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ACTION

Remarks by Mr. Edwards of California

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H.R. 1028, SEMICONDUCTOR CHIP PROTECTION ACT OF 1983

The SPEAKER pro tempore. Under a previous order of the House, the gentleman from California (Mr. EDWARDS) is recognized for 30 minutes.

● Mr. EDWARDS of California. Mr. Speaker, H.R. 1028 is a bill to amend title 17 of the United States Code to protect semiconductor chips and masks against unauthorized duplication, and for other purposes; to the Committee on the Judiciary.

SEMICONDUCTOR CHIP PROTECTION ACT OF 1983

On January 27, 1983, Congressman MINETA and I introduced a bill to extend the copyright law to protect semiconductor chip designs. Integrated circuits, or semiconductor "chips," have revolutionized the electronics industry. These chips are used to operate microwave ovens, cash registers, typewriters, printers, TV sets, refrigerators, hi-fi equipment, automobile engine controls, and many other consumer and industrial products. The chips are typically a quarter-inch square, and yet they may contain over 100,000 transistors photographically etched and deposited on a silicon wafer. Fitting these transistors into that small space, and placing them so that the device operates efficiently and economically, is a fine art and also a costly one. The layout and design process, and the preparation of the photographic "masks" used to etch, deposit layers on, and otherwise process the chips often take the innovating chip firms years, consume thousands of hours of their engineers' and technicians' time, and cost millions of dollars.

Yet, a pirate firm can photograph the chip and its layers, and in several months and for a cost of less than $50,000 duplicate the mask work of the innovator. Because the pirate firm does not have the enormous development costs borne by the innovator, the pirate firm can undersell the innovator and flood the market with cheap copies of the chip.

Continuation of such piracy may make it impossible for the semiconductor industry to continue to invest in development of new chips. Thus, unless this piracy is stopped, the industrial leadership enjoyed in the past by the American semiconductor industry may vanish.

Present law offers American industry only limited protection against this misappropriation of their technology. The current copyright laws give little, if any, protection, to semiconductor chips. 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 art work performed by the different American chip manufacturers in adapting those electronic circuits for a particular industrial purpose. Yet, it is those layouts and art works that consume thousands of staff hours, cost millions of dollars, and are pirated by free riders.

Summary of the bill. The bill addresses two major issues. First, it protects the substantial investments of innovating firms from misappropriation. It does this by granting 10 years of copyright protection to those who develop new integrated circuit mask designs and grants copyright owners exclusive rights to make, distribute, and reproduce images of the mask design and the chips embodying that design. Second, it protects semiconductor chip users from liability for innocent conduct and it also makes compulsory, reasonable royalty licenses available to them when necessary to protect their reasonable interests in their ongoing business activities as users of chips.

The text and the analysis of the bill follows:

H.R. 1028

A bill to amend title 17 of the United States Code to protect semiconductor chips and masks against unauthorized duplication, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Semiconductor Chip Protection Act of 1983".

DEFINITIONS

SEC. 2. Section 101 of title 17 of the United States Code is amended by adding at the end thereof the following:

"A 'semiconductor chip product' is the final or intermediate form of a product—

"(1) having two or more layers of metallic, insulating, or semiconductor material, deposited on or etched away from a piece of semiconductor material in accordance with a predetermined pattern;

"(2) intended to perform electronic circuitry functions; and

"(3) that is a writing or a discovery, or the manufacture, use, or distribution of which is in or affects commerce.

"A 'mask work' is a series of related images—

"(1) having the predetermined, three-dimensional pattern of metallic, insulating, or semiconductor material present or removed from the layers of a semiconductor chip product; and

"(2) in which series the relation of the images to one another is that each image has the pattern of the surface of one form of the semiconductor chip product.

"A 'mask' is a substantially two-dimensional partially transparent and partially opaque sheet. A mask embodies a mask work if the pattern of transparent and opaque portions of the mask is substantially similar to the pattern of one of the images of the mask work. Masks and mask works shall not be deemed pictorial, graphic, or sculptural works.

