-matter.

These grounds appear to have nothing to do with the Freeman-Walter test but are considered as resulting from interpretation of non-statutory subject-matter as listed in paragraph 4 above in the light of the relatively concrete definition of inventions in the law.

JPO

Is not deemed to be patentable since it is neither an apparatus invention nor a process invention, but something abstract.

This reasoning appears to result from applying the JP test.

EPO

Is not patentable according to Article 52 (2) and (3), EPC and corresponding to main rules i) and ii).

16. (2) A method or process of operating a computer in accordance with a given program.

USPTO

Would normally be patentable under the proviso that the Freeman-Walter test allows it. As a positive example a claim to a compiler program is mentioned; In re Pardo, 684 F. 2d 912 (CCPA 1982).

JPO

Would be patentable, provided that a given program utilises the specific character or structure of hardware resources (see JP test 3rd step) or that the claimed procedure implemented by a computer program is regarded as a creation of technical idea utilising laws of nature (JP test 4th step).

EPO

Would be patentable if a technical effect can be identified and the technical features which are essential for this effect are defined in the claim, in accordance with main rules iv) and v).

Generally speaking, these are cases where an operating system makes a known computer work in a different way. Compiler programs would normally be considered as being part of the operating system.

17. (3) A known computer if programmed to operate in a given way.

USPTO

Would normally be patentable under the proviso that the Freeman-Walter test allows it.

As an example is quoted, In re Abele, 214, U.S.P.Q. 682 (CCPA 1982), a case, the claims of which are directed to (5) method of displaying data... comprising the steps of calculating... and to (6) same method wherein said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner.

The fifth claim was found non-statutory since it did not pass the Freeman-Walter test whilst the sixth claim was accepted since it was viewed that the X-ray attenuation data limitation caused the claim to be directed to an application of the algorithm with a computed tomography scanner. This data could only be produced by a CAT scanner, therefore the claim was found statutory.

JPO

Would be patentable if JP test 3rd step or 4th step is passed.

As a positive example a claim is suggested which is deemed to define a functionally expressed apparatus.

EPO

Is considered patentable provided a technical effect is identified as in case (2), according to main rules iv) and v).

EP-B-63186 would appear to belong to this sort of case. It is directed to a data processing system which allows for the efficient use of

an indefinite number of known computers in a system.

18. (4) A program-controlled manufacturing or control process.

USPTO

Would be patentable provided the Freeman-Walter test allows it.

In Diamond v Diehr (450 U.S. 175, 209 U.S.P.Q. 1 (1981)) the claim was directed to a method of operating a rubber-molding press..., comprising:

- providing said computer with a data base for said press...
- repetitively calculating in the computer...
- repetitively comparing in the computer...
- opening the press automatically when said comparison indicates equivalence.

The Court ruled that the mathematical algorithm was not preempted because the claim was directed to the application of the algorithm in determining when to automatically open a rubber forming mold. The claim was ruled statutory.

JPO

Would normally be accepted since JP test 4th step would result in yes.

The Japanese application corresponding to the US Diehr case resulted in a patent since step 4 resulted in yes.

EPO

Is patentable according to main rule iii). As an example EP-B-1640 can be taken which is

directed to a computer controlled x-ray equipment.

19. (5) An article of manufacture comprising a microprocessor or memory wherein a computer program is stored to carry out a specific function.

USPTO

An article of manufacture comprising a microprocessor or memory having a stored computer program is treated the same as any other invention. Whether there is patentable subject-matter is determined by applying the two step Freeman-Walter test 1). Consequently, known microprocessors or memories per se having different programs stored therein would not be viewed as patentably distinct from other prior art memory devices, since they would fail to pass the Freeman-Walter test, i.e. the stored algorithms do not define structure between physical elements. However, if the microprocessor is new and nonobvious, the entire claim would constitute patentable subject-matter.

JPO

Unless the article of manufacture means a known carrier as such (or a known computer as a recorded media) storing computer program therein, it would pass the second step of the JPO test, and would be patentable.

EPO

It is considered patentable for reasons analogous to those valid in case (4), it being understood that "article of manufacture" does not mean a known computer or a known carrier per se.

- 1) (1) Does the claim directly or indirectly recite an algorithm? If yes, then: (2) Is the algorithm implemented in a specific manner to define structural relationship between physical elements of the claim (in an apparatus claim) or to refine or limit claim steps (in a process claim)? If the answer to the second question is yes, then the claim is not considered an algorithm or a computer program, and from that standpoint, is directed to patentable subject-matter.

As an example EP-A-160 833 can be considered which is directed to an individual discrimination card ... which includes a memory ... and a microprocessor

20. (6) If any of the above subject-matter in cases (1) to (5) is allowable, might it nevertheless be excluded?

