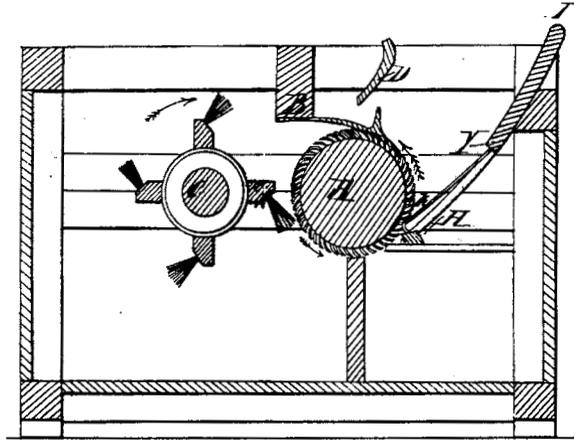


◆ INVENTORS AND INVENTIONS ◆

Eli Whitney

THE COTTON GIN



The first patent of major importance to be issued by the United States government after it was formed was Eli Whitney's patent for the cotton gin (gin is short for "engine"), which was issued on March 14, 1794. The patent description is in longhand, for reasons I cannot explain.

Upon graduating Yale as an engineer in 1792, Whitney, like many college graduates of today, found himself in debt and in need of a job. He left his home in Massachusetts and took a job as a teacher in South Carolina. That job fell through and Katherine Greene, the war widow of General Nathaniel Greene, invited Whitney to stay at her Georgia cotton plantation in early 1793. He noticed that long-staple cotton, which was readily separated from its seed, could only be grown along the coast. The inland-grown variety of cotton had sticky green seeds that were difficult to cull from the fluffy white cotton bolls, and thus was less profitable to grow and harvest. It took ten hours of hand labor to sift out a single point of cotton lint from its seeds.

Whitney, after observing the manual process being used for separating the sticky seeds from the cotton bolls, built his first machine, which did not work. The bulk cotton was pushed against a wire mesh screen, which held back the seeds while wooden teeth extending from a rotating drum pulled the cotton fibers through the mesh screen. However, this machine jammed. His next version incorporated thin wire hooks to replace the wooden teeth, and the collected fibers were cleared away by a moving brush. This second machine was successful.

According to some accounts, a question remains to this day whether Whitney or his employer, Mrs. Greene, was the "inventor" of the key element of the successful cotton

gin—the wire hooks. Some say the plantation foreman suggested to Greene that the wooden teeth be replaced by wires, and that Greene then told Whitney. Whitney supporters, on the other hand, cite a letter to the editor of *Southern Agriculturist* magazine, admittedly based on shaky sources, that Whitney specifically asked Mrs. Greene for a pin to use at the start of his experimentation. A factor tending to swing the pendulum toward Whitney was that before he left Massachusetts, he was the new country's only hatpin manufacturer.

In 1794, Whitney filed a patent application for his (or Greene's) cotton gin. He also gave a demonstration of his model to a few friends, producing in one hour a full day's output of several workers. The witnesses to this demonstration immediately had whole fields planted in green seed cotton. Word spread, and the farmers grew excited and impatient. Whitney's shop was broken into, and examinations made of his new cotton gin. Then, more fields were planted with cotton.

Before Whitney had a chance to prepare a patent model of his invention (required in those days), or to secure patent protection, the cotton crops were ready for harvest, and the planters did not have time to work within ethical or legal parameters. Whitney's cotton gin was simply pirated. Whitney and his partner, Phineas Miller, decided to build cotton gins and lease, not sell, them to the planters in exchange for one pound of every three pounds of cotton put through their machines. The planters revolted at this arrangement, as a virtual flood of white cotton was erupting from the Southern soil.

The partners, heavily in debt, were forced to approach the Southern courts to enforce their patent rights, which resulted in disaster. In 1801, they opted for grants from several Southern states, and in return, the cotton gin would become public property. One state accepted, offered \$50,000, made a down payment of \$20,000, and never paid the remainder. Eventually, Whitney and Miller received about \$90,000 from the states, which was used up immediately to pay legal costs and other expenses. In 1803, the states repudiated their agreements, and sued Whitney for the return of the money they paid previously. In 1804, Whitney petitioned the U.S. Congress for relief, and by one vote avoided financial ruin. At that point, he felt the past ten years were wasted. Whitney became discouraged with cotton, and left the South forever.

