Types of Intellectual Property

America's intellectual property laws have significance for engineers in their capacities as authors, inventors, and businessmen and women. Intellectual property, also sometimes called "industrial property," traditionally includes: (1) patents; (2) copyrights; (3) trademarks; and (4) trade secrets.1 It may also be used to encompass recent legal innovations, such as the maskwork protection available for integrated circuits.

A trade secret may consist of any confidential formula, device, or other information that may give someone an advantage over competitors; the classic example is the Coca-Cola formula. Unlike patents and copyrights, which are governed by federal law, trade secrets are protected under state law. A trade secret must be kept secret, and it can last indefinitely. By contrast, patents last 17-20 years, and copyrights typically last for the life of the author plus 50 years. An invention can be protected as a trade secret; however, such protection has the disadvantage that it can be lost if the invention is disclosed, independently invented, or even reverse-engineered by others.

A trademark is a word, phrase, symbol, or design that identifies the source of the goods or services and distinguishes them from goods or services of others. A good example is the Coca-Cola mark and design that appears on soft drink cans to identify products as coming from that firm, and which distinguishes them from competitor colas such as Pepsi. Unlike copyrights and patents, trademark rights can last indefinitely if the owner continues to use the mark. Trademarks are generally derived from state law, but may be registered federally in the United States Patent & Trademark Office (PTO). The term of a federal trademark registration is 10 years, with 10-year renewal terms being available.2

A relatively new type of intellectual property is the maskwork protection provided by the Semiconductor Chip Protection Act of 1984.3 This act provides a 10-year term of protection and is designed to prevent copying of the mask sets used for manufacturing integrated circuits.

A copyright is a right given to authors of "original works" which gives them the exclusive right to reproduce the work, prepare derivative works, or to perform or play the work publicly. While patents protect the substance of ideas, copyrights protect only the form in which ideas are "fixed." Under the federal copyright law,4 a copyright lasts from the moment the work is "fixed" in a "tangible medium of expression" and lasts for the life of the author plus 50 years, or a total of 75 years in certain cases where the employer owns the copyright.

Finally, a patent is a property right granted by the U.S. government to an inventor (or the inventor's assignee) to exclude others from making, using, or selling an invention.5

Useful brochures are available free of charge from the federal government covering some of these topics: Basic Facts About Patents; Copyright Basics (Circular 1); and Basic Facts about Registering a Trademark. The copyright brochure can be obtained by writing the Copyright Office, Library of Congress, Washington, DC 20559-6000, requesting Circular 1, or by calling 202/707-9100; for general information call 202/707-3000. The patent and trademark brochures can be obtained by writing the U.S. Department of Commerce, Patent and Trademark Office, Washington, DC 20231 or by calling the automated information lines at 703/557-INFO/4636.

Patent Protection of Inventions

The term of a patent has generally been 17 years; however, that term has been changed by Congress to 20 years from the date of filing, effective June 8, 1995. Under a patent, the inventor is granted a limited monopoly on the manufacture, use, or sale of the invention. One of the stated reasons for having a patent law is to promote the progress of science. If an inventor can receive a legal monopoly over an invention, she can obtain monopoly profits and thus have an extra economic incentive to attempt to invent. These inventions generally inure to the public benefit during the term of the patent (when sold to the public by the inventor under her monopoly), and also after the patent has expired and the invention enters the public domain.

In order to obtain a patent on an invention, the inventor must make a complete disclosure of the invention in a patent application. The application becomes public once a patent is granted, thus also benefitting the public by disseminating information about new ideas and discoveries that might otherwise be kept secret by companies. (However, although this is the stated motive behind patent laws, there is debate about whether science is really promoted by the grant of such monopolies and about whether or not such laws are morally justifiable in the first place.)6

Patent protection can be very important to engineers, inventors, and to many companies. The receipt of a patent over an invention provides significant protection, because others who wish to make, use, or sell the invention must obtain the right from the patent holder. Anyone
who makes, uses, or sells the invention without the consent of the patent owner can be sued by the patentee for significant damages. For many companies involved in research or development of patentable products, patents can constitute a substantial portion of their assets. For this reason, many firms actively encourage their employees to invent and reward them for doing so. (In this case, as discussed below, a company will usually own any inventions its employees make.)