USPTO

A claim could be considered which passed the Freeman-Walter test, but was found non-statutory because it is directed to a method of doing business, mental steps per se, scientific theories or acts of nature.

EPO

Subject-matter which is not considered a computer program as such might nevertheless be excluded from patent protection, if there is no inventive contribution in a field not excluded from patentability under Article 52(2)(c), EPC.

JPO

Subject-matter not utilizing laws of nature as a whole, is excluded from patent protection²⁾.

21. To summarise the result of the above typical cases (1) to (5) it is first of all to be stated that substantially the same results are achieved in cases (1) through (4), although with the proviso that certain requirements are fulfilled. However, these requirements do in principle correspond in spite of the different wording.

As regards case (5) the preconditions and restrictions formulated seem to be based on different arguments. However, in real cases, the results would probably correspond. Case (6) hints at those fields which are excluded from patentability by law as for the EPO or as defined in the US examination manual and in the JP examination standard respectively.

- ²⁾ For example, the following is excluded.
- (1) Laws of nature itself.
 - (2) The subject-matter utilizing laws other than laws of nature.
 - (3) The subject-matter essentially utilizing mental activity.
 - (4) The subject-matter contradictory to laws of nature.

V. Disclosure requirements

(1) General requirements in respect of a
sufficient disclosure

22. USPTO: Relevant provisions are comprised in 37 U.S.C. 112, first and second paragraph and in the corresponding implementing regulations, 37 CFR Sections 1.71 and 1.75. However, these provisions do not explicitly mention computer-related inventions. The "undue experimentation test" applies as a general rule.

The implementing regulations 37 CFR 1.96 and 1.58(a) regulate printing of program listings and flow charts.

JPO: Relevant provisions are comprised in the Patent Law, Sections 70, 36(3)-36(5). All these provisions are of general importance and do not make a distinction as to whether a subject-matter is a computer-related invention or not.

EPO: Relevant provisions are found in Articles 83, 84 and 14 of the EPC and in Rules 27 and 29 of the implementing regulations. They do not explicitly mention computer-related inventions.

(2)/(3) Requirement of a detailed description,
disclosure and printing of program listings

23. USPTO: In the MPEP, Sections 2106.01 and 2106.2 there are many passages which deal with the requirements for computer-related

inventions. These passages which concern the detailed description of computer-related inventions are summarised as follows:

(a) General requirements

- . The requirements for sufficient disclosure of computer-related inventions are the same as for all inventions. Functional block diagrams for computer systems are accepted and sometimes even preferred, provided the structure is conventional and can be determined without undue experimentation.
- . In computer cases hardware as well as software (due to their interrelationship and interdependence) must be disclosed.
- . In regard to the "skilled in the art standard" the knowledge of persons skilled in the programming art as well as in the hardware technologies is the appropriate criterion.
- . If, for inventions involving a program, the disclosure fails to include either the program itself or a reasonably detailed flow chart and if more than routine experimentation would be required of one skilled in the art to generate such a program the sufficiency of disclosure would be challenged.
- . The precise method to disclose a program, i.e. whether in source code and/or flow charts, depends on the subject-matter and the nature of the program. However, a "working model" of a program is generally not required.

.../...

(b) Sufficiency of disclosure by program listings

- . A "working model" of a program alone is not a written description of the invention and will not be admitted. It is not an adequate disclosure since it could require more than routine experimentation to decipher the binary code.

(c) Printing of program listings in the specification

According to 37 CFR 1.96 and 1.58(a) the following applies:

- . All submitted computer program listings on ten printout pages or less must be printed as part of either the specification or the drawings.
- . A program listing eleven or more pages long, however, may be provided in an appendix that will not be printed if it is submitted in microfiche form.
- . The program listing may be in object or source code.
- . Whenever flow charts are provided in lieu of a program listing, they must be submitted as formal drawings since flow charts are not permitted in the specification.

24. JPO: In the Examination Standard concerning the specification the requirements for sufficient disclosure of inventions are not differentiated for particular technical

fields. Computer-related inventions are not explicitly mentioned.

However, according to the actual practice the following applies:

(a) General requirements

- . A functional description is allowed only when it is clear for a skilled person how the functions are realised. Otherwise detailed structures must be described.
- . In a computer related invention, a functional block diagram corresponding to the means for implementing specific functions is required for an apparatus invention, and a flow chart corresponding to the detailed procedure is required for a process invention.
- . In addition in a working example hardware and software must be fully described.
- . In the case of a process invention it must be made clear how the process is implemented by software.
- . In the case of computer applied apparatus inventions the hardware must be disclosed so that the combination of apparatus elements is clear. The software must be explained by using flow charts, but not by a program list.

(b) Sufficiency of disclosure by program listings

- . Description of an invention only by a program listing is not regarded to satisfy the requirements as a rule.
- . A flow chart is required in sufficient detail.

