98TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPORT
98-781

SEMICONDUCTOR CHIP PROTECTION ACT OF 1984

MAY 15, 1984.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following

REPORT

[To accompany H.R. 5525]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 5525) to amend title 17, United States Code, to protect mask works of semiconductor chips against unauthorized duplication, and for other purposes, having considered the same, report, by voice vote, a quorum being present, no objection being heard, favorably thereon with amendments and recommend that the bill as amended do pass.

The amendments are shown in the reported bill, with the matter proposed to be stricken shown in linetype and the matter proposed to be inserted shown in italic type.

PURPOSE OF THE LEGISLATION

The purpose of the legislation is to protect semiconductor chip products in such a manner as to reward creativity, encourage innovation, research and investment in the semiconductor industry, prevent piracy, while at the same time protecting the public.

BACKGROUND

In about 500 B.C., the Greek philospher Heraclitus observed that "nothing endures but change." More recently, a noted legal historian has noted: "Change is one of the few things men can be certain of." [1] The proof of these statements is their truth today. In our age, however, technology has accelerated the pace of change far beyond

[1] W. Hurst, *The Growth of American Law: The Law Makers* 19 (1950).

what anyone might have dreamed. It is easy to forget that the movie industry is only about seventy years old; the television industry is reaching its fourth decade; and the semiconductor industry is in comparison a mere infant.[2] The information society—no longer an idea, but reality today—had its origins in 1956-1959.[3]

Integrated circuits, better known as semiconductor chips, have revolutionized our entire way of life. Semiconductor chips are used to operate microwave ovens, cash registers, personal and business computers, TV sets, refrigerators, hi-fi equipment, automobile engine controls, automatic machine tools, robots, printing presses, cardiac monitors and pacemakers, X-ray imaging and scanning equipment, blood testing equipment, word processors and printers, telephones, and many other medical, consumer, business, and industrial products. New and better uses for chips are emerging regularly and society is rewarded with a corresponding enhancement of life. More than perhaps any other invention, the semiconductor chip has brought us into the information age.

The fundamental shift from an industrial to an informational society is no longer just a prediction but is a reality. The majority of the American workforce is engaged not in the production of goods but in the creation, processing and distribution of information. Expanding information technology, from computers to satellites, from television to teletype, ensures that we will become even more of an information society in the future. The semiconductor chip is at the vortex of this new society.

A semiconductor chip is typically much smaller than a fingernail. Yet a single chip may contain over 100,000 transistors photographically etched and deposited on a silicon wafer.[4] Fitting these transistors into that small space, placing them so that the resulting device operates efficiently and economically, is a fine art and also a costly one. The layout/design process and the preparation of the photographic "mask" used to etch, deposit layers on, and otherwise process the chip often take the innovating chip firm years, consume thousands of hours of engineer and technician time, and cost millions of dollars. The development costs for a single new chip can reach $100 million.

NATURE OF THE PROBLEM

A competing firm can photograph a chip and its layers, and in several months and for a cost of less than $50,000 duplicate the mask work of the innovating firm. Because the copyist firm does not have the enormous costs borne by the innovator, such a firm can undersell the innovating firm and flood the market with cheap copies of the semiconductor chip. In an industry in which innovation is absolutely essential, such appropriation of creativity is a

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[2] The first semiconductor chip was invented in 1959 simultaneously by Jack Kilby and Robert Noyce; the microprocessor chip was invented in 1971 by Ted Hoff. See generally T. Wolf, The Tinkering of Robert Noyce, Esquire (December 1983) at 346.

For further information about the role of law and societal change, see Hearings on Copyright and Technolgical Change Before the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice, 98th Cong., 1st sess. (1983) [hereinafter referred to as House Hearings on Copyright and Technological Change].

[3] J. Naisbitt, *Megatrends* 11 (1982).

[4] For an excellent article on the chip. see "Electronic Mini-Marvel That Is Changing Your Life: The Chip", National Geographic, Vol. 162, No. 4 (October 1982) at 421.

devastating disincentive to innovating research and development. The prices charged by an innovating firm necessarily must reflect the research and development costs of the innovating chip. Once returns on investment have been choked off by the unfair competition of competing firms which do not bear the tremendous research and development costs, the incentive for innovating firms to set aside internal funds for the development of future generations of semiconductor products is severely limited. Moreover, the disincentive effect reaches other firms who learn a lesson from the misfortune of others. Such copying is a clear threat to the economic health of the semiconductor industry. This, of course, has a ripple effect throughout the country's economy, with the impact becoming ever more critical as we continue an accelerated transition to a high-tech society.

To allow the continuation of present practice may make it increasingly difficult for the semiconductor industry to continue to invest in development of new chips.

Parenthetically, U.S. semiconductor products compete successfully on international markets precisely because they are, on the whole, the best and most innovative products available.[5] U.S. semiconductor manufacturers have achieved this because they have long stressed the development of innovative products and have utilized pricing structures enabling that development to take place.[6]

Unless changes in the law occur, conferring some protection on semiconductor chip products, the industrial leadership enjoyed in the past by the American semiconductor industry may vanish. Ultimately, the continued viability of the information society may be threatened.

Current intellectual property law offers innovating chip firms only limited protection against the misappropriation of their technology. The current copyright, patent and trademark laws give little, if any, protection to semiconductor chips.[7] Patent law can protect the basic electronic circuitry for new microprocessors or other new such products. But patent law does not protect the particular layouts and design work preformed by the different chip manufacturers in adapting those electronic circuits for a particular industrial purpose, because the creativity involved does not rise to the inventive level required by the patent laws. Yet, it is those layouts and design works that consume the resources of the innovating firms and that are copied by free riders.[8] Copyright law has

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[5] The economic state of an industry, and pricing mechanisms that might be used in lieu of legislation, are important policy subjects for Congress. Here, a finding that an industry has done well in the past without legislative protection does not mean that threats to present and future investments fall outside Congressional concern.

[6] Historically, semiconductor chip prices decline 28 to 30 percent each time total output doubles. Noyce, "Microelectronics" in *Microelectronics* (W. H. Freemen & Co.) 2, 7–8 (1977).

[7] See Hearings on Copyright Protection for Semiconductor Chips Before the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice, 98th Cong., 1st sess. (1983) [hereinafter referred to as House Hearings (1983)] (statements of Hon. Don Edwards, Hon. Norman Y. Mineta, and Hon. Charles McC. Mathias).

[8] As aptly observed by the Commissioner of Patents and Trademarks: "Patent protection is available for the process of making the chip, for the electronic circuit embodied in the chip itself as an article of manufacture, provided that the process or the circuit or the article of manufacture meets the patentability requirements of being new, useful and unobvious. While a patent on the circuit would protect against the manufacture, use or sale of the circuit, the circuits in chips are usually well-known and therefore unpatentable. Patents for the process of making the chip or for the chip itself as an article of manufacture would not ordinarily protect against a taking of the design." Id. at 17 (Statement of Gerald J. Mossinghoff).

always considered a mask work to be purely utilitarian, and therefore outside the scope of copyright protection.

Morever, as the Copyright Office has observed:

> * * * copyright does not protect useful articles per se; copyright protects the design of a useful article only to the extent that artistic features can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article copyright in a drawing or other representation of a useful article does not protect against unauthorized duplication of the useful article; and copyright protects only expression—not ideas, plans, or processess. (Footnotes deleted.) [9]

Current law needs to be changed to help innovating firms combat unfair chip copying. It needs to be changed to allow innovating firms the necessary incentive to continue to invest in research and development, by protecting them against the piracy of the results of that research and development. Most importantly, it needs to be changed to enable the public to benefit from the labors of creators. It is abundantly clear to the Committee that the best way to change current law is by adding a new, freestanding and unitary chapter 9 to title 17 of the United States Code. Protection of semiconductor chip products by a sui generis approach, rather than through extension of the Copyright Act to admittedly utilitarian objects, carries with it a number of benefits in addition to providing requisite protection. These benefits shall be set forth below under separate discussions of the Congressional role, international ramifications, and sui generis versus copyright protection.

THE CONGRESSIONAL ROLE

It is clearly within the power of Congress to modify or amend this nation's intellectual property laws. Article I, Section 8 of the Constitution provides that:

> The Congress shall have Power * * * to Promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

The monoply privileges that Congress may confer " * * * are neither unlimited nor primarily designed to provide a special private benefit. Rather, the limited grant is a means by which an important public purpose may be achieved." *Sony Corp.* v. *Universal City Studios, Inc.*, 104 S. Ct. 774 (1984); *accord, United States* v. *Masonite Corp.*, 316 U.S. 265, 278 (1942) (same as to patents).

The congressional role therefore—as is made very clear in the text of the Constitution—is to define the scope of the limited monopoly that should be granted a creator in order to give the public appropriate access to a creation. Balancing between the rights of the creator and the needs of the public clearly is necessary. In fact, where changes have occurred and new technologies have been developed, Congress consistently has engaged in precisely such a balancing approach.

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[9] Id. at 85–86 (Statement of Dorothy Schrader).

When creating new intellectual property rights or in expanding old rights, legislators must therefore weigh the relative equities between the rights of the property holders and the interests of the public. Where technological changes have occurred, and those changes have had an impact on the lives of millions of people (as is the case for semiconductor chips), Congress must be extremely careful that its approach be reasonable and workable.

In so doing, it is important to keep in mind the following admonition:

> * * * Copyright is an amalgam of property law principles bent to the service of a rather simple bargain. A limited term of protection against copying is granted to an author's original expression in exchange for the dedication of that expression to the public domain at the end of the term. The public ordinarily benefits at least twice from this bargain: once, when the original expression is first created, and then again when the expression is added to the public domain from which anyone may borrow freely to fashion new works. Although a copyright belongs to an author during its term, the ultimate purpose of this bargain is not to protect authors but rather to enrich the public domain. The cardinal principle in copyright law, then, is that any decision to extend the law or to recognize new interests ought to be based on a realistic expectation that one day the public domain will bear new fruit.[10]

The "Semiconductor Chip Protection Act of 1984," which of course does recognize new interests, is grounded in the expectation that one day the public domain will bear mature fruit. Further, H.R. 5525 navigates the sometimes troubled waters between "* * * the interests of authors and inventors in the control and exploitation of their writings and discoveries on the one hand, and society's competing interest in the free flow of ideas, information, and commerce on the other hand," *Sony Corp.* v. *Universal City Studios, Inc.*, supra 104 S. Ct. at 782.

SUI GENERIS VERSUS COPYRIGHT APPROACH

Congress, in exercising its constitutional authority to solve problems discussed above, is faced with a choice between two approaches: copyright protection or sui generis protection. In the opinion of the Committee (without dissent), protection for mask works should be granted apart form the Copyright Act; H.R. 5525 therefore creates a new form of legal protection separate from and independent of the Copyright Act, as contained in Chapters 1 through 8 of title 17 of the United States Code. In reaching this conclusion, the Committee gave careful consideration to the relative merits of protecting mask works under copyright.[11]

From a Congressional perspective, the unique problems posed by the need to reward creativity, encourage innovation, research and

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[10] See Hearings on Copyright and Technological Change, supra note 2, at 60 (statement of Professor David Lange).

[11] Both H.R. 1028, 98th Cong., 1st sess. (1983), and S. 1201, 98th Cong., 1st sess. (1983), protect mask works under copyright.

investment in the semiconductor industry while at the same time protecting the interests of the public has called for unique solutions. The approach taken in H.R. 5525, the creation of a sui generis from of protection, reflects the Committee's judgment that such an approach is uniquely suited to the protection of mask works, which represent a form of industrial intellectual property. This is to be contrasted with the so-called "author's copyright" in literary and artistic works protected under traditional copyright principles. The Committee is aware that copyright has expanded to encompass new forms of protection, many of which have commercial applications. The commercial application or character of a given copyrighted work, however, presents a far different case from that of mask works, which are intended to be and are used as part of an integral part of a manufacturing process. This manufacturing purpose and use is, in fact, the reason for the Copyright Office's refusal to accept chip products for deposit as "copies" of "pictorial graphic or sculptural works" under the Copyright Act.[12]

The Committee's position is perhaps best expressed by the following statement of Professor L. Ray Patterson (Emory University School of Law):

> The ultimate issue is the problem of integrity in the law of copyright. By integrity, I mean consistency in the principles which the law encompasses. While consistency for its own sake is a virtue of small consequence, consistent principles for a body of law are essential for integrity in the interpretation and administration of that law.
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> The conclusions to which I have come are two: (1) It would be unwise for Congress to provide copyright protection for semiconductor chips by amendment to the present statute. The basis for this conclusion is that the present copyright statute purports to provide for an author's copyright. (2) The appropriate solution to the problem of protection for semiconductor chips is the creation of an industrial copyright, separate and distinct from the author's copyright.[13]

Stated somewhat differently, a mask work is not a book. The proposed legislation does not engage in the legal "fiction" of treating books and mask works similarly. It does not suffer from the "fallacy of analogy" referred to by Judge Stephen Breyer in his remarks to the recent Congressional Copyright and Technology Symposium.[14]

There is no reason for believing that a sui generis approach will provide any less encouragement or stability within the field of semiconductor chip design, since the essential attributes of H.R. 5525 (e.g., ten-year term of protection, limitations on innocent in-

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[12] See *Intel Corp.* v. *Ringer* (C 77-2848 N.D. Cal. 1978, voluntary dismissal of complaint). See discussion at notes 20–21, infra, and accompanying text.