Upon returning to New Haven, Connecticut, he started manufacturing goods and developing mass production techniques and factories. In time, his manufacturing process developments changed the industrial capabilities of the North, just as his cotton gin had changed the face of the South.

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²
E. Whitney,
Cotton Gin.

2 Sheets - Sheet 1.

Patented Mar. 14, 1794.

Fig: 1.

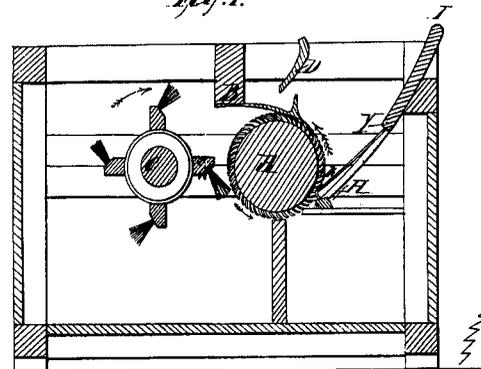


Fig: 21.

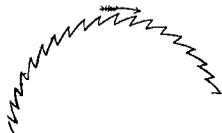


Fig: 22.

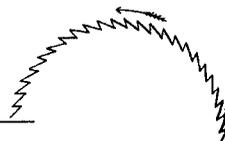


Fig: 23.

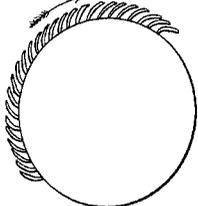


Fig: 2.

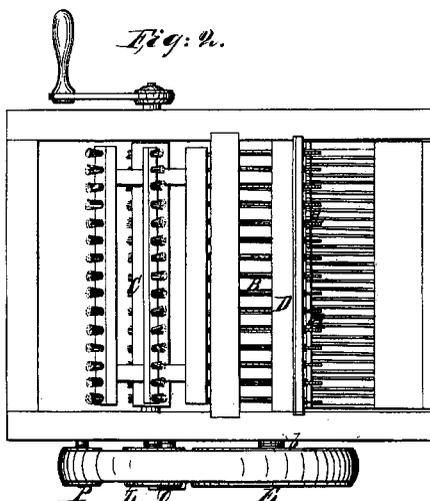


Fig: 24.

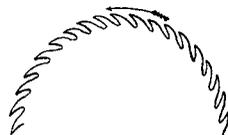


Fig: 25.

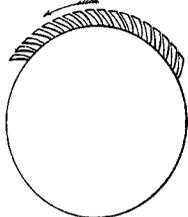
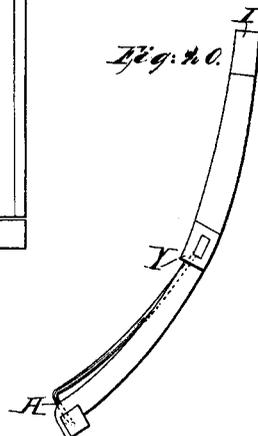


Fig: 20.



1 Overview of Intellectual Property Law

1.1 DEFINING “INTELLECTUAL PROPERTY”

First, we need to define the core term of our subject: “Intellectual Property.” The term Intellectual Property generically describes those intangible property rights—those you usually cannot see or touch—which are initially created by one’s intellectual creative efforts. The results of those intellectual efforts, in most cases, are then anointed with these intangible property rights which give their creator or owner the exclusive ability to control, and profit from, the results of this creativity. “Intellectual Property Law” is that field of law which defines those intellectual creations that are entitled to protection as intellectual property, how to obtain (or lose) those intellectual property rights, how to properly use and benefit from those rights, and how to obtain enforcement and compensation when those intellectual property rights are infringed upon by a competitor or other evil person. Intellectual property law also provides guidance to a competitor who desires to produce a new product or use a new process by designing around, and thus avoiding, the proprietary territory defined by your intellectual property rights.