"As used in sections 109(a), 401, 405, 406, 501(a), 503, 506, 509, and 602 of this title, 'copy' includes a semi-conductor chip product that is subject to the exclusive rights described in section 106.".

SUBJECT MATTER OF COPYRIGHT

SEC. 3. Section 102(a) of title 17 of the United States Code is amended—

(1) by adding after paragraph (5) the following:

"(6) mask works;"; and

(2) by redesignating paragraphs (6) and (7) as paragraphs (7) and (8), respectively.

EXCLUSIVE RIGHTS

SEC. 4. Section 106 of title 17 of the United States Code is amended—

(1) by striking out "and" at the end of paragraph (4);

(2) by striking out the period at the end of paragraph (5) and inserting "; and" in lieu thereof; and

(3) adding at the end thereof the following:

"(6) in the case of mask works—

"(A) to embody the mask owrk in a mask;

"(B) to distribute a mask embodying the mask work;

"(C) to use a mask embodying the mask work to make a semiconductor chip product;

"(D) in the manufacture of a semiconductor chip product, substanitally to reproduce, by optical, electronic, or other means, images of the mask work on material intended to be part of the semiconductor chip product; and

"(E) to distribute or use a semiconductor chip product made as described in subclause (C) or (D) of clause (6) of this section.".

LIMITATION ON EXCLUSIVE RIGHTS AS TO MASKS

SEC. 5. (a) Chapter 1 of title 17 of the United States Code is amended by adding at the end the following:

"§ 119. Scope of exclusive rights: Compulsory licensing with respect to mask works

"(a) In the case of mask works, the exclusive rights provided by section 106 are subject to compulsory licensing under the conditions specified by this section.

"(b) The owner of a copyright on a mask work shall be required to grant a compulsory license under the copyright, to any applicant therefor, on the following terms and

conditions, and in the following circumstances:

"(1) The applicant has purchased a semiconductor chip product made or distributed in violation of the owner's exclusive rights under section 106.

"(2) When the applicant first purchased such semiconductor chip product (hereinafter in this section referred to as the 'infringing product'), the applicant did not have actual knowledge that or reasonable grounds to believe that the infringing product was an infringing product (hereinafter in this section referred to as 'having notice of infringement').

"(3) The applicant, before having notice of infringement, committed substantial funds to the use of the infringing product; the applicant would suffer substantial out-of-pocket losses (other than the difference in price between the infringing product and a noninfringing product) if denied the use of the infringing product; and it would be inequitable in the circumstances not to permit the applicant to continue the use or proposed use of the infringing product.

"(4) The applicant offers, subject to the applicant's rights, if any, under section 501(e) of this title, to pay the copyright owner a reasonable royalty for infringing products.

"(5) The royalty shall be for each unit of the infringing product distributed or used by the applicant after having notice of infringement.

"(6) The license shall be one to make, have made (but only if the copyright owner and the owner's licensees, if any, are unable to supply the applicant at a reasonable price), use, and distribute the infringing product, for substantially the same purposes that gave rise to the applicant's right to a compulsory license, throughout the United States, for the life of the copyright, revocable only for failure to make timely payments of royalties.".

(b) The sectional analysis at the beginning of chapter 1 of title 17 is amended by adding the following:

"119. Scope of exclusive rights: Compulsory licensing with respect to mask works.".

DURATION OF COPYRIGHT

SEC. 6. Section 302 of title 17 of the United States Code is hereby amended by adding at the end thereof the following:

"(f) MASKS.—Copyright in mask works endures for a term of ten years from the first authorized—

"(1) distribution;

"(2) use in a commercial product; or

"(3) manufacture in commercial quantities

of semiconductor chip products made as described in subclause (C) or (D) of clause 6 of section 106 of this title.".