[13] See Hearings (1983), supra note 7, at 54. See also written statements of Professor Robert C. Denicola, Professor Alan Latman, Professor John Kidwell, and Michael A. Lechter, Esq., supra note 7.

[14] See also Summary or Rapporteur (Paul Goldstein, Professor of Law, Stanford Law School), Proceedings of Congressional Copyright and Technology Symposium, 4-6 February 1984, Fort Lauderdale, Florida. As observed by Judge Breyer: "The analogy that grips Congress' attention will be the one that controls it."

fringers, and a reverse engineering right) are identical or substantially similar to those contained in bills conferring protection under copyright.

The creation of a sui generis form of protection for mask works represents, in the Committee's view, appropriate recognition of the industrial nature of mask work design and avoids conceptual confusion in copyright law to accommodate a form of intellectual property which is better protected by reference to the background and practices of the semiconductor industry.

The arguments asserted in favor of a copyright approach may be summarized in two points: first, the copyright route might allow international protection of mask works under the existing copyright conventions, the Universal Copyright Convention (hereinafter referred to as UCC) to which the United States adheres and the Berne Convention, which we have not joined; and, second, a nearly 200-year body of legal precedents could be tapped to provide more certainty regarding the scope of mask work protection.

International Considerations.—With respect to international protection, the Committee believes that the interest of the United States in establishing a reasonable system of domestic protection for mask works is paramount, especially since the possibility of international protection under the copyright conventions is speculative. There are technical problems in fitting mask work protection under the Universal Copyright Convention—questions concerning what constitutes a "copy," questions concerning publication and its relationship to any requirement of notice of copyright, and questions about whether mask works could be treated as photographs or works of applied art in order to justify the ten year term of protection (since the UCC ordinarily requires a minimum 25-year term). No country has protected mask works under the UCC to date. There is no assurance that any other country would agree with the United States that the functional features of a semiconductor chip can be protected under copyright.

If the United States enacts copyright legislation to protect mask works, we would be required to give equivalent protection under the UCC; arguably we could stand thereafter alone in the obligation to protect works first published in UCC countries or created by UCC nationals. The United States could be required to protect, for example, the mask works of Japan, West Germany, and the Soviet Union, and receive no protection in return. This is required by application of the principle of "national treatment," the fundamental principle of the UCC.[15] A reading of the clear language of the UCC[16] allows the conclusion that the United States could retaliate if other nations refused to protect mask works, although we have never exercised this option previously. Moreover, specific legislation authorizing retaliation would be required;[17] there is not a

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[15] See Article II (1), UCC.

[16] See Article IV (4), UCC.

[17] The UCC is not a self-executing treaty. See Article X. See also Wasserstrom, "Some Reflections on Article VII, IX, XV, and XX of the Universal Copyright Convention," in *Universal Copyright Convention Analyzed* (Kupferman dnd Foner, New York, 1955) at 63, 67. See also Ringer and Flacks, "Applicability of the Universal Copyright Convention to Certain Works in the Public Domain in their Country of Origin," 27 Bull. Cr. Soc. 157, 199 (1980). Section 104 of 17 U.S.C. would have to be amended.

single bill pending in the 98th Congress that confers copyright protection on mask works and provides for retaliation.

Accordingly, the Committee concludes that the UCC does not now obligate member countries to protect mask works, and this bill does not attempt to meet the requirements of the UCC. Possibly international protection could be sought through bilateral arrangements (and eventually through a new or revised treaty) that would assure United States nationals of substantially the same amount of mask work protection in foreign countries as the United States grants to foreign nationals. It also is possible that the UCC, or another multilateral treaty, could be amended.

The Committee also believed it important that the Act should be consistent with the General Agreement on Tariffs and Trade (GATT). Therefore, H.R. 5525 treats foreign and domestic infringers on a completely equal basis. Moreover, H.R. 5525 affords full reciprocity to foreign owners of mask works and allows them to secure protection under this Act if their country allows such protection to U.S. owners of mask works.[18]

Copyright Law.—In considering whether the copyright system could provide the best form of domestic protection for mask works, the Committee notes that the present copyright law does not protect useful articles, as such, and semiconductor chip products are useful articles, as defined in the Copyright Act. 17 U.S.C. 101 (definitions of "pictorial, graphic or sculptural works" and "useful article"). Moreover, while masks containing technical information and schematic drawings of chip layouts have been registered under the Copyright Act as technical drawings, the fundamental principle codified in 17 U.S.C. 113 has meant that any protection as a "technical drawing" does not protect the copyright owner of the drawing with respect to unauthorized duplication of the finished useful article represented by the drawing.[19] No court has held that duplication of a semiconductor chip violates any rights in the registered technical drawing.[20] Under 17 U.S.C. 113, no other conclusion seems likely.

The prohibition against copyright in useful articles is a fundamental principle of our copyright laws, adhered to for the nearly 200 years of their existence. In philosophical terms, the prohibition rests on the distinction between protection for expression and nonprotection for ideas under copyright, and on the differences in scope, standards, term, and purpose of the patent and copyright systems. In pragmatic terms, the nonprotection of useful articles that do not meet the patent standards of novelty and invention represents a societal judgment that the public benefits from rela-

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[18] In point of fact, the Office of the Trade Representative, through the White House Cabinet Council on Commerce and Trade, requested a drafting change in section 4(b)(2) of H.R. 5525 to insure fully equal treatment for foreign and domestic manufacturers. This technical change was made.

[19] See *Muller* v. *Triborough Bridge Authority*, 43 F. Supp. 298. 300 (S.D.N.Y.) 1942) (bridge not protected copyright in by drawing); *Jack Adelman, Inc.* v. *Sonners & Gordon, Inc.*, 112 F. Supp. 187, 190 (S.D.N.Y. 1934) (Same for dress design not protected); *Supplemental Report of the Register of Copyrights on the General Revision of the U.S. Copyright Law: 1967 Revision Bill, Copyright Law Revision Part 6*, 47–48 (1965).

[20] *Intel Corp.* v. *Ringer*, C 77–2848 (N.D. Cal., October 10, 1978) sought judicial reversal of the Copyright Office's refusal to register a claim to copyright in a chip product or design based on the contention that the chip is the published copy of a technical drawing. The case was withdrawn by the plaintiff without prejudice.

tively unhampered imitative copying of non-novel useful articles, unless the conduct is so predatory that it should be curtailed by unfair competition, or perhaps trade secrecy, laws. Other countries have established design protection laws, based on modified copyright and patent principles, to fill some of the gap between copyright and patent protection for designs applied to useful articles. The Congress has rejected this course to date.

The artistic features of useful articles can be protected under copyright provided that such features can be identified separately and are capable of independent existence as a work of art, part from the overall shape of the useful article. 17 U.S.C. 101 (definition of "pictorial, graphic, or sculptural work"); *Mazer* v. *Stein,* 347 U.S. 201 (1954) (Balinese dancer sculpture used as a base for lamp).[21] The overall shape of a useful article has not been protected by copyright, no matter how unique or attractive the design concept. *Esquire, Inc.* v. *Ringer,* 591 F.2d 796 (D.C. Cir. 1978), cert. denied, 440 U.S. 908 (1979) (outdoor lighting fixture not copyrightable); *Eltra Corp.* v. *Ringer,* 579 F.2d 294 (4th Cir. 1978) (typeface design not copyrightable); *Norris Industries* v. *I.T. & T. Corp. and Ladd,* 696 F.2d 918 (11th Cir. 1983), cert. denied, U.S. , October 3, 1983 (design for automobile wire wheel not copyrightable).

A 1979 bill, H.R. 1007 (96th Congress, First session), would have protected designs for semiconductor chips as works of art even though the designs are not separable from and are not independent of the utilitarian aspects. Yet the designs for semiconductor chip products are purely functional features. H.R. 5525 protects the functional aspects of chip design, provided the particular design is neither dictated by a particular electronic function nor is one of only a few available design choices that will accomplish that function.

Notwithstanding the essentially utilitarian nature of chips, at least two bills pending in the 98th Congress place mask works within the mainstream of copyright law.[22] These bills attempt to solve the useful article issues, (1) by creating a new, separate category of copyrightable subject matter ("mask works"), which purportedly would not be subject to the useful article line of copyright cases; and (2) by avoiding use of the term "copy" as applied to semiconductor chips in order to obviate application of the principle of 17 U.S.C. 113. Thus, these bills apply to chip products the provisions of copyright law that apply to "copies", in nine specified enu-

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[21] The current Copyright Act's definition of "pictorial, graphic, or sculptural work" essentially codified Copyright Office regulations interpretive of the copyright statutes. Before the Act of 1909, the copyright laws apparently prohibited copyright even in the artistic feature of useful articles; the Act of 1870, for example, used the restrictive term "works of the fine arts." In the 1909 Act, the qualifying term "fine" was dropped; "works of art" was established as a subject matter catetory. The first regulations of the Copyright Office (1910) interpreting the 1909 Act, prohibited registration for "[p]roductions of the industrial arts utilitarian in purpose and character . . . even if artistically made or ornamented." This regulation was superseded in 1948 by a rule defining "works of art" specifically to include "works of artistic craftsmanship, insofar as their form but not their utilitarian aspects are concerned. . . ." [Quoted with approval in *Mazer* v. *Stein,* 347 U.S. 201, 212-213 (1954).] After the *Mazer* decision, the regulation was revised in 1956 and 1959 to articulate more precisely the dividing line between protectable artistic features and nonprotectable aspects of a useful article. The 1959 regulation was codified in the current Act.

[22] See H.R. 1028, 96th Cong., 1st sess. (1983) and S. 1201, 96th Cong., 1st sess. (1983). The Committee, of course, has opted for the approach in H.R. 5525 which was a substitute amendment in subcommittee for H.R. 1028.

merated sections of the copyright law, and in no others. This approach—designed to avoid confusion—does not succeed.

The first solution might have been technically feasible, although significant questions arise about the impact of this approach on the principle of separation of artistic features from utilitarian aspects and the consequent dividing line between copyrightable and noncopyrightable features of useful articles.

The second solution raises serious technical questions. If semiconductor chip products are not copies per se, which these bills do not say they are, would publication of the chip product result in publication of the mask work embodied?[23] How would a mask work be published otherwise? (If the mask work is not capable of publication, the notice formality of the copyright law would not apply.) Would confusion arise concerning the status of computer programs and other works embodied in semiconductor chips? Further questions could be asked.

Mask works, although superficially similar in some respects to maps, technical drawings, photographs, or audiovisual works, are in fact very dissimilar in function and nature of creativity. Maps are not useful articles within the meaning of copyright law since they merely convey information. Technical drawings are protected for their drawing aspects and information content, but protection has not extended to manufacture or sale of the useful article portrayed. Photographs and audiovisual works are protected for their visual, aesthetic appeal. They have no intrinsic purpose other than to portray their own appearance. Accordingly, photographs and audiovisual works are not useful articles under copyright law, even if they are used for training or educational purposes, for example. By contrast, mask works would be protected on the basis of the technical and creative skill employed in laying out or designing electronic circuitry. Mask works have no intrinsic aesthetic purpose. Even if the layouts convey information, that is not their sole or main purpose: their primary purpose is to be used in the manufacture of a useful article—semiconductor chip products.

The Committee decided that the formidable philosophical, constitutional, legal and technical problems associated with any attempt to place protection for mask works or semiconductor chip designs under the copyright law could be avoided entirely by creating a sui generis form of protection, apart from and independent of the copyright laws. This new form of legal protection would avoid the possible distortion of the copyright law and would establish a more appropriate and efficacious form of protection for mask works. Rather than risk confusion and uncertainty in, and distortion of, existing copyright law as a result of attempting to modify fundamental copyright principles to suit the unusual nature of chip design, the Committee concludes that a new body of statutory and decisional law should be developed. It should be specifically applicable to mask works alone, and could be based on many copyright principles, and other intellectual property concepts; it could draw by analogy on this statutory and case law framework to the extent clearly applicable to mask works and semiconductor chip protec-

[23] Section 101 of title 17, which defines "publication" is not one of the nine sections included.

tion, but should not be restricted by the limitations of existing copyright law.

