

The Impact of Technology on Intellectual Property Law

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Intellectual property law is an important source of protection for new technology. It is an ancient body of law that protects original ideas, creative forms of expression, discoveries, inventions and trade secrets. This body of law, which dates back to at least the 1400's, is premised on the idea that to encourage innovation, persons responsible for discoveries and scientific advances should be rewarded. The rewards are limited monopolies accorded by patent and copyright laws and protection of business "know-how" by trade secret law.

Although American jurisprudence generally has an aversion to monopolies and the restriction of free enterprise, the limited exceptions embodied in intellectual property law have early beginnings in the American legal system. The founding fathers of the United States understood the need for some limitations on free enterprise to stimulate new ideas and scientific advancement. Therefore, they included a clause in the Constitution that states that Congress shall have the power "[t]o promote the progress of science in useful arts, by securing for a limited time to authors and inventors the exclusive right to their respective writings and discoveries."¹

The need for protection of intellectual property is critical today because of increased competition in both foreign and domestic markets. Additionally, the "pirating" of United States technology results in the loss of tens of billions of dollars to our economy. The economic benefits of technological innovations that result from research and development programs are quickly lost if intellectual property laws are not used aggressively. This problem is especially evident in the areas of electronics and computer technology. A company may invest heavily in the development of electronic equipment or computer software only to find other companies copying the equipment or software and selling them at greatly reduced prices because they do not have development costs to recoup. This competition, especially from foreign companies, has raised tremendous interest in intellectual property law. This has caused unprecedented Congressional action to expand and strengthen intellectual property protection during the past 12 years.

The copyright law, which had remained substantially unchanged since 1909, was supplanted by a new Copyright Act enacted in 1978². The Act was amended two years later by the Computer Software Act³ which made it clear that copyright extended to computer software. Subsequent amendments of the Act and the admission of the United States to the international Berne Convention have strengthened the protection provided by copyright.

The current patent law⁴, which had been enacted in 1952, was also substantially unchanged until the 1980s. During the past decade, the patent law has been the subject of numerous amendments. Additionally, the United States Patent and Trademark Office has undergone a substantial program to both modernize and improve its operation. This effort is being financed largely by dramatic fee increases charged by the Patent and Trademark Office which were intended to make the Office self-supporting.

The federal court system was also dramatically altered to strengthen patent protection. Prior to 1982, patent infringement disputes were litigated in United States District Courts. The trial court decisions were then subject to appeal to the appropriate United States Court of Appeals and certiorari was then available to the Supreme Court. Widely inconsistent interpretations of the patent law existed among the Courts of Appeals. Many of these different interpretations existed side-by-side because the Supreme Court generally failed to resolve these conflicts. Some federal circuits frequently invalidated a majority of the patents they reviewed. Additionally, situations existed where a patent could be held invalid in one federal circuit but it could continue to be valid in other circuits. The resulting lack of uniformity and predictability with regard to judicial treatment of patents substantially weakened the available patent protection. The patent system was also weakened by a generally hostile view of patents by many judges. This hostility was typified by Justice Jackson who stated in a dissenting Supreme Court opinion that "the only patent that is valid is one which this court has not been able to get its hands on."⁵

In response to the above problems, the Federal Courts Improvement Act of 1982⁶ made a dramatic change in the federal judicial system in an effort to strengthen the patent system. The Act created a new federal court called the Court of Appeals for the Federal Circuit which was granted exclusive jurisdiction over all patent appeals. The new court had thus far demonstrated a "patent-friendly" attitude which has greatly strengthened the patent law.

Congress also created a new form of intellectual property protection during the past decade. The semiconductor Chip Protection Act of 1984⁷ created a new body of law which provides protection for computer microprocessors. The effectiveness of this new law is still unclear, since there is a dearth of litigations involving it.

The judicial system also produced several landmark decisions relating to the protection of intellectual property. In *Apple Computer, Inc. v. Franklin Computer Corp.*,⁸ the Third Circuit declared that all forms of computer software were copyrightable. This decision, which has been universally followed, ended a dispute over whether certain types of software could be the subject of copyright

protection. However, the decision gave birth to the next generation of computer software litigation which is currently attempting to ascertain the scope of protection afforded computer software under the copyright law.

Copyright law protects the form of expression of an original work of authorship but not the underlying idea or information contained in the work of authorship. For example, if you write a book describing how to repair an automobile, anyone who reads the book is free to use the information learned from reading the book. However, they are not free to copy the book since the way the author has expressed the information is protected by copyright even though the underlying information is not protected. Application of these well-established copyright principles to computer software has raised some difficult issues.

One issue, which has resulted in lawsuits among various computer software manufacturers, is the scope of protection of the visual aspects of software that are produced on a computer monitor when the software is operated. Such visual aspects of software, referred to as the "look and feel" of the software, including the arrangement of data on a computer screen, menu configurations, command names, graphical interfaces and other audio-visual aspects produced by software. Many of the visual aspects of software have become standards in the industry, and consequently granting a software maker exclusive rights to a certain visual aspect of the software could greatly limit competition among software producers.

