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Action:

Introduced by Mr. Mathias and Mr. Hart

By Mr. MATHIAS (for himself and Mr. HART):

S. 1201. 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

● Mr. MATHIAS. Mr. President, I have spoken many times in this Chamber and elsewhere about the need to bring our laws into step with modern technology. If new technologies are to thrive in this Nation, we must provide them with the protections they need to prosper. So, with that in mind, the Senator from Colorado (Mr. HART) and I are introducing the Semiconductor Chip Protection Act of 1983, which will provide the semiconductor chip industry with copyright protection against "chip piracy."

The semiconductor chip is the direct descendant of the giant computers of the 1940's. A Neanderthal like the 30-ton ENIAC was an enormous maze of flashing lights and vacuum tubes—it occupied the area of a small house. The newest breed of computer is typically a quarter-inch square of silicon wafer no bigger than a baby's fingernail. Yet, a chip can hold 100 times more electronic components than ENIAC—hundreds of thousands of components in all. And it works harder

and faster with fewer breakdowns and less energy consumption than its ancestor, at a fraction of the cost.

When we marvel at the wonders of modern technology, it is usually the work of the chip we are admiring. The microprocessor, the "computer on a chip," has made many of our modern day conveniences possible. The chip is in the home, making dinner in the microwave oven, setting the thermostat and tuning the radio; it is in the supermarket, adding up our purchases; it is in the car, controlling fuel consumption; it is in the hospital, helping doctors diagnose disease; it is in the schools, instructing our children; and it is in the office, doing the typing, the recordkeeping, and almost everything else. And, the microprocessor is the brain of the consumer product that may revolutionize the way we live today—the personal computer.

Chip designs are constantly being upgraded and refined. Every year engineers double the number of components they can fit on a chip—at present, they can accommodate more than 450,000. By 1990, they hope to squeeze 10 million transistors onto a single chip. As chips increase in complexity, we will find more and more ways to use them—some already in the experimental stage, and others as yet unimagined.

The chip will help translate into reality the science fiction dream of autonomous and semi-intelligent robots. Naval scientists hope that such robots will soon pilot ships, conduct rescue missions and retrieve valuable information from sunken vessels. Already, robots have been developed that can see, feel, and make simple deductions. A complex chip with a million transistors might help medical technologists perfect experimental devices which will help the blind see and the deaf hear. Computers will become increasingly "reasonable" and will operate more and more like the human mind. When personal computers are able to understand and respond to the human voice, they will be truly "user friendly."

But our progress toward these technological wonders may be delayed or frustrated if something is not done to protect the products of innovative chip designers from piracy and theft.

High tech firms spend huge amounts of time and money on producing semiconductor chips. Engineers design intricate layouts of circuitry analogous to the architect's blueprint. Like the architect, the chip designer must find the most elegant solution to a specified set of needs and problems. Concentrating hundreds of thousands of transistors into such a tiny space is in itself no easy task; the real challenge is in finding ways to maximize and diversify the electronic possibilities of the transistors.

Chip production is a fine and costly art. The design for the tiny chip is first laid out in a plan many feet square; then, small photographic "masks" are prepared, from which the image is transferred onto a silicon wafer, usually by a process similar to silk screening. Several layers like these are built up, and the chip is born. The entire procedure—from conception to completion of the chip—can take the innovating firm years, consuming millions of dollars and thousands of hours of the engineers' and technicians' time.

Yet, these innovators are being ripped off by onshore and offshore "chip pirates," who, for less than $50,000, can now legally appropriate and use these chip designs as their own. All they need do is buy a computer or other device on the open market, remove its chips, scrape off the protective plastic coating, photograph the circuitry, enlarge these photographs and study the designs in order to produce their own masks and thus their own chips. Then, the pirate firm can flood the market with cheap products. They can sell their products cheaply because they make them cheaply—after all, the innovating firm already paid the R&D costs. The high tech pirate, like any other, catches a free ride on the creativity, financial investment, and hard work of others.