Winning or losing out in business and financial opportunities sometimes heavily depends upon whether your creative output, inventions, products and business ideas and services are protected by patents, trademarks, copyrights, trade secret rights, mask work rights, and others. Commercially useful ideas, inventions, products and business services are the foundation of many highly successful businesses. As a result, successful business owners and entrepreneurs typically place a high value on the exclusive rights granted to intellectual property developed by their employees.

Businesses have succeeded or failed because of their owner’s efforts to protect their intellectual property, or their failure to do so. The value of many publicly traded companies has taken huge swings based principally upon whether the company has been successful in obtaining and enforcing its patent rights, for example. There are many common myths and understandings surrounding the need for and the difficulty in obtaining patent, trademark or copyright protection. Understanding the protection process and appreciating the valuable rights which can be acquired ensures that your intellectual property is protected, as well as that of your employer.

“Tangible” property includes things such as land, houses, jewelry, communication system terminals and networks, and even animals—things you can see and feel and physically possess. Intellectual property rights, on the other hand, are “intangible” rights which cannot be seen or touched, but they still exist, or can exist, if the rules laid down by centuries of intellectual property law are understood and followed. Intangible property, to be protectable, must ultimately be described or depicted in some tangible form, such as a description in a patent grant, or a work of art or manuscript of a book covered by a copyright

certificate. In each of these two examples, the law describes the intangible rights possessed by the owner and/or creator of a patentable or copyrightable work.

The building blocks of intellectual property law are patents, copyrights, trademarks and service marks, as well as anti-cybersquatting laws, trade secret protection laws, and mask work protection laws. These are all concepts that were created by legal systems in mostly all of the countries of the world, and although they are merely legal devices, they provide powerful instruments of protection for your intellectual creations. These systems of rights were developed to document the existence of intellectual property rights, how they can be protected, and to give the creator the right to exclusively use, own, transfer ownership, or license their rights of intellectual property.

In general terms, each intellectual property law system throughout the world provides a system devised to document enforceable protection for specific types of creative output, and to allow someone to own and transfer ownership in their intellectual property. For example, patents cover novel, useful and non-obvious machines; articles of manufacture; compositions of matter; ornamental designs; plants; manufacturing, electrical and chemical processes; and other methods, including software algorithms and methods of doing business. Patents also cover any improvement made to an article or process falling in any of the above categories. Copyrights cover the creative works of authors, composers, software developers, artists and the like. Trademark and service mark registration laws, as well as the common law, which I shall explain, protect the source identity of a product or service, such as the name and/or logo, and sometimes product configuration, under which one advertises and markets their goods or services to the trade or public. Trade secret protection laws prevent a competitor or another from misappropriation of valuable and confidential information which is not generally known or available to a competitor or to the public, such as a secret chemical formula or a secret process. Mask work protection is a recent intellectual property structural block, which provides exclusive rights in creative mask works used in the manufacture of semiconductors. In all, the specific nature and content of the results of your creative endeavors determines which vehicle or vehicles of the various intellectual property laws are best suited to protect the ultimate output of your efforts.

1.2 SPECIFIC INTELLECTUAL PROPERTY VEHICLES

1.2.1 Patents

A U.S. patent grant covering your invention can only be obtained from the United States government, namely, the United States Patent and Trademark Office, currently located across the river from Washington, D.C. in Arlington, Virginia. In foreign nations, patents are also granted only by the nation's government. Each country's patents are enforceable only in the issuing country and its territories. In the United States, the patent laws are found at Title 35 of the United States Code, a body of laws passed by the U.S. Congress, as mandated by Article 1, Section 8 of the United States Constitution. These U.S. laws define what can and cannot be patented, the conditions and requirements for obtaining a patent grant on patentable subject matter, the rights granted by a patent, the ability of a patent owner to enforce the exclusive rights embedded in the patent grant, and the ability of a patent owner to license or transfer ownership of the intangible rights embedded in the invention and patent grant for monetary consideration.