TECHNOLOGICAL BACKGROUND

The following discussion provides necessary information about the technology of the semiconductor industry. Any inquiry about copyright and technological change must, of course, start with a basic understanding of technological breadth and pace of change, before turning to the mechanism of protection.[24]

1. THE SEMICONDUCTOR CHIP

A semiconductor material is an element or compound that has the capacity to partially conduct electricity. As its name implies a semiconductor is intermediary between conductors, which fully conduct electricity, and insulators, which do not appreciably conduct electricity. The semiconductor material most often used today is silicon; others are germanium and gallium arsenide.

The "chip" nicknamed for the integrated circuit, at its simplest is electronic circuitry. A complex of miniscule switches are patterned on the chips' silicon base. These switches, which control the electric current, are joined by "wires" etched from extremely thin films of metal. "Under a microscope the chip's intricate terrain looks uncannily like the streets, plazas, and buildings of a great metropolis, viewed from miles up." [25]

Chips are collections of transistors formed on a single ("integrated") structure which work together to perform assigned electronic functions. The latest generation of chips on the market contain 250,000 transistors which are compacted on an area of silicon wafer a quarter inch square. By way of comparison, 5,000 transistors operate a digital watch; 20,000 are used for a pocket calculator; and 100,000 are necessary for a relatively small computer. Today's chips of 250,000 transistors have more computing power, compute faster, consume far less power, are more reliable, and sell at a fraction of the cost than mainframe computers of the early 1970s.[26]

The most advanced semiconductor chips can be broadly classified into two categories: microprocessors and memories. The microprocessor, referred to as a "computer on a chip," has logic circuits capable of electronically performing various information processing functions. It serves as the brains of many of today's electronic equipment. On the other hand, a memory is a semiconductor chip which simply stores certain data. This data could be data upon which the microprocessor will operate. It could also be the output of the microprocessor (that is, data which the microprocessor has already operated on and needs to be saved for future computations). Of course, the functions of a microprocessor and a memory can be integrated on the same semiconductor chip.[27]

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[24] See House Hearings on Copyright and Technological Change, supra, note 2 (statement of Fred W. Weingarten).

[25] National Geographic, supra, note 4, at 421.

[26] See House Hearings (1983), supra, note 7, at 23 (statement of F. Thomas Dunlap, Jr.).

[27] Id.

2. CHIPS AND THEIR CREATION

Several distinct marketing and creative stages are involved in bringing a new semiconductor chip to the market.

At the outset, since a substantial economic investment is required, a market study must be conducted to determine the functions which potential customers would like performed. Physical and electrical characteristics can be preliminarily defined at this early stage.

Once the functions of a chip are defined, it is the job of a circuit design engineer to develop circuits to implement these electronic functions. The circuit engineer develops a circuit by making a "schematic" representation of the manner in which transistors must be connected to implement the appropriate electronic function. Often 20 sheets of paper will be used to draw the entire schematic of a complex chip. The circuit schematic is a paper document and is not useful until it is fabricated on a chip. Next comes the arduous stage of layout determination. A layout design engineer must take the circuit schematic and layout patterns which can be imprinted onto a wafer to form a chip. The goal of the layout process is to decide upon a three-dimensional layout that is composed of a predetermined set of building blocks. The layout must be done in a timely manner so that the final chip can be available in the marketplace when it was needed. More importantly, the layout must be very compact to minimize the cost of the chip. The smaller the chip *(the less "silicon real estate" it uses),* the more chips which can be put on a single wafer and consequently, the better chance that the wafer will yield more good chips. Trial and error is used to select the optimum layout. Unsurprisingly, the layout stage is time-consuming and extremely costly.[28]

The layout determination process is followed by the actual manufacturing process.

3. MANUFACTURE OF THE SEMICONDUCTOR CHIP

The basic building block of a chip is a transistor, or electronic switch, that controls and amplifies electrical signals. These transistors are connected, or integrated, to form a particular circuit which performs a desired function.

Transistors and chips are formed on a thin semiconductor substrate (typically silicon) which is known as a "wafer." Typically, it is a five-inch diameter disk approximately .025 inches thick. Hundreds of chips will be made at one time by processing a wafer. The wafer will be subjected to certain chemical, photographic, and heat treatments.

The manufacture or fabrication of a chip is as follows:

Semiconductor chip products are most frequently manufactured by a process known as "photolithography" or "masking." After the two and three dimensional features of shape and configuration of a chip have been determined, the layout (or "topography") of the chip can be fixed in pictorial form—a so-called "composite" drawing of the various layers of the chip, shown in different colors on a very large sheet of paper. The same information can be recorded in

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[28] Id.

digital form, by storing all the relevant coordinates of points in the composite drawing in a computer tape known as a "data base tape."

This information is then used to generate a series of "masks," which are stencils used to manufacture chips. Chips are manufactured by etching material (or otherwise removing it) away from semiconductor wafers and depositing material (or otherwise placing it) on the wafers. The etching and depositing processes configure the chips to the patterns comprising the mask work protected by this Act. The masks are used to control the etching and depositing processes.

The following steps exemplify the use of masks to configure into silicon the patterns of a mask work. A silicon wafer is coated with a layer of silicon dioxide, which (unlike silicon itself) is soluble in hydrofluoric acid. The silicon dioxide layer is then covered with a thin film of natural or synthetic rubber, known as "resist," because it resists the action of acid. Over the wafer is then placed a stencil, which typcially is a glass mask having opaque and transparent regions that correspond to one of the patterns of the mask work. Ultraviolet light is then cast on the mask. The radiation passes through the transparent parts of the mask but is blocked by the opaque parts. Where the ultraviolet light contacts the resist, the rubber is polymerized or "hardened" and becomes relatively insoluble in organic solvents. As a result, when next the wafer is washed in a solvent, the unhardened parts of the rubber film are dissolved away, while the hardened parts remain, leaving the mask pattern laid out in "resist" on the surface of the wafer. The wafer is then placed in hydrofluoric acid, which dissolves away the silicon dioxide that is not protected by resist. The resist is then removed, and a hill and valley pattern has been etched into the wafer.

The manufacture of a chip usually involves eight to twelve masking steps as described above. Each step uses a different mask. After completion of all masking steps, the originally unconfigured pure silicon wafer has been converted into several hundred chips laid out side by side like postage stamps on a sheet. Typically, each chip is less than ¼ x ¼ inch in size. The chips are multiple layer "sandwiches" of pure silicon, silicon dioxide, and aluminum; and in some places the silicon has been mixed with phosphorous, boron, arsenic, and similar "dopants" which change the electrical conductivity of silicon. (The hundred thousand or more transitors on the face of a chip are each made up of regions of varying conductivity, due to an excess or deficiency of electrons, which effect is caused by the dopants.) The chips are then sawed apart and are wired into ceramic or plastic packages for use in electronic equipment.[29]

The mask work—protected by H.R. 5525—is the two-dimensional and three-dimensional features of shapes, pattern and configuration of the surface of the layers of a semiconductor chip product. In other words, the mask work essentially is the layout determination

[29] More detailed descriptions of semiconductor chip manufacture are found in National Geographic, supra, note 4, at 426-427, 432-34; *Microelectronics*, W. H. Freeman & Co., supra, note 6. See also House Hearings, supra, note 7 (Statements of F. Thomas Dunlap, Jr., and Dorothy Schrader).

and the sum total of the individual masks, set upon each other, used to fabricate the entire chip.

H.R. 5525 is drafted flexibly so as not to freeze into place existing technologies. Semiconductor chip products are broadly defined as multi-layered products of metal, semiconductor, or insulating material on a semiconductor substrate. New technologies in the semiconductor field, such as those in the photolithography field, are covered by this legislation.

STATEMENT

During the 98th Congress, the Committee—acting through the Subcommittee on Courts, Civil Liberties and the Administration of Justice—held two days of hearings on the issue of copyright protection for semiconductor chips (H.R. 1028).[30]

On August 3, 1983, oral testimony was received from the bill's two chief sponsors (Honorable Don Edwards and Honorable Norman Y. Mineta); Jon Baumgarten, Esq. (on behalf of the Association of American Publishers, Inc.); and Thomas Dunlap, Jr., accompained by Richard Stern, Esq. (on behalf of the Semiconductor Industry Association). A written statement was submitted by the bill's chief sponsor in the Senate (Hon. Charles McC. Mathias).

On December 1, 1983, testimony was received from Professor L. Ray Patterson (School of Law, Emory University); Honorable Gerald J. Mossinghoff (Assistant Secretary of Commerce, Commissioner of Patents and Trademarks, and Chairman of the Working Group on Intellectual Property, Cabinet Council on Commerce and Trade, The White House); and Dorothy Schrader (Copyright Office of the United States).

In addition, the subcommittee solicited and received written statements from a number of qualified individuals and interested organizations, including Professor John Kidwell (School of Law, University of Wisconsin); Professor Alan Latman (School of Law, New York University); Professor Robert C. Denicola (College of Law, University of Nebraska); Michael Lechter, Esq. (Partner, Cushman, Darby & Cushman); the Association of Data Processing Service Organizations (ADAPSO); the American Patent Law Association (APLA); the American Electronics Association (AEA), and the Information Industries Association (IIA).

The subcommittee took note of the fact that during the 98th Congress one day of hearings was held on companion legislation before the Senate Judiciary Subcommittee on Patents, Copyrights and Trademarks.[31]

In addition, during the 96th Congress a further day of hearings was held on the issue of copyright protection for semiconductor chip products by the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice.[32] The legislative proposal introduced during the 96th Congress[33] was short and

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[30] See House Hearings (1983), supra note 7.

[31] See Hearings on the Semiconductor Chip Protection Act of 1983 befoe the Senate Judiciary Subcommittee on Patents, Copyrights and Trademarks, 98th Cong., 1st sess. (1983).

[32] See Hearings on Copyright Protection for Imprinted Design Patterns on Semiconductor Chips before the House Judiciary Subcommittee on Courts, Civil Liberties, and the Administration of Justice, 96th Cong., 1st Sess. (1979).

[33] H.R. 1007, 96th Cong., 1st sess. (1979).

simple. Consisting of only fourteen lines, the proposal would have added the following sentence to 17 U.S.C. § 101 (the definitional section for "Pictorial, graphic, and sculptural works"): "Such pictorial, graphic and sculptural works shall also include the photographic masks used to imprint patterns on integrated circuit chips and the imprinted patterns themselves even though they are used in connection with the manufacture of, or incorporated in a useful article."

Prior to the 1979 hearing, and continuing until today, the Copyright Office has never found mask works to fall within the category of "pictorial, graphic, and sculptural works." The rationale for this practice is found in 17 U.S.C. § 101, which clearly bars registration of the "mechanical and utilitarian aspects" of a pictorial, graphic, or sculptural work. Section 101 further requires that the design of a useful article (as defined in section 101) ". . . shall be considered a pictorial, graphic, and sculptural work *only* if, and *only* to the extent that, such design incoroprates pictorial, graphic, or sculptural features that can be identified *separately from,* and are capable of existing *independently of,* the utilitarian aspects of the article." (Emphasis added). No court has ordered otherwise and, therefore, mask works never have received copyright protection under the Copyright Act.[34]

The 1979 legislation was more controversial than expected within the semiconductor industry and among copyright experts. It failed to make legislative progress, and eventually disappeared as a viable proposal.

During the 98th Congress, after the completion of the hearing process, H.R. 1028 went to mark-up. On April 11, 1984, a quorum of subcommittee Members being present, the bill—as amended with a substitute amendment offered by Chairman Kastenmeier [35]—was reported in the form of a clean bill. On April 26, 1984, H.R. 5525 was introduced by Mr. Edwards; the bill was cosponsored by sixty-two Members of the House: Mr. Rodino, Mr. Mineta, Mr. Kastenmeier, Mr. AuCoin, Mr. Badham, Mr. Berman, Mr. Boehlert, Mr. Bosco, Mrs. Boxer, Mr. Brooks, Mr. Brown of California, Mr. Chandler, Mr. Chappie, Mr. Clinger, Mr. Conyers, Mr. DeWine, Mr. Erlenborn, Mr. Fazio, Ms. Fiedler, Mr. Fish, Mr. Frank, Mr. Gekas, Mr. Glickman, Mr. Hawkins, Mr. Hyde, Mr. Jeffords, Mrs. Johnson, Mr. Kindness, Mr. LaFalce, Mr. Lantos, Mr. Lehman of Florida, Mr. Levine of California, Mr. Lowery of California, Mr. Lujan, Mr. McCain, Mr. McCollum, Mr. Martinez, Mr. Mazzoli, Mr. Moorhead, Mr. Morrison of Connecticut, Mr. Mrazek, Mr. Murphy, Mr. Nelson of Florida, Mr. Olin, Mr. Owens, Mr. Panetta, Mr. Pritchard, Mr. Reid, Mr. Richardson, Mr. Ritter, Mr. Rudd, Mr. Sawyer, Mrs. Schneider, Mrs. Schroeder, Mr. Sensenbrenner, Mr. Robert F. Smith, Mr. Stark, Mr. Synar, Mr. Torres, Mr. Waxman, Mr. Wyden, and Mr. Zschau.