INNOCENT INFRINGEMENT

SEC. 7. Section 501 of title 17 of the United States Code is amended by adding at the end thereof the following:

"(e) Notwithstanding the other provisions of this chapter, a purchaser of a semiconductor chip product who purchased it in good faith, without having notice of infringement (as that term is used in section 119 of this title), shall not be liable as an infringer or otherwise be liable or subject to remedies under this chapter with respect to the use or distribution of units of such semiconductor chip product that occurred before such purchaser had notice of infringement.".

IMPOUNDING AND SEIZURE

SEC. 8. Sections 503(a), 503(b), and 509(a) of title 17 of the United States Code are each amended by inserting "masks," after "film negatives," each place it appears.

EFFECTIVE DATE

SEC. 9. The amendments made by this Act shall take effect ninety days after the date of enactment of this Act, but shall not apply to—

(1) semiconductor chip products manufactured in the United State or imported into the United States before the effective date;

(2) masks made in the United States or imported into the United States before the effective date; or

(3) semiconductor chip products manufactured in the United States by means of masks described in paragraph (2) of this section.

SECTION-BY-SECTION ANALYSIS OF SEMICONDUCTOR CHIP PROTECTION ACT OF 1983

SECTION 1. TITLE OF THE BILL

Section 1 of the bill provides that the Act would be cited as the "Semiconductor Chip Protection Act of 1983."

SECTION 2. DEFINITIONS

Section 2 of the bill defines the terms "semiconductor chip products," "mask works," and "mask," and it amends Section 101 of the Copyright Code to include them. The bill also includes semiconductor chip products as "copies" under certain other sections of the Copyright Code. This is more economical of wording than it would be to insert the phrase "semiconductor chip product made as described in Section 106(6) of this title" or equivalent phraseology in each of the listed sections, but the effect is the same.

Semiconductor chips are defined as multilayer products etched into semiconductor material in accordance with a predetermined pattern, which are intended for use as electronic circuits, and which are writings or discoveries, or whose manufacture, use, or distribution is in or affects commerce. Mask works are defined as series of related images embodying the pattern of the surface of the layers of semiconductor chips. Masks are embodiments of the image used to etch a layer of a simiconductor chip.

SECTION 3. SUBJECT MATTER OF COPYRIGHT

Section 3 of the bill amends Section 102(a) of the Copyright Code by adding "mask works" as one of the specifically enumerated categories of copyrightable works.

SECTION 4. EXCLUSIVE RIGHTS

Section 4 of the bill amends Section 106 of the Copyright Code by adding to the present categories of exclusive rights under copyright law a new right as to mask works. The exclusive right of the owner of the copyright in a mask work is to embody the mask work into an individual mask, to distribute such masks, to use such masks to make semiconductor chips, to otherwise reproduce the images of the mask work onto material intended to be part of a semiconductor chip, and to distribute and use semiconductor chips so made.

SECTION 5. COMPULSORY LICENSING

Section 5 of the bill limits the exclusive rights of the owner of a copyright on a mask by requiring reasonable royalty compulsory licenses for bona fide purchasers, when they have already innocently committed substantial funds to the use of the chip and it would be inequitable not to permit them to continue their use of the chip in their product.

SECTION 6. DURATION

Section 6 of the bill limits mask copyrights to ten years.

SECTION 7. INNOCENT INFRINGEMENT

Section 7 of the bill adds, to present Copyright Code provisions as to innocent infringement of copyrights, a provision that innocent bona fide purchasers of semiconductor chip products are not infringers and are not liable to damages or other remedies for their innocent conduct. Innocent conduct is good faith purchase, use, or distribution of the product without knowledge that it is protected by someone else's copyright.

SECTION 8. IMPOUNDING AND SEIZURE

Section 8 of the bill amends the impoundment and seizure provisions of Sections 503(a) and (b), and 509(a), of the Copyright Code by including masks in the same category as plates, molds, film negatives, and other articles used to make infringing copies.

SECTION 9. EFFECTIVE DATE

Section 9 of the bill makes the Act effective in 90 days, but exempts previously manufactured products.