There are three major types of patents: utility patents; design patents; and plant patents.

Utility patents may be granted to anyone who invents any new, useful, and nonobvious process or method, machine, manufacture, or composition of matter, or any new, useful, and nonobvious improvement thereof. A utility patent is the ordinary type of patent people think of that covers inventions such as new devices, new chemical compositions, or new processes or innovative ways of doing things. Design patents cover new, original, and ornamental designs for an article of manufacture. Design patents protect the appearance of an article. Plant patents are granted to one who invents or discovers and asexually reproduces any distinct and new variety of plant.

To obtain a patent, a patent application must be prepared and filed with the PTO, where it is examined by a patent examiner. The patent application contains a description of the invention and any drawings necessary to explain the invention, and it concludes with a set of claims. The claims define and stake out the legal boundaries of the invention for which protection is sought. If the examiner initially rejects the patent, the applicant, through a patent attorney, can attempt to overcome the rejection, either by modifying the patent to satisfy the examiner’s concerns or by arguing legally or factually with the examiner to convince the examiner that the rejection was erroneous.

This process of filing an application and going back and forth with the PTO in an attempt to obtain a patent is, strangely enough, called patent prosecution. Unlike trademark applications and copyright registration papers, which are sometimes filed by lay individuals, the preparation of a patent application is a complex task which normally requires the attention of a patent attorney or patent agent. The PTO cannot assist in the preparation of application papers and, indeed, strongly advises prospective applicants to engage the services of a patent attorney or agent.

A valid patent may not be obtained if, for example, the invention has been in public use or on sale in the U.S. for more than one year prior to the filing of the patent application. In addition to other formal requirements, the invention must be novel, have utility, and be nonobvious. Usually inventions can be shown to have utility or usefulness. However, not everything has utility—for example, “perpetual motion” machines that really do not work. Novelty means the invention must be new; i.e., it must not have been already invented, or anticipated, by a prior invention or by prior existing knowledge.

Under the nonobviousness test, an invention is not patentable over what was already known in the “prior art” if it would have been obvious at the time the invention was made (to a person having ordinary skill in that art) to make such changes in the prior art as to arrive at the current invention. Thus, even if an invention is novel, it might still not be nonobvious, because it could be that someone skilled in that type of technology could have relatively easily invented it if she had tried. Such an invention would be novel, but it might be considered obvious and, therefore, unpatentable.

Patent Protection for Software Inventions

The patentability of software inventions is one of the hot growth areas in patent law nowadays. In the past, the patentability of computer software was challenged on the grounds that software is nothing more than a series of mental steps or scientific principles. Mere scientific principles or abstract ideas are unpatentable, or nonstatutory subject matter. Until recently, software patents based on mathematical algorithms were thought to be unpatentable for this reason. However, the U.S. Supreme Court in 1981 held that certain processes are potentially patentable even if they include the use of a mathematical algorithm and a programmed computer to do the calculations.

Under current law, even if a computer program recites a mathematical algorithm, it may still be patentable (assuming it meets other requirements such as utility, novelty, and nonobviousness) if the computer program is operating on data that represent a real, physical phenomenon in the real world and produces an output that represents some real quantity, i.e., one which is not a mere abstract number. For example, if a program manipulates input data from a patient’s heartbeat, produces a signal related to the patient’s heart activity, and uses a computer to carry out the program, the invention for analyzing human heart electrocardiographic signals may be patentable even though the program carries out an algorithm.