Since introduction eleven Members have been added as cosponsors: Mr. Barnard, Mr. Roybal, Mr. Wortley, Ms. Snowe, Mr. Ridge,

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[34] *Esquire, Inc.* v. *Ringer,* 591 F.2d 796 (D.C. Cir. 1978), cert. denied, 440 U.S.908 (1979); *Norris Industries* v. *I.T. & T. and Ladd,* 696 F.2d 918 (11th Cir. 1983), cert. denied, U.S. Oct. 3, 1983.

[35] The differences between H.R. 1028 and H.R. 5525 are explained in this report (see discus- Appendix A (chart of differences)).

Mr. Kogovsek, Mr. Lagomarsino, Mr. Lungren, Mr. Shaw, Mr. Mica, and Mr. McNulty.

A total of twenty-two Members of the full Committee have cosponsored the bill.

On May 1, 1984, the full Committee considered H.R. 5525, and after general debate, ordered the bill favorably by voice vote without dissent.

SECTION-BY-SECTION ANALYSIS

Section 1

Section 1 of the bill sets forth the bill's short title: "The Semiconductor Chip Protection Act of 1984."

Section 2

Section 2 amends title 17 of the United States Code by adding a new chapter 9 at the end thereof. The new chapter is not a part of the Copyright Act, chapters 1-8 of title 17. Instead, the new chapter creates a sui generis form of intellectual property right, similar in many respects to existing copyright law but differing from copyright law in various ways. Chapter 9 contains sections 901-912, analyzed below.

Section 901—Definitions

Section 901 adds to title 17 a number of new defined terms, which have special application to semiconductor chip products.

Semiconductor chip products.—Section 901(1) defines semiconductor chip product as a multi-layer product of metal, semiconductor, or insulating material on a semiconductor substrate. Semiconductor materials now in use include silicon, germanium, and gallium arsenide. However, the Act is not limited to present technology. Additional semiconductor products will also be covered by section 901(1)'s applicability to semiconductors in general. On the other hand, the Act is limited to what is generally understood as a semiconductor chip and does not extend to other kinds of product, such as magnetic films and printed circuit boards.[36]

Mask work.—Section 901(2) defines a mask work in terms of the two and three dimensional features of the geometry or "topography" of the semiconductor chip to which the work relates. The statutory provisions and case law doctrines of the copyright law excluding functional and utilitarian features of works from copyright protection (see 17 U.S.C. § 101; *Esquire, Inc.* v. *Ringer,* supra) are expressly made inapplicable to mask works by the language following "regardless" in section 901(2).

Fixation in a semiconductor chip product.—Section 901(3) defines initial fixation for a mask work in terms of production of an actual semiconductor chip product, not just a plan or drawing of one. This

[36] As originally introduced, H.R. 1028 had a further provision limiting the definition of the semiconductor chip products protected under the Act to those in or affecting commerce. H.R. 5525 is premised on a finding that original mask works are "writings" within the meaning of Article I, section 8, clause 8 of the Constitution. In the unlikely event that a court should find mask works not to be writings, authority for the legislation is found in the commerce clause, to the extent that the chip products and piratical conduct occur in or affect interstate commerce. In virtually all circumstances, this is clearly the case, and consequently a definitional section relating to interstate commerce is unnecessary.

type of fixation makes a mask work eligible for protection under section 902, infra. However, other kinds of fixation of mask works may be relevant for the purposes of other sections. For example, a mask work can also be fixed in a data base tape (a magnetic tape in which the coordinates of relevant points in a mask or set of masks is encoded in digital form). Fixation in a data base tape is one from which the mask work can be and typically is perceived, reproduced, and otherwise communicated. Thus, copying a tape fixation of this type falls within the reproduction right of section 905(1), infra. However, such fixation is not the kind of initial fixation of a mask work to which section 901(3) refers.

Originality.—Section 901(4) provides that a mask work is "original" if it is the independent creation of an author who did not copy it. This adopts the essence of the customary copyright law concept of originality and applies it to mask works, to the extent it is appropriate and feasible to do so.

Commercial exploitation.—Section 901(5) defines "commercial exploitation" of a mask work. This concept is relevant to determining the duration of mask work protection under section 904, infra, and the time within which a mask work must be registered under section 908, infra, to avoid forfeiture of all rights, and also to other provisions of the Act. Commercial exploitation includes sale of the semiconductor chip product or other distribution (as that concept is used in the Copyright Act) thereof to the public. The word "public" is intended to have a broad meaning, including but not limited to individuals, companies, retailers, commercial end users, non-profit corporations and organizations, and academic institutions. Commercial exploitation also includes offers to sell the semiconductor chip product, once the mask work has already been fixed in a semiconductor chip product. It does not include sales solicitations made before actual production of a commercial semiconductor chip; thus, an invitation to a potential customer to purchase a custom-made chip that is to be developed and produced for the customer's special applications or designed to the customer's specifications would neither start the two-year forfeiture provision running nor the ten-year life of rights under this Act.

Ownership.—Section 901(6) defines "owner" of a mask work to include the author, the legal representatives of a deceased author or one with a legal incapacity, an employer for whom the author created a work made within the scope of an employment relationship, or an assignee. This section's definition of ownership is similar to conventional copyright principles of ownership of a work.

Innocent purchaser.—Innocent purchasers—protected by section 907, infra—are defined in section 901(7) as persons who purchase a semiconductor chip product in good faith and without having notice of protection with respect to that particular chip product.

Notice of protection.—Section 901(8) defines "notice of protection" as having actual knowledge that, or reasonable grounds to believe that, a mask work fixed in a semiconductor chip product is protected under chapter 9 of title 17, United States Code.

Infringing semiconductor chip products.—Section 901(9) sets forth a definition of "infringing semiconductor chip product," which is such a product made, imported, or distributed in violation of the exclusive rights of the owner of a mask work. See sections 903

(ownership and transfer) and 905 (exclusive rights in mask works), infra.

Section 902—Subject matter of protection

Section 902(a) of the Act describes eligibility of authors for enjoyment of copyright in terms of treaty obligations and similar considerations. The provisions under which protection is granted under this Act generally parallels 17 U.S.C. § 104, with several modifications.

Section 902(a) provides that an original mask work fixed in a semiconductor chip product is eligible for protection if certain conditions are met: first, on the date that the mask work is registered or on the date on which the mask work is first commercially exploited, whichever occurs first, the owner of the mask work is a national or domiciliary of the United States, or is a national, domiciliary, or sovereign authority of a foreign country that is a party to a treaty affording protection to mask works to which the United States is also a party, or is a stateless person, wherever that person may be domiciled; second, the mask work is first commercially exploited in the United States; or third, the mask work falls within the scope of a Presidential proclamation issued under paragraph (2). Paragraph (2)(A) authorizes the President to issue proclamations conferring protection under this Act [37] upon a finding that a foreign nation extends protection to mask works of U.S. origin, on substantially the same basis as it protects mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation.

Subsection (2)(B) provides a further basis for the President to proclaim eligiblity of foreign mask work owners for protection under this chapter; namely, that reciprocal eligibility may be established even where the foreign state accords to its nationals a higher level of protection to mask works, so long as that accorded U.S. owners is "on substantially the same basis as provided in this chapter."

In any event, this becomes a matter for Presidential discretion on a nation-by-nation basis. It is the view of the Committee that this discretion should be carefully exercised.

The Committee is aware that the United States is taking a first step towards elaborating for mask works a system of protection which has international implications. The extent to which other states find our approach sensible, or absorb mask works into their organic copyright laws, must be carefully and sympathetically followed.

Further, the international political complexity of a number of multilateral agreements such as the UCC, Berne Convention, Paris Intellectual Property Convention, as opposed to the relatively simple bilateralism implicit in the Presidential proclamation process, must also be carefully monitored to ensure eventual international comity and harmony in this important area of trade.

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[37] Protection pursuant to Presidential proclamation is limited to: (1) mask work owners who are, on the date on which the mask works are registered under this Act., or the date on which the mask works are first commercially exploited, whichever occurs first, nationals, domiciliaries, or sovereign authorities of that nation; or (2) mask works which are first commercially exploited in that nation.

The Committee urges responsible officials of the legislative and executive branches to consider these legal and policy questions carefully, to inform regularly the Committee of significant developments at the international level, and be in a position to respond to a review of the operations of this law in its international aspects at a future date.

Section 902(b) provides that protection shall not be available for a mask work that is not original or consists of designs that are staple, commonplace, or familiar in the semiconductor industry, or variations of such designs, combined in a way that is not original. It is the view of the Committee that it is appropriate to require some minimum of creativity to qualify a mask work for protection under the Act. At the same time, the Committee desired to prevent public domain material from being usurped and turned into proprietary rights. There is a fundamental congressional policy against "recapturing" works in the public domain; this legislation pays careful heed to that policy. Accordingly, section 902(b)(2) prevents mere staple and commonplace designs from being taken out of the public domain. On the other hand, the Committee recognizes that all chip designs consist of arcs, lines, rectangles, and like staple designs; in a new chip these staple designs are arranged in an original particular way. The key to section 902(b)(2)'s protection of the public against usurpation of the public domain is the final phrase, "combined in a way that is not original." To be eligible for protection, the combination of arcs, lines and rectangles in a mask work must be original (and, of course, the combination must owe its origin to the alleged author). If staple, familiar, or commonplace elements are combined in a way that is not original, the resulting mask work is not protectable under this Act. The subject matter of the mask work must be original, when considered as a whole, even though, if the individual elements of the mask work were dissected away from the whole they might appear familiar or commonplace. A patentable combination, by contrast, must also be inventive, i.e., not obvious. For example, the new combination may be required to produce novel, startling and unexpected results. This Act does not so require for chips.[38]

Section 902(c) distinguishes the subject matter of the Semiconductor Chip Protection Act from the subject matter of the patent laws. In this regard, section 902(c) parallels section 102(b) of the Copyright Act.

Section 903—Ownership and transfer

Section 903 concerns ownership and transfer of proprietary rights in mask works. Subsection (a) vests in the owner of a mask work the exclusive rights described in section 905. Subsection (b) permits transfer of all or part of the rights under this Act in a mask work and gives ownership rights in a mask work the same attributes as other forms of personal property. This subsection is generally similar to 17 U.S.C. § 201 and 35 U.S.C. § 261 and, like those sections, merely permits rights to be transferred without af-

[38] This provision does not mandate an examination system for chips like that provided for patent applications. See discussion of § 908(e), infra. In the event of mask work infringement litigation, failure to satisfy the requirements of § 902(b) would be a defense.

fecting the applicability of other relevant laws to the transfer (e.g., state contract law, the antitrust laws). Subsection (c) is generally similar to 17 U.S.C. § 105, and excludes from protection any mask works created by government employees as part of their official duties.

Section 904—Duration

Section 904(a) begins protection under the Act on the date of registration of the mask work or the date of first commercial exploitation, whichever occurs earlier. Section 904(b) continues the term of such protection for ten years after the date on which protection begins.

Section 905—Exclusive Rights

Section 905 describes the exclusive rights enjoyed by the owner of a mask work.

Reproduction.—First, section 905(1) creates a reproduction right, generally similar to that of 17 U.S.C. § 106(1). The owner of a mask work under this Act has the exclusive right to reproduce the work in any way, including any manufacturing method. Complete reproduction of a mask work is not required in order to constitute an infringement of the owner's exclusive right of reproduction. Unless a valid defense is presented, a judge or jury could find an infringement if the mask work embodied in the "copied" semiconductor chip is substantially similar to the registered mask work. If this was otherwise, an infringer could immunize himself by adding a mistake to a mask work copied in its entirety. Difficult fact finding responsibilities are commonly assigned to Federal judges and juries in our justice system, and the Committee is confident that these individuals will successfully implement the judicial components of this Act.[39] Optical means, such as conventional mask lithograpy, are the most common means for reproducing a mask work in a semiconductor chip product; optical means are also most typically the means for reproducing the work in the form of the masks used in mask lithography to manufacture semiconductor chip products. However, electronic means of reproduction are also in use at this time. For example, a mask work can be stored in a data base tape, so that the coordinates of various points in the semiconductor chip product are recorded. The mask work can then be reproduced in a semiconductor chip, in a mask, or in another tape by means of the data base tape. The tape can be utilized, also, in conjunction with a computer and computer program, to drive an electron gun that directly etches patterns in the semiconductor chip product, or to drive a light beam that polymerizes "resist" on the surface of the chip during the manufacturing process so that a pattern can then be etched onto the surface. The language of paragraph (1) is intended to include all of these and any other means of reproducing mask works.