Detailed analysis

The bill amends the present copyright laws and adapts their remedies to protect semiconductor chips. Sections 2 and 3 of the bill add a new category of "work" to those works already protected under the Copyright Act. The existing Act, 17 U.S.C. § 102(a), protects literary works, musical works, dramatic works, choreographic works, pictorial works, motion pictures and other audiovisual works, and sound recordings. The bill lists "mask works" as an additional category of protected work. The bill's definition of "mask works" is generally parallel to the present Copyright Act's definitions of audiovisual works and motion pictures (17 U.S.C. § 101), i.e., as a series of related images. In the case of a mask work, these images are the images having the pattern of the various transitional or final layers of the semiconductor chip.

The bill defines "masks" as sheets respectively embodying one of the individual layer images making up the mask work. For example, one mask of the mask work would be that used to open holes in a silicon dioxide coating in order to admit "dopants" such as boron; another mask would be that used to configure an upper layer of aluminum in the chip for electrical contacts. Thus, a mask is related to a mask work as a single frame of a motion picture is related to the whole motion picture work or as a page or chapter of a book is related to the whole literary work.

Section 4 of the bill defines the exclusive rights accorded the owner of a copyrighted mask work. It does so by adding a further paragraph to present 17 U.S.C. § 106, which sets forth the exclusive rights enjoyed by the owners of the different types of copyrightable works that are presently recognized in the Copyright Act. The exclusive rights accorded the owner of a mask work are:

To make masks embodying the copyrighted work,

To distribute such masks,

To make chips with such masks,

To reproduce images of a mask work onto a layer of a chip; and

To use or distribute such chips.

The fourth of these exclusive rights is inclusive of all means of embodying the images of a mask onto a chip. This includes not only the use of masks to do so, but also the new technological process of impressing the image directly onto the chip with the aid of a computer-driven light beam. It is believed that this provision has sufficient breadth to cover foreseeable advances in chip manufacturing technology, so that pirates will not be encouraged to try to exploit loopholes in the law.

Limitations on these exclusive rights are imposed by sections 5 and 7 of the bill, and

existing copyright law. Section 5 provides a compulsory licensing provision for chips, under somewhat different procedures from the compulsory licensing provisions of section 115 of the present Copyright Act. The provisions of new section 119 of the Copyright Act, added by section 5 of this bill, apply to bona fide purchasers of infringing chips, who do not have notice or reason to believe that they are engaging in copyright infringement. Such bona fide purchasers may commit substantial funds to the development of a product built around the infringing chip, and it could work an undue hardship later to compel them to abandon manufacture of the product. An example might be a personal computer innocently designed around an infringing microprocessor chip. If the innocent infringer has the "equities" on his side, he becomes entitled under section 119 to a permanent, reasonable-royalty license as to the chip. In general, the concept of the balance of equities under new section 119 of the Copyright Act would be like that provided in section 252 of the Patent Act (35 U.S.C. § 252), which protects intervening rights of manufacturers of products that are subject to a reissue patent.

The reasonable royalty license applies to chips distributed or used after the bona fide purchaser acquires reasonable notice of copyright infringement. No royalty is required from the bona fide purchaser as to products already sold and gone before the bona fide purchaser had notice, or for other past conduct that is wholly completed before notice.

Similarly, persons further down the distribution chain have equivalent rights if they are bona fide purchasers. While each case must be decided on its own equities, it would appear that an ordinary consumer who was a bona fide purchaser should rarely or never be liable to pay anything, while a commercial user might well be obliged to pay something to continue his economically beneficial use of the infringing product. The question of royalty or no royalty merges into that of what constitutes a "reasonable" royalty for the use of the chip. That is a matter, in part, of the equities of the user, and in part of more objective question—usually posed as what a "willing purchaser" would pay a "willing seller" if they negotiated a license in good faith. This test or standard for "reasonable royalty" is described more fully in such decisions as *Horvath v. McCord Radiator & Mfg. Co.*, 100 F.2d 326 (6th Cir. 1938) ("that which would be accepted by a prudent licensee who wished to obtain a license but was not so compelled and a prudent patentee who wished to grant a license but was not so compelled . . . that amount which a person desiring to use a patented machine and sell its product at a reasonable profit would be willing to pay"), and other decisions construing 35 U.S.C. § 284. That section of the patent law provides that a patentee shall recover as damages "in no event less than a reasonable royalty for the use made of the invention." See also 28 U.S.C. § 1498, which requires the government to pay "reasonable and entire compensation" for the infringement of a patent or copyright, which compensation is generally equated to a "reasonable royalty." *Decca Ltd. v. United States*, 640 F.2d 1156 (Ct. Cl. 1980); *Leesona Corp. v. United States*, 599 F.2d 958 (Ct. Cl.), *cert. denied*, 444 U.S. 991 (1979).