Thus, until and unless Congress (or the courts) change the law, software inventions are patentable in certain cases. Although software may also be protected by design patents, copyrights, and trade secrets, each of these types of protection has disadvantages. Design patent protection can only protect design aspects of programs, such as the design of icons. Copyright protection is fairly easy to obtain, but it protects only the actual expression of the source or object code listing, not the inventive way of doing something that the software invention is directed to. Trade secrets may protect the inventive aspect of a program, but may be lost because of reverse engineering or independent discovery. A patent on a software invention, however, protects the invention itself and is not lost through reverse engineering or independent creation. Patent protection is potentially very powerful for commercial purposes.

Ownership of Inventions

Even though federal law governs the creation of patents, state law determines the ownership of patentable inventions. In other words, federal patent law determines whether a given invention is patentable and even who the inventor is; but state law determines who owns the patent—for example, an inventor/employee or her employer.
The law pertaining to patent ownership in employment relations is, however, fairly uniform from state to state. Normally, if an employment agreement has been signed in which the inventor/employee assigns all work-related inventions to the employer, the employer will own the invention in cases where the contract so specifies. In the absence of an employment agreement allocating patent rights, the default legal presumption in most states is that the actual inventor owns her own inventions, even if she is an employee.

An exception is made in hired-to-invent cases, where an employee is employed to do experimental work for inventive purposes. If an employee is hired to invent or is later directed to make a particular invention after already beginning employment, the resulting invention is usually considered to be the property of the employer. This is because it is presumed that, when inventive behavior is part of the employment relationship, the inventive behavior of the employee has already been fully compensated by wages. In other words, the law usually presumes that the employee and employer have (implicitly) bargained for the employee to "sell" to the employer all inventions in return for a salary.

Even when the employee owns the invention because there is no contract and she was not hired to invent, the employer may, in some circumstances, have a right to make and use the invention, typically called a shop right. The fact that the employee uses time that should have been devoted to the employer's affairs in perfecting an invention does not entitle the employer to the patent even if the employee has improperly used the employer's tools. However, if the employer's time or facilities are used without permission, and the employee invents a device that can be used in the regular business of the employer, the employer is sometimes given a nonexclusive license to manufacture and use the patented device or process. If the invention is made by the employee using the employer's facilities for the purpose of experimentation and invention in connection with the work for which she is employed, the employer can be awarded a nonexclusive license to manufacture and use the patented device or process in the regular course of the business in which the employee is employed at the time the invention is made.

Often disputes can arise over ownership of an employee's invention, especially when no contract has been entered into ahead of time. If the employer is awarded title to the invention, the employee may feel cheated out of her creation. However, when the employer and employee have failed to explicitly set out their rights by contract, the law cannot be blamed for attempting to deal with these situations based on general rules that appear fair for most situations. Anyone who does not wish to rely upon the general background of default legal rules that govern disputes in the absence of a contract is free to bargain for nearly any contractual relationship desired.

Employer Patent Programs

As mentioned above, employers often own their employees' inventions, either through an explicit contract or because the employee is hired to invent. A corporation, not being an actual person, can only obtain patent rights through purchasing them or by its own employees' efforts, so it makes sense for a company to arrange to receive title to its employees' inventions.

Because the intellectual property rights of many companies constitute a significant portion of their assets, firms often vigorously attempt to procure and protect intellectual property rights, such as patents and trademarks. Many companies have programs in which inventors are encouraged to prepare invention disclosure forms for all inventions they devise, so that they can be submitted to a patent attorney. The patent attorney will then consider the patentability of the invention and, if the invention looks promising, may prepare a patent application. Sometimes the inventors are even rewarded financially — for example, with a bonus for each patent disclosure prepared or for each patent application filed with the PTO.

Conclusion

Whether you or your employer owns your work-related inventions, the product of your mind may be protected under current law. If you own your own invention, and it is marketable and worth procuring patent protection, patent protection can be of immense benefit. If you are an employee and your employer owns your inventions, your inventions can still benefit you by benefiting your employer.

References

4. Title 17, U.S.C.
N. Stephan Kinsella practices computer-related patent law with Schnader, Harrison, Segal & Lewis in Philadelphia. Previously, he practiced oil & gas patent law in Houston.