Importation and distribution.—Paragraph (2) creates an exclusive importation and distribution right; this paragraph is similar to 17 U.S.C. §§ 106(3) and 602(a).

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[39] For further analysis of "substantial similarity," see discussion of section 910, infra.

Contributory infringement.—Paragraph (3) makes contributory infringement of the reproduction, distribution, and importation rights an act of infringement. Such a provision has no statutory analogue in the Copyright Act. Paragraph (3) does follow, however, a contributory infringement standard described generally in *Sony Corp.* v. *Universal City Studios*, 104 S. Ct. 774 (1984), and *Aro Mfg. Co.* v. *Convertible Top Replacement Co.*, 377 U.S. 476 (1964).[40]

Section 906—Reverse engineering, first sale

Reverse engineering.—Section 906(a) immunizes from liability under this Act reproduction of the mask work for the purpose of teaching, analyzing, or evaluating the concepts or techniques embodied in the mask work or the circuitry or organization of components used in the mask work.

This section thus codifies the established industry practice of "reverse enginering." It is therefore permissible for a competitor to reproduce a mask work by photographing the semiconductor chip product and studying and analyzing the photograph, in order to create another semiconductor chip product that competes with the first one.[41] A number of witnesses testified as to the practice in the semiconductor industry of reverse engineering a chip, and how to distinguish between chip piracy and legitimate reverse engineering. They emphasized the evidentiary importance of the "paper trail" of legitimate reverse engineering that helps to distinguish it from mere piracy.[42] The Committee intends that the courts, in interpreting section 906(a), should place great weight on objective documentary evidence of this type.

During both the 1979 and 1983 hearings, the concept of "reverse engineering" was the subject of considerable attention.[43] Witnesses

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[40] H.R. 1028, as introduced, had a more elaborate catalogue of exclusive rights enjoyed by the owner of the mask work. The subcommittee believed that one of these rights—the "use" right—was unnecessary and several of the others duplicative of what remains. The "use" right would have given the owners of mask works the power to sue and recover from persons who used a pirated chip, such as using it in a factory as part of a computerized machine, even though the user had not itself copied, manufactured, or sold the pirated chip. While such a "use" right exists under the patent laws (35 U.S.C. § 271(a)), and may well be appropriate as part of some newly created intellectual property rights, the use right does not exist under the copyright laws, and a number of witnesses questioned the inclusion of such a right in a law protecting mask works. Accordingly, the subcommittee decided to omit such a right as part of this new form of intellectual property, unless and until a showing of real need for such protection is made.

Other exclusive rights provided in the original version of H.R. 1028 have been consolidated now into the reproduction right of section 905(1). This provision is based on the reproduction right provision of original H.R. 1028, but the limitation to reproduction on semiconductor material in the course of manufacture of a semiconductor chip has been eliminated, thereby broadening the reproduction provision to pick up substantially the same rights that section 4 of original H.R. 1028 provided piecemeal. Thus, embodying the mask work in a mask, using a mask embodying a mask work to manufacture a semiconductor chip product, and reproducing images of a mask work on material (clauses (6)(A), (C), and (D), respectively, of section 4 of original H.R. 1028) all are comprehended within the reproduction right of section 905(1).

[41] See National Geographic, supra note 4, at 448-49 for an illustration of this process.

[42] See House Hearings (1983), supra note 7 (Statement of F. Thomas Dunlap, Jr.: "When there is a legitimate job of reverse engineering, there is a very big paper trail, there's a computer simulations, there's all kind of time records, people who have spent an enormous time understanding and figuring out how to make that design") (See also statement of Dorothy Schrader).

[43] See House Hearings (1979), supra note 32, at 21, 57, 69, 70-71, 72-73; House Hearings (1983). supra note 7 (statements of Dorothy Schrader, Jon A. Baumgarten, and F. Thomas Dunlap); Senate Hearings (1983), supra note 31, at 14-15, 65-66, 75, 83-86, 103-105. See also S. Rept. No. 98-425 at 21-22 and statements of Rep. Edwards in Cong. Rec. E5566, 95th Cong., 2d sess. (Daily ed. Oct. 14, 1978); Cong. Rec. H645, 98th Cong., 1st sess. (Daily ed. Feb. 24, 1983); and statement of Senator Mathias, Cong. Rec. S5992, 98th Cong., 1st sess. (Daily ed. May 4, 1983).

generally agreed that two polar situations are encountered: Photographic reproduction of the layout of the original chip and direct incorporation thereof into a second chip; and making improvements on, or at least alternatives to, an existing chip and incorporating substantial but not identical parts of its design into the second chip.

In providing in section 906(a) of the Act for a reverse engineering limitation on the exclusive rights granted in mask works, it is the intent of the Committee to permit and encourage the second type of conduct, but reproduction of the layout of one chip "solely for the purpose of teaching, analyzing, or evaluating the concepts or techniques embodied in the mask work or the circuitry or organization of components used in the mask work" is permitted, even when this is a preliminary step toward the second type of conduct.

Thus, the Committee believes that the reproduction of portions or all of a mask work in a nonprofit classroom or similar place devoted to instruction, for the purpose of studying the principles of computer chip design, does not interfere with the market for or value of the mask work, provides a benefit to the public in advancing scientific knowledge, and should not form the basis for any liability under the Act.

Based on testimony of industry representative that it is an established industry practice to similarly make photo-reproductions of the mask work in order to analyze the existing chip so as to design a second chip with the same electrical and physical performance characteristics as the existing chip (so-called "form, fit and function" compatibility), and that this practice fosters fair competition and provides a frequently needed "second source" for chip products, it is the intent of the Committee to permit such reproduction by competitors where such reproduction is "solely for the purpose of teaching, analyzing, or evaluating" the concepts, techniques, etc. embodied in the work, rather than mere wholesale appropriation of the work and investment in the creation of the first chip.

It is the intent of the Committee to permit, under the reverse engineering limitation, the "unauthorized" creation of a second mask work whose layout, in substantial part, is similar to the layout of the protected mask work—if the second mask work was the product of substantial study and analysis, and not the mere result of plagarism accomplished without such study or analysis.

The Committee believes that this approach strikes the appropriate balance between the rights of the creator and the needs of the public. Designers of future mask works are left free to copy any "idea, procedure, process, system, method or operation, concept, principle, or discovery" (Section 902(c)), which includes "concepts or techniques embodied in the mask work or the circuitry [44] or organization of components used in the mask work" revealed as a result of the reverse engineering permitted in Section 906(a).

In examining whether a given reproduction qualifies for the reverse engineering privilege of section 906(a) it is the intent of the Committee that the doctrine be developed and adapted on a case by

[44] Provided, of course, that the circuitry is not the subject of patent protection.

case basis, like the copyright doctrine of fair use.[45] As with the fair use doctrine, reverse engineering is an affirmative defense.

First sale.—Section 906(b) carriers over to mask works the "exhaustion of monopoly rights" and "first sale" doctrine of 17 U.S.C. § 109(a) and many years of case law. As in the case of copyrighted products, the owner of a mask work has no right to try to exercise "remote control" over the pricing or other business conduct of its semiconductor chip customers, once the semiconductor chips have passed into their hands. Except where the Congress expressly orders otherwise, the exhaustion of any rights by the first authorized sale is a basic tenet of our intellectual property law. See *Boobs-Merrill Co.* v. *Straus*, 210 U.S. 339 (1908); *Adams* v. *Burke*, 84 U.S. (17 Wall.) 453 (1873); *Independent News Co.* v. *Williams*, 293 F.2d 510 (3d Cir. 1961); *C. M. Paula Co.* v. *Logan*, 355 F. Supp. 189 (N.D. Tex. 1973). Accordingly, the Act specifies that purchasers of semiconductor chips have the right to use and resell them freely (whether as chips or incorporated into other products which contain chips).

Section 907—Innocent infringement

Section 907 provides a further limitation on the exclusive rights of mask work owners. Innocent infringers are given exemptions from and limitations on liability. First, section 907(a)(1) exempts from any liability at all the sale of infringing units of protected semiconductor chip products where the purchaser of infringing chips resells them before ever having notice that the chips are protected by this Act. Second, section 907(a)(2) provides that when a person purchases infringing chips innocently, but is given notice of infringement before reselling the chips (e.g., as part of a machine that the purchaser manufactures and sells), the innocent purchaser may resell those chips subject to payment of a reasonable royalty to the mask work owner. The reasonable royalty is to be determined by voluntary negotiation between the parties, mediation, or binding arbitration as determined contractually by the parties, or else, if the parties do not resolve the issue, by a court in an infringement action that the owner of the rights in the mask work brings against the purchaser. It is the view of the Committee that alternatives to litigation will work well here, ultimately achieving equitable results, and reducing litigation costs; consequently, this section will not have a significant impact on the Federal courts. However, this provision is not intended to inject an exhaustion requirement into the Act.[46]

Subsection (b) provides that the same immunity or limitation of liability, as the case may be, extends to customers of the innocent purchaser. Subsection (c) emphasizes that the immunity and limitation of liability apply only as to those specific chips that were innocently purchased. There is no "grandfathering" for later purchases

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[45] 17 U.S.C § 107 (1978). The provisions of Section 107 do not apply to this Chapter, see Section 912(b), and thus there is no right of fair use under the Act.

[46] For further information about alternatives to litigation, see Public Law 96-190, 94 Stat. 17 (1980) (the "Dispute Resolution Act"). See also Hearing on the Dispute Resolution Act Before the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice, 95th Cong., 2d Sess. (1978); Hearing on Resolution of Minor Disputes Before the Hosue Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice and the House Commerce Subcommittee on Consumer Protection and Finance, 96th Cong. 1st Sess. (1979).

of the same type of chip, made by the same person after notice of infringement has occurred and that person's "innocence" is dispelled as to the rights of the mask work registrant.

Whether innocent or not, the mere purchase of an infringing produce does not give rise to liability. The owner of a mask work has the exclusive right under section 905(2) to distribute (including to sell) the chip, but the owner has no exclusive purchasing right. For further information about this concept in copyright law, see *Foreign & Domestic Music Corp.* v. *Licht,* 196 F.2d 627 (2d Cir. 1952) (L. Hand, J.) (purchase copyright infringement).

Section 908—Registration

Unlike the Copyright Act, which makes copyright registration voluntary, this Act requires registration within a reasonable time upon pain of forfeiture of rights under the Act. Mask work owners have two years within which to register; after that, the mask work falls into the public domain if it has not been registered. The Committee believes that this requirement is necessary and desirable to create greater certainty of rights, both for the public and the owners of the mask works.

Forfeiture of rights.—Section 908(a) of the Act provides that protection in a mask work terminates if an application for registration is not filed within two years after the date of first commercial exploitation. As previously discussed, commercial exploitation includes sale of the semiconductor chip product or other distribution thereof to the public, and also offers to sell the semiconductor chip product, once the mask work has already been fixed in a semiconductor chip product (but does not include sales solicitations made before actual production of a commercial semiconductor chip).

Administration.—Section 908(b) confers administrative responsibility for registration of mask works on the Copyright Office. The Register of Copyrights is made responsible for all administrative functions and duties for this chapter. By specific cross reference to chapter 7,[47] the provisions relating to general responsibilities, organizations, regulatory authority, actions, records, and publications of the Copyright Office shall apply. The Register is authorized, however, to make such modifications to those sections as are necessary to satisfy the requirements of this Act. Section 908(c) authorizes and directs the Copyright Office to establish registration procedures. Section 908(d) directs the Copyright Office to establish fees for registration and related services. The level of such fees is to be set by the Copyright Office, taking into consideration the reasonable costs associated with providing the services. The Register must also consider the statutory fee schedules under the Copyright Act, and also, as a countervailing factor, the benefit to the public of having a public record as to mask works. By requiring consideration of cost and the public interest, the Register will have to balance concerning demands. It is the view of the Committee that such balancing will result in fee levels being set at lower than a user fee level.

Examination.—Section 908(e) establishes an examination procedure for chips essentially the same as that under the Copyright

[47] This specific cross reference is the only such reference found in the bill to a provision in the Copyright Act. Section 908(c), infra, contains a general cross reference.

Act. That is, applications are examined only on the basis of the facts set forth in the application, the deposit copy and other identifying material, and the applicable statute, case law and regulations. If the application, identifying materials, and any other information supplied by the applicant or otherwise known to the examiner support the conclusion that the claim is facially in compliance with the statute and regulations, a certificate of registration issues. Thus, there is no examination of the prior art like that under the patent laws.