In 1981, the Supreme Court, in *Diamond v. Diehr*,⁹ created more uncertainty with regard to the protection of computer software. The Court decided that a novel process for curing rubber that depends on a computer to accomplish its objective was patentable. This decision finally abolished the long-standing practice of the Patent and Trademark Office of rejecting all inventions that involved computer software. However, the decision failed to provide clear guidelines for the patentability of software. Consequently, although a flood of software patent applications have been filed, numerous questions with regard to the patentability of software still exist.

The patent law provides that any new and useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof is entitled to patent protection. Typically, such protection entitles the inventor to the exclusive right to make, use or sell the invention in the United States for seventeen years. Despite the broad nature of the statute, a long line of judicial precedents have held that mathematical algorithms, mental processes or steps, and laws of nature are not patentable. It can be argued that computer software is nothing more than an algorithm or a series of mental steps. Consequently, under existing precedents the question arises whether patent protection of computer software is proper.

In *Diehr*, the invention involved a combination of a machine, which is traditionally patentable subject matter, and computer software. Based on this decision many software patent applications include physical hardware which is patentable subject matter. However, it is unclear how much hardware must be included with the software to render it patentable. Additionally, the required relationship between the hardware and software is uncertain.

In light of the above issues, the United States Patent and Trademark Office recently issues guidelines for determining the patentability of computer software inventions. However, there has been only limited judicial illumination of the issues raised by protecting software under the patent law. Therefore this will continue to be a ripe area for litigation.

The Supreme Court dramatically altered another aspect of patent law in *Diamond v. Chakrabarty*.¹⁰ In *Chakrabarty*, the inventor created a living, man-made micro-organism which had the capability of breaking down some of the components of crude oil. The micro-organism was designed to facilitate the cleanup of oil spills. The Court ruled that live, man-made organisms, such as the invention in question, were patentable subject matter. In the wake of this decision, the potential of moving from patenting man-made micro-organisms to patenting genetically engineered animals and ultimately genetically engineered humans became a possibility.

In 1988, the Patent and Trademark Office issued the first patent on a genetically engineered animal. The patent covered a laboratory mouse, engineered at the Harvard Medical School, that carried a gene rendering it susceptible to cancer and thereby making it useful for cancer research. Currently, more than 30 other animal patent applications are pending in the Patent and Trademark Office. Ongoing research promises to produce genetically engineered farm animals which scientists will design to exhibit desired properties such as improved disease resistance. To date, the Patent and Trademark Office has indicated it will continue to allow patents on genetically engineered animals although it would deny patents on genetically engineered humans based on 13th Amendment considerations.

Nevertheless, the patenting of genetically engineered animals created a storm of controversy among a wide range of interest groups. Corporations involved in animal research favor such patent protection. They argue there is a disincentive to develop new animal breeds if patent protection is unavailable. In contrast, small farmers believe such patent protection will ultimately increase the cost of farm animals which will further decrease the already dwindling number of family farmers. Some experts worry that the biological diversity of domestic breeds of farm animals will decline. They believe that animal producers will promote patented breeds in lieu of non-patented breeds due to the increased profit potential that can be generated by royalty payments for the use of patented animals. Ultimately, they believe many non-patented breeds could become extinct. Animal disease experts raise grave concerns about the lowered resistance of the farm animal population to disease if widespread uniformity among farm animals occurs. They worry that increases in the uniformity of the gene pool of animal breeds could allow a single disease to devastate the animal population. In response to the above concerns, several bills have been introduced in Congress. However, to date, legislation restricting the patenting of genetically engineered life-forms has not been enacted.

Intellectual property law, despite its ancient origins and long history of judicial precedents, has been dramatically affected by twentieth century technology. The ubiquitous computer and modern technological advances designed to alter and create life have created new questions to be resolved by Congress and the courts. The necessity of resolving these issues is especially critical, however, in light of the economic importance of technology to our economy.

Footnotes

1. U.S. Const. art. 1, sec. 8, cl. 8.
2. 17 U.S.C. sections 101 - 810 (1988)
3. Pub. L. No. 96-517, sections 10(a) - 10(b), 94 Stat. 3015, 3028 (1980)
4. 35 U.S.C. sections 1 - 376 (1988)
5. *Jungersen v. Ostby & Barton Co.*, 335 U.S. 560, 572 (1949)
6. Pub. B. No. 97-164, sec. 101, 96 Stat. 25 (1982)
7. 17 U.S.C. sections 901 - 914 (1988)
8. 714 F.2d 1240 (3d Cir. 1983)
9. 450 U.S. 175 (1981)
10. 447 U.S. 303 (1980)