(c) Printing of program listings in the specification

.../...

- A program listing may be submitted as a reference material. If it is wanted to be part of the specification it should be described as a table.
25. EPO: In principle the same requirements are to be satisfied for computer-related inventions as for any other subject-matter. The Guidelines for Examination require in addition for computer-related inventions the following:
- (a) General requirements
 - In complex cases such as computer-related inventions it is considered necessary that the invention be described not only in terms of its structure but also in terms of its function, unless this is immediately apparent.
 - In the particular case of inventions in the computer field the description as in other technical fields, should be written substantially in normal language, possibly accompanied by flow diagrams or other aids to understanding, so that the invention may be understood by those skilled in the art who are deemed not to be programming specialists.
 - (b) Sufficiency of disclosure by program listings
 - Program listings are not required. They cannot be relied on as sole disclosure of the invention since the skilled person is deemed not be a programming specialist.
 - However, short excerpts from programs written in commonly used programming

languages can be accepted, if they serve to illustrate an embodiment of the invention.

(c) Printing of program listings in the specification

If complete program listings are comprised in the originally filed documents they will be published as part of the patent application.

However, in the course of the examining procedure it will be decided whether or to which extent such listings will be part of the patent specification.

(4) Necessary features of admissible claims

26. USPTO: The provisions for claims for computer-related inventions are in principle the same as for any other inventions. Generally speaking, the claims must not be functional, incomplete, prolix, or merely recite an aggregation or odd combination.
- . Claims of a computer-related invention have been deemed invalid for want of an enabling disclosure when the system claimed could, at the time of filing of the application, be carried out only by (1) obtaining access to a computer program held by the owner as a trade secret subject to licensing, or (2) writing a suitable program with the estimated expenditure of 1.5 man years of work.

27. JPO: The provisions for claims for computer-related inventions are in principle the same as for any other inventions.
- . In a computer applied apparatus invention the combination of the computer means with each other as well as with the other elements making up the computer applied apparatus must be recited.
 - . It may be allowed in complex cases to describe said means as a series of statements defining the manner in which the functions are achieved.
 - . Storage means having specific contents may be recited only if it has a certain connection to the above mentioned combination of means.
 - . Any purpose or effect of the invention as well as contents of a program should not be recited in place of the above mentioned means.
 - . In a process invention the procedure implemented by computer software should be expressed clearly.
28. EPO: The claims must be drafted in terms of the technical features of the invention.
- . In computer-related cases where patentability depends on a technical effect the claims must be so drafted as to include all the technical features which are essential for the technical effect.

APPENDIX D

Computer Related¹Works Registered FY 1986 to Present

	TX ²	TXu ³	PA ⁴	PAu	VA ⁵	VAu	Total
FY 1986							
1st Quarter	1290	1035	12	5	0	0	2342
2nd Quarter	1646	1136	17	1	0	0	2800
3rd Quarter	1467	1347	63	2	1	0	2880
4th Quarter	1162	1226	44	2	0	0	2434
						Total	10456
FY 1987							
1st Quarter	1403	1245	17	3	0	0	2668
2nd Quarter	1306	1026	26	4	0	0	2362
3rd Quarter	1271	886	35	3	0	0	2195
4th Quarter	1157	1276	39	5	4	3	2484
						Total	9709
FY 1988	989	1664	16	3	1	3	2676
1st Quarter	1379	1508	20	2	1	2	2912
2nd Quarter	1705	1252	15	0	0	0	2972
3rd Quarter	1051	1622	26	4	0	0	2703
4th Quarter							
						Total	11263
FY 1989							
1st Quarter	1046	1327	23	1	2	1	2400
2nd Quarter	937	1256	11	3	1	1	2209
3rd Quarter	1208	1215	28	2	2	7	2462
4th Quarter	1206	1614	29	4	0	1	2854
						Total	9925

¹Machine readable works, including computer programs, printouts, digitally encoded magnetic tapes, and punch cards.

²Literary works, including computer programs and databases.

³The letter "u" after a class means that the work is unpublished.

⁴Works of the performing arts, including audiovisual works.

⁵Works of the visual arts.

Computer Related Works Registered FY 1986 to Present

	TX	TXu	PA	PAu	VA	VAu	Total
FY 1990							
1st Quarter	1135	1233	20	1	1	0	2390
2nd Quarter	1769	882	27	0	0	2	2680
3rd Quarter	1360	1892	23	1	2	0	3278
4th Quarter	1086	1207	15	0	2	1	2311
						Total	10659
FY 1991							
1st Quarter	1148	1674	12	2	2	1	2839
2nd Quarter	1293	2845	27	2	4	5	4176
						Total	7015
						Grand Total	59027