Certificate of registration.—Section 908(f) provides that a certificate of registration is prima facie evidence of the facts stated in the certificate (such as, presumably, the name of the owner, the fact of ownership, the date of first commercial exploitation, whether the work was for hire, and other information similar to that typically required in a copyright application under 17 U.S.C. § 409). The certificate is also prima facie evidence that the applicant satisfied the requirements of this Act and the Copyright Office's regulations thereunder.

Refusal and failure to register.—Section 908(g) permits an applicant to sue the Register of Copyrights if he or she refuses to issue a certificate of registration of rights under this Act. The suit would be in a Fedeal district court, and in accordance with the Administrative Procedure Act, 5 U.S.C., chapter 7. Venue of such actions is to be governed by the usual provisions, 28 U.S.C. § 1391(e) (the district of the plaintiff's residence or the District of Columbia). If the Register fails to act on an application within three months after it has been received in the Copyright Office, the applicant may treat the failure as a refusal to register and sue to compel registration. A reasonable request by the Register for further information or identifying materials shall not be considered as a failure to act.

Section 909—Notice

Section 909(a) makes notice of mask work protection optional. However, use of notice constitutes prima facie evidence of notice to others that the mask work is protected. Section 909(b) provides an optional form of notice for mask works analogous to that which exists for copyrights and trademarks. The letter M in a circle is used for mask works, as C in a circle, P in a circle, and R in a circle are respectively used for copyrights, sound recordings, and registered trademarks.

Section 910—Enforcement of exclusive rights

Sections 910-911 provide enforcement procedures and remedies for mask works. These sections are generally similar to those which 17 U.S.C. §§ 501-503 and 507(b) provide for copyrighted works. Criminal penalties were not deemed appropriate or necessary, but the maximum level of statutory damages was raised to $250,000, as compared to $10,000 generally and $50,000 maximum for willful conduct (see 17 U.S.C. §§ 504, 506). Also, the prejudgment relief provisions of 17 U.S.C. § 503 are not carried forward.

Section 910(a) defines infringement of a registrant's rights in a mask work in essentially the same terms as 17 U.S.C. § 501(a) defines copyright infringement. It is intended that the concept of infringement of rights in a mask work be essentially the same as

that of infringement of a copyrighted work. Legal concepts used to establish infringement in copyright law—substantial similarity, idea versus expression,[48] and merger of idea and expression when function dictates form [49]—are all carried forward, insofar as applicable, to the new law for mask works protected under this Act.

It is the view of the Committee that existing copyright law can be relied upon to yield a number of principles helpful in interpreting the protection created by this Act. An underlying principle of new chapter 9 is that the reproduction right of § 905(1) is infringed under § 910(a) only when the work alleged to be infringing reproduction rights is "substantially similar" to the protected, registered work. If the mask work embodied in an alleged infringing chip is substantially similar to a registered mask work, then there can be a judicial finding of infringement of the rights conferred by this Act (unless of course an applicable defense of reverse engineering or innocent infringement for others is proved. If the mask work embodied in the alleged infringing chip is not substantially similar to the registered work, there could be no infringement. The second manufacturer is simply engaged in privileged, and socially valuable, free competition from which the public benefits.

While the Committee believes that the courts may usefully consider the copyright law precedents concerning substantial similarity, the Committee also intends that the courts should have sufficient flexibility to develop a new body of law specifically applicable to semiconductor chip infringement. Moreover, the concept of "substantial similarity" varies depending upon the nature of the work.[50] Cases concerning fictional or imaginative works are not necessarily relevant to semiconductor chip infringement; chips are not the same as books, especially fictional literary works. The Committee believes that the line of cases regarding infringement of fact-based works, compilations, and directories provides precedents more applicable to semiconductor chips. See e.g., *Triangle Publications, Inc.* v. *New England Newspaper Pub. Co., et al.,* 46 F. Supp. 198 (D. Mass. 1942); *Triangle Publications, Inc.,* v. *Sports Eye, Inc.,* 415 F. Supp. 682 (E.D. Pa. 1976); *New York Times Co.* v. *Roxbury Data Interface, Inc.,* 434 F. Supp. 217 (D. N.J. 1977); and *Miller* v. *Universal City Studios, Inc.,* 650 F.2d 1365 (5th Cir. 1981).

Mask works sometimes contain substantial areas of (so-called "cells") whose layouts involve creativity and are commercially valuable.[51] In appropriate fact settings, the misappropriation of such a

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[48] See *Baker* v. *Selden,* 101 U.S. 99 (1879). Section 102(b) of the Copyright Act clearly provides that, "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle or discovery, regardless of the form in which it is described, explained, or embodied in such work."

[49] See *Morrissey* v. *Procter & Gamble Co.,* 379 F.2d 675, 678 (1st Cir. 1967): "Moreover, where there are only a limited number of ways to express an idea, there may be no protection for the particular expression.

[50] Compare *Sheldon* v. *Metro-Goldwyn Pictures Corp.,* 81 F.2d 54 (2d Cir. 1936), cert. denied, 298 U.S. 669 (1836) (stage play infringed by motion picture, both loosely based on historical murder) with *Hoelhling* v. *Universal City Studios, Inc.,* 618 F.2d 972 (2d Cir. 1980) (factual book not infringed by motion picture, even though precise events and theories not available elsewhere were copied).

[51] For example, the layout for a counter or an oscillator may be contained in a mask work along with many other "cells" or other parts that together comprise the entire semiconductor chip product. Such a cell may be usable in other chips, and may be the subject of a "cell library license."

cell—assuming it meets the originality standards of this chapter—could be the basis for an infringement action under this chapter. No black letter rule of law can be formulated to draw a precise boundary between substantial similarity and insubstantial similarity under this chapter. This is a classic type of legal question to be put to the judge or jury.

Section 910(b) permits the owner of the rights in a registered mask work to institute a civil action for infringement, similar to a copyright infringement action. The jurisdicitional and other provisions of the Judicial Code (e.g., 28 U.S.C. § 1338) that apply to copyrights are intended to apply also to mask work rights.[52]

Section 910(c) permits the applicant for registration of a mask work to sue for infringement even if the Copyright Office refuses registration. This provision is similar to 17 U.S.C. § 411(a). If the Copyright Office does not refuse to issue a certificate of registration, and simply fails to act, the applicant may treat the failure to register as a refusal, pursuant to section 908(g) of this Act, and then can sue anyway. The Copyright Office may then intervene in the action.

Section 910(d) directs the Treasury and Postal Service to issue regulations to exclude infringing products from entry into the United States. These provisions are generally similar to those of 17 U.S.C. § 603. Accordingly, the owner of rights in a mask work will be able to obtain the assistance of the Customs Service in preventing pirated chips from being imported into the United States. This remedy is in addition to, not in lieu of, the owner's other rights and remedies, such as the right to attempt to secure an injunction against importation from a district court or an exlusion order from the International Trade Commission under 19 U.S.C. § 1337. However, the Customs Service may insist upon such an order as a condition precedent to Customs' action, when the nature of the case so requires to prevent error or injustice.

Section 911—Remedies for infringement

Section 911(a) provides for temporary restraining orders and preliminary injunctions, similar to 17 U.S.C. § 502(a).

Section 911(b) provides for damages and profits, in similar language to that of 17 U.S.C. § 504(b).

Section 911(c) provides statutory damages, in terms generally analogous to 17 U.S.C. § 504(c), but the discretionary amount that can be awarded to the plaintiff is raised to $250,000. This higher limit to what the fact finder (judge or jury as the case may be) may award is based on the very substantial front-end costs of chip creation and the severe adverse economic impacts of misappropriation or incentives to creation of new technology. If also counter-balances the absence of criminal sanctions. Unlawful chip copying, an activity designed primarily for commercial gain, is best controlled through substantially economic sanctions. In using the term "court" in Sections 911 (b) and (c) it is the intent of the Committee, as under 17 U.S.C. § 504(c), that there be a right to a jury where requested.

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[52] See section 912(d), infra.

Section 911(d) provides for counsel fees, similar to 17 U.S.C. § 505.

Section 911(e) creates a three-year statute of limitations and is parallel to present 17 U.S.C. § 507(b).

Section 911(f) provides for seizure and impoundment of infringing chips, masks data base tapes, and other products used to make infringing products; the section is parallel to present 17 U.S.C. § 509.

Section 912—Relation to other laws

Section 912 relates the provisions of this Act to the existing copyright and patent laws.

Section 912(a) provides that nothing in this Act concerning mask works shall add to or detract from existing rights as to copyrighted or patented works. Specifically, it is not intended that Chapter 9 limit, enlarge or otherwise affect the scope, duration, ownership or subsistence of copyright protection under Chapters 1 through 8 in computer programs, data bases, or any other copyrightable works embodied in semiconductor chip products. For example, if a semiconductor chip product contains patented circuitry, the patent is not affected by this Act's mask work protection of the chip layout. The patent rights commence when protected under the state law, or so that chips protected under this law were subjected to free use under state law. See generally, *Sears, Roebuck & Co.* v. *Stiffel Co.*, 376 U.S. 225 (1964); *Compco Corp.* v. *Day-Brite Lighting, Inc.*, 376 U.S. 234 (1964).

The Committee intends, however, that state laws protecting trade secrets shall not be preempted. Trade secret laws provide a different form of protection than that found in Chapter 9.

As under section 301 of the Copyright Act, state trade secret law provides "non-equivalent" rights and remedies and thus constitutes a notable example of an exception to federal preemption.[53] The availability of trade secret protection, subject to the traditional criteria for trade secrets, is important for mask works; but such availability is doubly important prior to regisration or commercial exploitation of the mask work, because under section 904(a) a mask work has no protection under chapter 9 until it has been registered or commercially exploited. As a consequence, state trade secret law is a necessary adjunct to this Act, and provides needed protection during a time period when this law provides none.[54]

Of course, a state could not, in the name of state trade secret law, provide protection for non-secrets. As the Supreme Court stated in *Kewanee Oil Co.* v. *Bicron Corp.*, 417 U.S. 470, 475 (1974), "the subject of a trade secret must be secret, and must not be of public knowledge or of a general knowledge in the trade or business." Also, a state could not protect against competition the "secrecy" of a mask work that is concealed only by being placed inside the plastic or ceramic package of a publicly marketed semiconductor chip—whether or not the creativity of the chip's layout satisfied

[53] Other examples of "non-equivalent," and hence non-preempted, State rights would include breaches of contract, breaches of trust, trespass, conversion and deceptive trade practices such as passing off and false representation.

[54] In contrast, H.R. 1028 as introduced and the copryright laws would commence protection of a work upon its initial fixation. See 17 U.S.C. §§ 102(a), 302(a); See also 17 U.S.C. § 101 (definition of "created").

§ 902(b)(2). If state law did so, it would "give protection of a kind that clashes with the objectives of the federal [mask work] laws." *Sears, Roebuck & Co.* v. *Stiffel Co.*, 376 U.S. 225, 231 (1964). "To forbid [such] copying would interfere with the federal policy, found in [this Act], of allowing fee access to copy whatever the federal [mask work] laws leave in the public domain." *Compco Corp.* v. *Day-Brite Lighting, Inc.*, 376 U.S. 234, 237 (1964).

Section 912(d) is a technical amendment, making certain provisions of the Judicial Code that apply to copyrights also apply to mask works protected by this Act.

Section 3—Table of Chapters

Section 3 of this Act provides a necessary conforming change, amending the table of chapters in title 17 to include chapter 9.

Section 4—Effective Date

Section 4 concerns the effective date of the Act. Generally, the Act takes effect on January 1, 1985. However, a phase-in period is provided. Section 4(b)(1) gives limited protection to mask works put onto the market on or after January 1, 1984. However, mask works must be registered promptly to qualify for such limited protection; the application must be filed during 1985 or the right to come within this section is forfeited.