That is why we are introducing this bill to give copyright protection to computer chip designs. Current law gives only very limited protection to semiconductor chips. Patent law can protect the basic electronic circuitry used in the chip, but not its carefully developed design. By giving chip engineers and manufacturers copyright protection for a 10-year period, this bill will protect their R&D investment. It will also protect innocent purchasers of pirated chips, by including a compulsory licensing provision allowing them to use that chip after paying a royalty to the innovating firm, thus eliminating any liability for innocent infringement.

Chip piracy reduces the incentive for our innovative semiconductor industry to invest in the development of new chips. Some may view my legislative response to the problem as protectionist, but I do not believe it is. I do not advocate protecting an industry collapsing under the weight of its own inefficiency, but I do believe that creative scientists and engineers must be protected from theft and exploitation. I advocate protections that will "promote the Progress of Science and Useful Arts"; the very "protectionism" that is incorporated in our Constitution, and on which all our copyright and patent laws are based.

The ingenuity of an age that has produced a tool as remarkable as the computer chip should be able to devise laws adequate to protect it. As Thomas Jefferson so wisely observed in our Nation's infancy:

• • • (L)aws and institutions must go hand in hand with the progress of the human mind • • • As new discoveries are made • • • institutions must advance also, and keep pace with the times.

Mr. President, Congressman EDWARDS and Congressman MINETA have sponsored H.R. 1028, legislation similar to the bill we are introducing today. On February 24, 1983, Congressman EDWARDS put an excellent legal analysis of the bill into the RECORD, at page H 643. I commend it to my colleagues here in the Senate.

Mr. President, I ask unanimous consent that the text of the bill be printed in the CONGRESSIONAL RECORD at the conclusion of my remarks.

There being no objection, the bill was ordered to be printed in the RECORD, as follows:

S. 1201

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. The copyright in a mask or mask work shall not extend to any other work of authorship embodied therein.

"As used in sections 109(a), 401, 405, 406, 501(A), 503, 506, 509, and 602 of this title, 'copy' includes a semiconductor 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—

(b) 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 work 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, substantially 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 subparagraph (C) or (D) of this paragraph.".

LIMITATION ON EXCLUSIVE RIGHTS AS TO MASKS

SEC. t. (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, subject to all of the following terms and conditions, and all of 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 and 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 chapter analysis for chapter 1 of title 17 is amended by adding at the end thereof 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 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 subparagraph (C) or (D) of paragraph (6) of section 106.".

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 any other provision 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 States 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.●

● Mr. HART. Mr. President, I am joining Senator MATHIAS today in introducing the Semiconductor Chip Protection Act of 1983. The main purpose of this bill is to extend the copyright law to protect semiconductor chip designs.

This bill is needed at this time because of the serious problem of piracy of semiconductor chip designs that U.S. semiconductor companies are experiencing. Such piracy is undermining the economic health and continued expansion of the innovative semiconductor firms and in doing so, threatens the overall competitive stance of the United States in the high tech revolution that is sweeping the globe.

In essence, the problem is that a pirate firm can duplicate the stolen design both quickly and cheaply, flooding the market with cheap copies of the chip and underselling the innovative originating firm. Eventually, the innovative firm can no longer continue to invest in development of new chips.

Right now, Federal law does little to protect them from such piracy and its adverse consequences. Semiconductor chip designs are now completely exposed, covered neither by patent nor by copyright protection.

This act gives America's innovative semiconductor companies the protection they need in two ways. First, it grants 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. This measure protects the substantial investments of innovating firms from misappropriation.

Second, the bill protects users of semiconductor chips from liability for innocent conduct. It also makes available to users compulsory reasonable-royalty licenses when necessary to protect their reasonable interests in their ongoing business activities as users of chips.

These two provisions can only be judged as fair and reasonable by those who understand the R&D intensive nature of the semiconductor industry. The semiconductor industry is too critical to America's economic future not to be granted such basic protection.●