Mr. Kinsella earned his B.S. in electrical engineering from Louisiana State University in 1987, where he served as a president of both the Tau Beta Pi and Eta Kappa Nu chapters. He worked simultaneously toward two graduate degrees at LSU, receiving his M.S.E.E. in 1990 and his J.D. in 1991. He earned an L.L.M. (master of laws degree) in international business law at the University of London, King's College London, in 1992.

He is the author of numerous legal articles on common law, civil law, federal law, and international law topics. Mr. Kinsella may be contacted at his firm at 1600 Market St., Suite 3600, Philadelphia, PA 19103-4252 or phone 215/751-2157.

Executive Council Meeting

The first regular meeting of the Great Lakes Executive Council was held in Romulus, MI, on December 10, 1994. The Council's first action was election of its and the Association's officers for the 1994-98 term. D. Beans, President; R. M. Basta, President-Elect; W. Beans, Vice President; and M. K. Brennan, Secretary of the Council.

A resolution was adopted authorizing President Basta and Vice President Beans to sign checks on the Association's operating account. The educational loan of a borrower was extended by the Council.

At the request of his collegiate chapter and advisory board, one member was appointed as installing deputy for the February 25 installation of the Washington Delta Chapter. Five members were appointed to the selection committee for the Tau Beta Pi scholarship. The selection committee has the responsibility of selecting five candidates to participate in the first national competition for the Tau Beta Pi scholarship.

Presentations of both prizes will be given at the awards banquet at the Annual Convention. The schedule of Spring District meetings was reviewed, and assignments were made to national-officer representation at all 14 of them. The Council made preliminary plans for the meeting of District Directors.

At the request of his collegiate chapter and advisory board, one alumnus was expelled from membership.

The Treasurer reported on the status of the 1994 Alumni Giving Program. The first-quarter financial report of the fiscal year had been sent to the Council and was accepted. A bequest of $99,300 in memory of Edward R. King, Jr., was appointed as District 3 Director for a three-year term to expire in June 1997.

The 1994 Convention held in October in Buffalo, NY, was reviewed and was judged to have been successful. In compliance with the 1981 Convention procedure for future site choices, the invitation from Minnesota Alpha to host the 1997 meeting in Minneapolis was accepted. The Council reviewed and adjusted plans for the 1996 Convention to be held in Cleveland, OH, on October 12-14. Assignments of items of business were made to various committees. Because only 105 chapters had voted, the deadline for ratification by the chapters was extended until February 28, 1995.

The Treasurer reported on the status of the 1994 Alumni Giving Program. The first-quarter financial report of the fiscal year had been sent to the Council and was accepted. A bequest of $99,300 in memory of Raymond A., NY '43, and Ina C. Best had been received. The Council approved a new trust fund and approved policies and procedures to grant fellowships to graduate engineers who are members of Tau Beta Pi to be used exclusively for the purpose of studying business administration at Rensselaer Polytechnic Institute and for acquiring master's degrees in business.

The contract with Epsilon Data Management, Inc., for conduct of the 1995 Alumni Giving Program was reviewed and approved. The contract with Epsilon Data Management, Inc., for conduct of the 1995 Alumni Giving Program was reviewed and approved. The contract with Epsilon Data Management, Inc., for conduct of the 1995 Alumni Giving Program was reviewed and approved.

Headquarters Visitors

Edward D. Basta, Ohio Epsilon '82, Chesterland, OH; June 2, 1994.
Deanna M. Chin, California Kappa '90, Camarillo, CA; June 4, 1994.
Russell W. Pierce, Washington Alpha '70, Cocoa Beach, FL; June 4, 1994.
Amar C. Hwang, Texas Beta '88, Potomac, MD; June 4, 1994.
Michael L. Peterson, Iowa Alpha '89, Clinton Township, MI; June 4, 1994.
Katrina Little, Chicago, IL; June 6, 1994.
Edward D. Basta, Ohio Epsilon '82, Chesterland, OH; August 12, 1994.

N. Stephan Kinsella