Section 4(b)(2) describes the limited protection for chips introduced in 1984. If a domestic or foreign manufacturer manufactures semiconductor chips before January 1, 1985 (i.e., during 1984), even though that manufacturer copied the products in 1984 from the owner of the mask work, the copying manufacturer (and its distributors) can sell in the United States (and can import into the United States) all of the units that the manufacturer manufactured in 1984, subject only to the payment to the mask work owner of the reasonable royalty specified in section 907(a)(2), supra.[55]

The Committee was well aware of the dangers—constitutional and otherwise—lurking in retroactive legislation. See 1 *Nimmer on Copyright*, § 1.11 (1982). Indisputably, an interest in a copyright is a property right protected by the due process and just compensation clauses of the Constitution. See *Roth* v. *Pritikin*, 710 F.2d 934, 939 (2d Cir. 1983); *Lorett* v. *Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982). The Committee presumes that retroactive mask work protection would be subjected to the same constitutional analysis as retroactive copyright legislation. As a consequence, the Committee prefers not to confront the spectre of a constitutional issue concerning the proper application of the takings and due process clauses. Section 4(b)(2) therefore contains a very short retroactive time period coupled with a compulsory license (see section

[55] For example: United States company A puts a new chip onto the market on March 1, 1984; foreign company B copies the mask work embodied in the chip and manufactures 100,000 such chips during 1984; B manufactures another 250,000 such chips in 1985. Subject only to payment of a reasonable royalty to A, B can export all of the first 100,000 chips to the United States, and B or its distributors can sell those chips in the United States, in 1985, 1986, or any subsequent year, without further liability to A under this Act. However, none of the second 250,000 chips may be imported into the United States or be distributed in the United States during the ten-year life of A's rights under this Act. The same principles would apply to company C, a United States copyist. Thus, this section affords the same rights and liabilities to domestic and foreign manufacturers.

907, infra).[56] A short retroactive time-period—back to January 1, 1984—can be justified due to the fact that copyists had been on notice since that time that legislation was likely to pass before the end of the 98th Congress.[57] A similar "notice" argument cannot be made for past Congresses, because each new Congress starts afresh. Thus, legislation introduced during the 96th Congress—which did not even make it to subcommittee mark-up and was substantially different that any bill pending in the 98th Congress—cannot be considered as due notice that favorable action would occur during the 98th Congress. The limits of the Constitution, absent a showing of overriding national need and significant public purpose which has not been made to this Committee, cannot be so stretched without risking a judicial finding of unconstitutional infirmity.

In comparison, a reasonable argument can be made for a short retroactive time-period coupled with an innocent infringement section (e.g., compulsory licensing). Due notice has occurred and the "taking" amounts only to payment of a reasonable sum of money for using a "copied" chip product in the future.

Moreover, making the Act effective on the date of enactment would have encouraged creators to keep "state of the art" chips off the market in anticipation of prospective protection, thereby dramatically reducing the creativity that is one of the principal goals of this legislation. The Committee therefore opted for a relatively short phase-in period. The net-result will benefit the public.

OVERSIGHT FINDINGS

Oversight of this Nation's intellectual property laws—patents, trademarks and copyright—is the responsibility of the Committee on the Judiciary. During the 96th and 98th Congresses, the committee, acting through the Subcommittee on Courts, Civil Liberties, and the Administration of Justice, held numerous days of hearings on the specific issue of copyright protection for semiconductor chip products and the general subject of copyright and technological change.

Pursuant to clause 2(a)(3)(A) of rule XI of the Rules of the House of Representatives, the committee issues the following findings:

to promote the progress of science and useful arts, the Constitution of the United States, in Article I, Section 8, Clause 8, authorizes the Congress to grant authors for a limited time "the exclusive right to their respective writing";

the intellectual property system of the United States must meet the constitutional mandate by providing an economic incentive to authors of new categories of creative works, while encouraging the public availability of such works;

there is a demonstrated need to protect original mask works fixed in semiconductor chip products;

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[56] In contrast, H.R. 1028 as introduced was fairly clearly retroactive in application. Similarly, S. 1201 (as reported by the Senate Judiciary Committee) is retroactive to 1980.

[57] On Jan. 1, 1984, hearings had been terminated in both the House and Senate. Prior to that date (on Nov. 17, 1983), the Senate Subcommittee on Patents, Copyrights and Trademarks approved a substitute amendment to S. 1201. In the House, an announcement had been made that a subcommittee mark-up was imminent.

the existing provisions of title 17, United States Code, do not protect mask works fixed in semiconductor chip products, in and of themselves; and

it is preferable to protect original mask works fixed in semiconductor chip products outside the scope of traditional copyright by adding a new chapter to title 17 of the United States Code, separate from an independent of Chapters 1 through 8, in order to afford protection for original mask works either as a "writing" under the Constitution or under the authority of the Commerce Power of the Constitution.

NEW BUDGET AUTHORITY

In regard to clause 2(l)(3)(B) of rule XI of the Rules of the House of Representatives, the bill creates no new budget authority on increased tax expenditures for the Federal government.

INFLATIONARY IMPACT STATEMENT

Pursuant to clause 2(l)(4) of rule XI of the Rules of the House of Representatives, the committee feels that the bill will have no foreseeable inflationary impact on prices or costs in the operation of the national economy.

FEDERAL ADVISORY COMMITTEE ACT OF 1972

The Committee finds that this legislation does not create any new advisory committees within the meaining of the Federal Advisory Committee Act of 1972.

COST ESTIMATE

In regard to clause 7 of rule XIII of the Rules of the House of Representatives, the committee agrees with the cost estimate of the Congressional Budget Office.

STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 2(l)(3) of rule XI of the Rules of the House of Representatives, and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate on H.R. 5525 prepared by the Congressional Budget Office.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 14, 1984.

Hon. PETER W. RODINO, Jr.,
Chairman, Committee on the Judiciary, U.S. House of Representatives, Rayburn House Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed H.R. 5525, the Semiconductor Chip Protection Act of 1984, as ordered reported by the House Committee on the Judiciary, May 1, 1984. We estimate that enactmentof this bill would cost the federal government about $200,000 per year for the next three years, and less thereafter.

H.R. 5525, which become effective January 1, 1985, would grant ten-year proprietary protection to mask works for semiconductor

chip products. It would establish a registration process administered by the Copyright Office and would take a number of other steps for the protection of mask works.

Based on information provided by the Copyright Office, we expect some costs to be incurred for conversion of existing computer software and for processing of copyright applications, offset partially by registration fees. The net costs are expected to be about $200,000 per year in fiscal years 1985 through 1987, and less than $100,000 annually thereafter.

No costs will be incurred by state or local governments as a result of the enactment of this bill.

This letter supersedes a previous estimate dated May 9, 1984, and clarifies the description of the bill's purpose. The estimated cost of the bill remains the same.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

ERIC HANUSHEK
(For Rudolph G. Penner, Director).

COMMITTEE VOTE

H.R. 5525 was reported favorable by voice vote, no objection being heard, and a quorum of Members being present.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

TITLE 17, UNITED STATES CODE

TITLE 17—COPYRIGHTS

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CHAPTER 9—PROTECTION OF SEMICONDUCTOR CHIP PRODUCTS

§ 901. Definitions

As used in this chapter—

(1) a "semiconductor chip product" is the final or intermediate form of any product—

(A) having two or more layers of metallic, insulating, or simiconductor material deposited or otherwise placed on, or etched away or otherwise removed from, a piece of semiconductor material in accordance with a predetermined pattern; and

(B) that is intended to perform electronic circuitry functions;

(2) a "mask work" means the 2-dimensional and 3-dimensional features of shapes, pattern, and configuration of the surface of the layers of a semiconductor chip product, regardless of whether such features have an intrinsic utilitarian function that is not only to portray the appearance of the product or to convey information;

(3) a mask work is "fixed" in a semiconductor chip product when its embodiment in the product, by or under the authority of the owner of the mask work, is sufficiently permanent or stable to permit the mask work to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration;

(4) a mask work is "original" if it is the independent creation of an author who did not copy it from another source;

(5) to "commercially exploit" a mask work is to sell, offer for sale after the mask work is fixed in a semiconductor chip product, or otherwise distribute to the public for profit semiconductor chip products embodying the mask work;

(6) the "owner" of a mask work is the author of the mask work, the legal representatives of a deceased author or of an author under a legal incapacity, the employer of an author who created the mask work for the employer in the case of a work made within the scope of the author's employment, or a person to whom the rights of the author or of such employer are transferred in accordance with this chapter;

(7) an "innocent purchaser" is a person who purchases a semiconductor chip product in good faith and without having notice of protection with respect to that semiconductor chip product;

(8) having "notice of protection" means having actual knowledge that, or reasonable grounds to believe that, a mask work fixed in a semiconductor chip product is protected under this chapter; and

(9) an "infringing semiconductor chip product" is a semiconductor chip product which is made, imported, or distributed in

violation of the exclusive rights of the owner of a mask work under this chapter.

§ 902. Subject matter of protection

(a)(1) An original mask work fixed in a semiconductor chip product is eligible for protection under this chapter if—

(A) on the date on which the mask work is registered under section 908, or the date on which the mask work is first commercially exploited, whichever occurs first, the owner of the mask work is a national or domiciliary of the United States, or is a national, domiciliary, or sovereign authority of a foreign nation that is a party to a treaty affording protection to mask works to which the United States is also a party, or is a stateless person, wherever that person may be domiciled;

(B) the mask work is first commercially exploited in the United States; or

(C) the mask work comes within the scope of a Presidential proclamation within the scope of a Presidential proclamation issued under paragraph (2).

(2) Whenever the President finds that a foreign nation extends, to mask works of owners who are nationals or domiciliaries of the United States or to mask works on the date on which the mask works are registered under section 908, or the date on which the mask works are first commercially exploited, whichever occurs first, protection (A) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (B) on substantially the same basis as provided in this chapter, the President may by proclamation extend protection under this chapter to mask works (i) of owners who are, on the date on which the mask works are registered under section 908, or the date on which the mask works are first commercially exploited, whichever occurs first, nationals, domiciliaries, or sovereign authorities of that nation, or (ii) which are first commercially exploited in that nation.

(b) Protection under this chapter shall not be available for a mask work that—

(1) is not original; or

(2) consists of designs that are staple, commonplace, or familiar in the semiconductor industry, or variations of such designs, combined in a way that is not original.

(c) In no case does protection under this chapter for a mask work extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in the mask work.

§ 903. Ownership and transfer

(a) The exclusive rights in a mask work subject to protection under this chapter shall vest in the owner of the mask work.

(b) The exclusive rights in a mask work registered under section 908, or a mask work for which an application for registration has been or is eligible to be filed under section 908, may be transferred in whole or in part by any means of conveyance or by operation of

law, and may be bequeathed by will or pass as personal property by the applicable laws of intestate succession.

(c) In any case in which conflicting transfers of the exclusive rights in a mask work are made, the transfer first executed shall be void as against a subsequent transfer which is made for a valuable consideration and without notice of the first transfer, unless the first transfer is recorded in the Copyright Office within three months after the date on which it is executed, but in no case later than the day before the date of such subsequent transfer.

(d) Mask works prepared by an officer or employee of the United States Government as part of that person's official duties are not protected under this chapter, but the United States Government is not precluded from receiving and holding exclusive rights in mask works transferred to the Government under subsection (b).

§ 904. Duration of protection

(a) The protection provided for a mask work under this chapter shall commence on the date on which the mask work is registered under section 908, or the date on which the mask work is first commercially exploited, whichever occurs first.

(b) Subject to the provisions of this chapter, the protection provided under this chapter to a mask work shall continue for a term of ten years beginning on the date on which such protection commences under subsection (a).

§ 905. Exclusive rights in mask works

Subject to the other provisions of this chapter, the owner of a mask work has the exclusive rights to do and to authorize any of the following:

(1) to reproduce the mask work by optical, electronic, or any other means;

(2) to import or distribute a semiconductor chip product in which the mask work is embodied; and

(3) to induce or knowingly to cause another person to do any of the acts described in paragraphs (1) and (2).

§ 906. Limitation on exclusive rights: reverse engineering; first sale

(a) Notwithstanding the provisions of section 905(1), it is not an infringement of the exclusive rights of the owner of a mask work to reproduce the work solely for the purpose of teaching, analyzing, or evaluating the concepts or techniques embodied in the mask work or the circuitry or organization of components used in the mask work.

(b) Notwithstanding the provisions of section 905(2), the owner of a particular semiconductor chip product lawfully made under this chapter, or any person authorized by such owner, is entitled, without the authority of the owner of the mask work, to sell or otherwise dispose of that semiconductor chip product.

§ 907. Limitation on exclusive rights: innocent infringement

(a) Notwithstanding any other provision of this chapter, an innocent purchaser of an infringing semiconductor chip product—

(1) shall incur no liability under this chapter with respect to the distribution of units of the infringing semiconductor chip product that occurred before that innocent purchaser had notice

of protection with respect to that semiconductor chip product; and

(2) shall be liable only for a reasonable royalty on each unit of the infringing semiconductor chip product that the innocent purchaser distributed after having notice of protection with respect to that semiconductor chip product.

The amount of the royalty referred to in paragraph (2) shall be determined by voluntary negotiation between the parties, mediation, or binding arbitration, or, if the parties do not resolve the issue, by the court in a civil action for infringement.

(b) The immunity from liability and limitation on liability referred to in subsection (a) shall apply to any person who directly or indirectly purchases an infringing semiconductor chip product from an innocent purchaser.