The license under section 119 is to make, use and distribute the chip. Also, if the copyright owner and the copyright owner's licensees, if any, cannot supply the chip at a reasonable price, the licensee is free to purchase the chip from a nonlicensed source, at a reasonable royalty rate to the copyright owner. Again, the term "reasonable" as applied to price has the same meaning as it does with regard to royalty rate in the foregoing case law precedents.

Section 7 provides the further limitation on the copyright owner's exclusive rights that innocent infringers will have no liability at all. This provision is complementary to section 5 of the bill, and confirms that a bona fide purchaser need not pay any royalty or be subject to liability for conduct occurring before the bona fide purchaser had reasonable notice of copyright infringement.

Finally, the existing "fair use" provisions of section 107 of the present Copyright Act apply to the exclusive rights of a chip innovator. Accordingly, in the case of masks and chips, it is not an infringement of copyright to reproduce the pattern on the mask solely for the purpose of teaching, analysis, or evaluation, or to use the concepts or techniques embodied in the mask or chip, such as the circuit schematic or organization of components. That means that legitimate reverse engineering is not prohibited by the bill. Rather, the bill is directed at the appropriation of substantial parts of the drawings embodied in the masks and chips. It is possible, perhaps, that cases could be imagined in which it would be hard to draw the line between legitimate reverse engineering and the misappropriation forbidden by this bill. But as a practical matter, it does not make economic sense for a pirate to appropriate the fruits of a chip innovator's mask design labor unless the appropriation is wholesale. That is, to save the cost of making a set of masks the piratical copyist will want to make a photographic or nearly photographic copy of the original chip. Otherwise, the copyist will not ordinarily get the full benefit of the piracy and "free ride." Hence, it is unlikely that cases will need to be dealt with that are in a gray zone between clear copying and clearly legitimate reverse engineering. The lack of a bright line conceptual distinction between copying ideas (reverse engineering) and copying expression (piracy) is thus of little practical concern when most actual semiconductor chip fact situations are either at one end or else the other end of the spectrum.

It is the intent of this legislation that the Congress exercise its full powers in this field. In this regard, primary reliance is placed on the Congress' enumerated powers under Article I, Section 8, Clause 8 of the Constitution, which authorizes the Congress to regulate "writings." In order to insure full scope for the remedial provisions of the bill, however, reliance is also placed on the "discoveries" aspect of Article I, Section 8, Clause 8, and also on the Congress' broad power to regulate commerce under the Commerce Clause. This approach obviates any possible problems or speculations as to legislative power, such as those found in The Trademark Cases, 100 U.S. 82 (1879) (trademark act held unconstitutional because rested on Art. I, § 8, cl. 8, instead of on commerce power). Accordingly, even though it may be deemed that a chip is not a "writing," chips may be regulated and are regulated under this bill as useful "discoveries," or alternatively by the commerce power. As a practical matter, virtually any conduct relating to chip piracy will be in or will affect commerce. There is therefore no need to resolve possible speculation over whether chips should be regarded as writings, discoveries, or articles of commerce.

Cost of the legislation

It is estimated that the cost of the legislation will be insubstantial. The bill does not create budget authority or direct spending.

Regulatory impact statement

No significant additional regulatory impact would be incurred in carrying out the provisions of this legislation; there would not be additional impact on the personal privacy of companies or individuals; and there would be no additional paperwork impact.●