(c) The provisions of subsections (a) and (b) apply only with respect to units of an infringing semiconductor chip product that an innocent purchaser purchased before having notice of protection with respect to that semiconductor chip product.

§ 908. Registration of claims of protection

(a) Protection of a mask work under this chapter shall terminate if application for registration of a claim of protection in the mask work is not made as provided by this chapter within two years after the date on which the mask work is first commercially exploited.

(b) The Register of Copyrights shall be responsible for all administrative functions and duties under this chapter. Except for section 708, the provisions of chapter 7 of this title relating to the general responsibilities, organization, regulatory authority, actions, records, and publications of the Copyright Office shall apply to this chapter, except that the Register of Copyrights may make such changes as may be necessary in applying those provisions to this chapter.

(c) The application for registration of a mask work shall be made on a form prescribed by the Register of Copyrights and shall include any information regarded by the Register of Copyrights as bearing upon the preparation or identification of the work, the existence or duration of protection, or ownership of the work.

(d) The Register of Copyrights shall by regulation set reasonable fees for the filing of applications to register claims of protection in mask works under this chapter, and for other services relating to the administration of this chapter or the rights under this chapter, taking into consideration the cost of providing those services, the benefits of a public record, and statutory fee schedules under this title. The Register shall also specify the identifying material to be deposited in connection with the claim for registration.

(e) If the Register of Copyrights, after examining an application for registration, determines, in accordance with the provisions of this chapter, that the application relates to a mask work which warrants protection under this chapter, then the Register shall register the claim and issue to the applicant a certificate of registration of the claim under the seal of the Copyright Office. The effective date of registration of a claim of protection shall be the date on which an application, deposit, and fee, which are determined by the Register of Copyrights or by a court of competent jurisdiction to be

acceptable for registration, have all been received in the Copyright Office.

(f) In any action for infringement under this chapter, the certificate of registration of a mask work shall constitute prima facie evidence (1) of the facts stated in the certificate, and (2) that the applicant issued the certificate has met the requirements of this chapter, and the regulations issued under this chapter, with respect to the registration of claims.

(g) Any applicant for registration under this section who is dissatisfied with the refusal of the Register of Copyrights to issue a certificate of registration under this section may seek judicial review of that refusal by bringing an action for such review in an appropriate United States district court, in accordance with chapter 7 of title 5, not later than sixty days after the refusal. The failure of the Register of Copyrights to issue a certificate of registration within three months after an application for registration is filed shall be deemed to be a refusal to issue a certificate of registration for purposes of this subsection and section 910(c).

§ 909. Mask work notice

(a) The owner of a mask work provided protection under this chapter may affix notice to the mask work or to the semiconductor chip product embodying the mask work in such manner and location as to give reasonable notice of such protection. The Register of Copyrights shall prescribe by regulation, as examples, specific methods of affixation and positions of notice for purposes of this section, but these specifications shall not be considered exhaustive. The affixation of such notice is not a condition of protection under this chapter, but shall constitute prima facie evidence of notice of protection.

(b) The notice referred to in subsection (a) shall consist of—

(1) the words "mask work," or the letter M in a circle Ⓜ;

(2) the year in which the mask work was first fixed in a semiconductor chip product; and

(3) the name of the owner or owners of the mask work or an abbreviation by which the name is recognized or is generally known.

§ 910. Enforcement of exclusive rights

(a) Except as otherwise provided by this chapter, any person who violates any of the exclusive rights of the owner of a mask work under this chapter shall be liable as an infringer of such rights.

(b) The owner of a mask work protected under this chapter shall be entitled to institute a civil action for infringement after a certificate of registration of a claim in that mask work is issued under section 908.

(c) In any case in which an application for registration and the required deposit and fee have been received in the Copyright Office in proper form and registration of the mask work has been refused, the applicant is entitled to institute a civil action for infringement under this chapter if notice of the action, together with a copy of the complaint, is served on the Register of Copyrights, in accordance with the Federal Rules of Civil Procedure. The Register may, at his or her option, become a party to the action with respect to the issue

of whether the claim is eligible for registration by entering an appearance within sixty days after such service, but the failure of the Register to become a party to the action shall not deprive the court of jurisdiction to determine that issue.

(d)(1) The Secretary of the Treasury and the United States Postal Service shall separately or jointly issue regulations for the enforcement of the right to import set forth in section 905. These regulations may require, as a condition for the exclusion of articles from the United States, that the person seeking exclusion—

(A) obtain a court order enjoining, or an order of the International Trade Commission under section 337 of the Tariff Act of 1930 excluding, importation of the articles; or

(B) furnish proof that the mask work involved is protected under this chapter and that the importation of the articles would infringe the rights in the mask work under this chapter, and also post a surety bond for any injury that may result if the detention or exclusion of the articles proves to be unjustified.

(2) Articles imported in violation of the right to import set forth in section 905 are subject to seizure and forfeiture in the same manner as property imported in violation of the customs laws. Any such forfeited articles shall be destroyed as directed by the Secretary of the Treasury or the court, as the case may be, except that the articles may be returned to the country of export whenever it is shown to the satisfaction of the Secretary of the Treasury that the importer had no reasonable grounds for believing that his or her acts constituted a violation of the law.

§ 911. Remedies for infringement

(a) Any court having jurisdiction of a civil action arising under this chapter may grant temporary and permanent injunctions on such terms as the court may deem reasonable to prevent or restrain infringement of the exclusive rights in a mask work under this chapter.

(b) Upon finding for the owner of the mask work, the court shall award the owner actual damages suffered by the owner as a result of the infringement. The court shall also award the owner the infringer's profits that are attributable to the infringement and are not taken into account in computing the award of actual damages. In establishing the infringer's profits, the owner of the mask work is required to present proof only of the infringer's gross revenue, and the infringer is required to prove his or her deductible expenses and the elements of profit attributable to factors other than the mask work.

(c) At any time before final judgment is rendered, the owner of the mask work may elect, instead of actual damages and profits as provided by subsection (b), an award of statutory damages for all infringements involved in the action, with respect to any one mask work for which any one infringer is liable individually, or for which any two or more infringers are liable jointly and severally, in an amount not more than $250,000 as the court considers just.

(d) In any action for infringement under this chapter, the court in its discretion may allow the recovery of full costs, including reasonable attorneys' fees, to the prevailing party.

(e) An action for infringement under this chapter shall not be maintained unless the action is commenced within three years after the claim accrues.

(f) As part of a final judgment or decree, the court may order the destruction or other disposition of any infringing semiconductor chip products, and any masks, tapes, or other articles by means of which such products may be reproduced.

§ 912. Relation to other laws

(a) Nothing in this chapter shall affect any right or remedy held by any person under chapters 1 through 8 of this title, or under title 35.

(b) Except as provided in section 908(b) of this title, references to "this title" or "title 17" in chapters 1 through 8 of this title shall be deemed not to apply to this chapter.

(c) The provisions of this chapter shall preempt the laws of any State to the extent those laws provide any rights or remedies with respect to a mask work which are equivalent to those provided by this chapter, except that such preemption shall be effective only with respect to actions filed on or after January 1, 1986.

(d) The provisions of sections 1338, 1400(a), and 1498 (b) and (c) of *title 28 shall apply with respect to exclusive rights in mask works under this chapter.*

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APPENDIX A

A SUMMARY COMPARISON OF H.R. 1028 (COPYRIGHT ACT PROTECTION) AND H.R. 5525 (SUI GENERIS CHAPTER 9 PROTECTION)

H.R. 1028	H.R. 5525
1. Amends Copyright Act, title 17 Chapters 1 through 8.....	Creates new form of legal protection in separate, independent Chapter 9 of title 17 U.S. Code; specific declaration in section 912 of the complete separation between "Chapter 9 rights" and the copyright and patent statutes.
2. Standard of protectability: "original works of authorship;" must meet same standard as other copyrightable subject matter.	Original—consists of more than staple, commonplace or familiar designs in the semiconductor industry, or mere variations or unoriginal combinations thereof.
3. Constitutional basis: specific declaration that chip product may be either a writing or a discovery, or the manufacture, use, or distribution of which is in or affects commerce. No comparable statement re "mask work." (Note that there is a conflict between the reference to "discovery" and the prohibition against protection for a "discovery" in 17 U.S.C. 102(b)).	Declaration in legislative committee report that "mask works" are writings under Article I, Section 8, Clause 8; finding that Commerce Power is an alternative constitutional basis.
4. Definitions: Definitions of "semiconductor chip product," "mask work," and "mask".	Same definition of semiconductor chip product except Clause (3) is dropped; new definition of "mask work; definitions of the Copyright Act do not apply.

A SUMMARY COMPARISON OF H.R. 1028 (COPYRIGHT ACT PROTECTION) AND H.R. 5525 (SUI GENERIS CHAPTER 9 PROTECTION)—Continued

H.R. 1028	H.R. 5525
Unclear which definitions of 17 U.S.C. 101 apply; questions arise, especially, regarding the critical term "copy"—the bill lists only 9 sections of 17 U.S.C. in which "copy" includes a semiconductor chip product; section 101, in which copy is defined, is not one of the nine.	
5. Exclusive rights: New rights to embody the mask work in a mask and to distribute a mask embodying the mask work; to use a mask embodying the mask work to make a chip product; in the manufacture of a chip product, substantially to reproduce images of the mask work on material intended to be a part of the chip product; and to distribute or use a chip product embodying the mask work or in whose manufacture images of the mask work were substantially reproduced on material intended to be part of the chip product.	To reproduce the mask work by optical, electronic, or any other means; to import or distribute chip products embodying the mask work; and to induce or knowingly to cause infringement of "Chapter 9 rights."
6. Reverse engineeing: No reverse engineering provision (Note: Representative Edwards' detailed analysis of H.R. 1028 appearing at 129 Congressional Record H-645 (February 24, 1983) makes clear that the intent of the bill's sponsors was not to interfere with use of a chip for reverse engineering).	Specific provision that reverse engineering is not an infringement.
7. Compulsory license: Created for benefit of purchaser without notice of infringement, who committed substantial funds to use chip, where equity requires further use privilege.	No compulsory license: but see innocent purchaser provision.
8. Duration: 10 years from the first authorized distribution, use in a commercial product, or manufacture in commercial quantities in chips.	10 years from date the mask work is registered or date of first commercial exploitation, whichever occurs first.
9. Method of obtaining protection: Copyright from creation; notice of copyright required on publicly distributed copies in visually perceptible form.	Mandatory registration—inchoate protection for two years from fixation without any formalities; but unless registration is made within that period, all protection is lost.
10. Notice of copyright: Same requirement applies as for all copyrightable subject matter; if notice is omitted from publicly distributed copies or phonorecords, protection is lost unless registration is made before or within 5 years of publication, and other curative steps are taken.	Notice is optional; it is not a condition of protection but has evidentiary value; registration is the only formality that is a condition of protection; this means that the Universal Copyright Convention will clearly not be applicable to mask works (since the UCC notice is the sole formality permitted as a condition of protection).
11. Innocent infringement: good faith purchaser of chip product without notice of infringement is not liable for distribution of chip products before notice of infringement. Query liability for infringing acts other than distribution.	Innocent purchaser is not liable for distribution of protected work before having notice of protection; after notice of protection, liability limited to reasonable royalty.
12. Remedies: Existing remedies of the Copyright Act	Comparable civil remedies except new $250,000 statutory damage maximum; no general criminal infringement penalty.
13. Effective date: Effective 90 days after date of enactment but specifically does not apply to chips or masks manufactured in or imported into the U.S. before the effective date, or chips manufactured in the U.S. by means of masks made in or imported into the U.S. before the effective date.	January 1, 1985.
14. Retroactivity: Uncertainty about retroactive effect	Protection for works commercially exploited before effective date but no earlier than January 1, 1984, provided registration is made by January 1, 1986:; remedy limited to reasonable royalty for infringing chip products manufactured before the effective date.
15. Registration system: No examination of prior art; examination for copyrightable subject matter and compliance with legal and formal requirements.	Similar system. No examination of prior art.
Registration optional but prerequisite to infringement action.	Registration is mandatory within two years of commercial exploitation.
Certificate of registration is prima facie evidence of the validity of the copyright, if registration is timely made.	Certificate of registration is prima facie evidence (1) of the facts, and (2) that the requirements of chapter 9 and any regulation with respect to registration, have been met.

A SUMMARY COMPARISON OF H.R. 1028 (COPYRIGHT ACT PROTECTION) AND H.R. 5525 (SUI GENERIS CHAPTER 9 PROTECTION)—Continued

H.R. 1028	H.R. 5525
16. Fees: 10 dollars	Fixed by the Register of Copyrights based on these factors: cost, benefit of public record, and statutory fee schedule for registration of copyrighted works.