As mentioned briefly above, patents are granted on "new and useful processes, ma-

chines, manufactures or compositions of matter, or any new and useful improvement thereof". (35 U.S.C. §101). Designs of utilitarian articles of manufacture may also be protected by a Design Patent. Recent court decisions in the field of intellectual property law have held that anything "new" falling within the definition of 35 U.S.C. §101, quoted above, can be the subject of a patent. This includes new forms of animal life, for example, the Harvard Mouse, which is particularly susceptible to cancer and therefore valuable in research, and the modified *E. coli* bacterium, which produces insulin. More recently, novel and unobvious methods of conducting business have also been pronounced to be the subject of patents, as well as software under certain circumstances. By way of comparison, any material which appears naturally in nature cannot be the subject of a patent, since it was not "invented" by the alleged inventor. Pure ideas and concepts that have no "physical" embodiment are not protectable under the patent laws. However, as discussed later, a novel concept embodied in a new and useful device or procedure may come close to being fully protected by effective and creative patent application and claim drafting.

An issued patent grant describes and illustrates the covered invention, and its advantages over the "prior art," and also includes specifically worded "claims" which define the metes and bounds of the protection afforded by the patent grant. If a competing device or process falls within the definition set forth in a patent's claim or claims, or comprises equivalent structure, the competing device infringes the patent. But, I'm getting ahead of myself—the topic of patent infringement will be covered later.

1.2.2 Trademarks and Service Marks

Trademarks, services marks, collective membership marks, trade dress or product configuration, trade names and the like are directed toward the protection of the reputation and goodwill of the manufacturer of a product or a provider of services who uses a mark or symbol distinguishing the source of origin of its products or services from those of another manufacturer or service provider. These marks comprise a name, logo, symbol, product shape, container shape, or other distinctive and non-functional feature of a product or service which indicates that a certain supplier or group is the sole source for that particular brand of product of service, and the supplier or group stands behind the quality and reputation of the particular product or service. Rights in the mark are protected to avoid the likelihood of consumer confusion in the marketplace as to the source of the goods or services they purchase, thereby protecting the public against fraud by the second user of a mark.

A trademark or service mark registration application must be submitted to the government for Federal Registration, and sets forth both the identifying mark and those goods or services with which the mark is, or is intended to be, used. A trademark never stands alone. A trademark or service mark is always considered as an adjective, modifying the goods or services to which it pertains. Thus, Scotch tape is proper usage, as long as the Scotch is followed by the identifying word "tape." When used, a trademark or service mark should always be followed by the descriptive term of the associated goods or services.

Trademarks and service marks may also be protected in the U.S. and certain other common law countries without registration, if long usage and advertising of the mark has advised the public that the name or symbol has been adopted as a distinctive mark by its owner.

1.2.3 Copyrights

A copyright protects the expression of the authorship or artistic rendition of the author or creator, but does not protect the idea or concept upon which the expression is based. A concept for doing something cannot be protected by copyright, but the fixation or expression of that concept can be protected. For example, the concept of writing a book about tornado hunters is not protectable. However, a book or film about tornado hunters is a “fixation” of the author’s expression, and is protectable under the copyright statutes.

Copyright protection is normally easier and less expensive to obtain than either patent or trademark protection. Under existing law, the creator of a copyrightable work obtains an intangible copyright in the work upon the fixation of the work in a tangible medium of expression. To obtain a registration of that copyright, which provides tangible evidence of the existence of the copyright, a form setting forth among other things, the author’s name, the identity of the work to be protected, and its date of creation are submitted on an appropriate form to the Register of Copyrights, along with a deposit sample of the work. The Register of Copyrights works under the aegis of the U.S. Library of Congress. The application is subjected to an examination procedure, which is much quicker than the examination of patent or trademark applications, because there is no examination for novelty or likelihood of confusion compared to existing copyrighted works. The copyright application must indicate which portions of the work are original and which are not. This permits the public to ascertain which portions are protected and which remain in the public domain. Copyrights are used to protect books, films, videos, works of art, sculptures, and more recently choreography and software.

It is possible to overlap protection between the copyright and patent laws. For example, a novel, useful and non-obvious computer program may be protectable under both the patent laws and the copyright laws. The expression of an algorithm or formula can be protected as a literary work under copyrightable law. In addition, a novel method for controlling a machine by use of an algorithm may qualify for patent protection.

1.2.4 Trade Secrets

As discussed later in this text, patents and copyrights expire after a term of years, while trade secrets do not. As long as the information covered by a trade secret umbrella remains secret, that information is protected from improper discovery or use by others, unless it is independently discovered, as by reverse engineering, or otherwise made public by someone else. Where the secret is very difficult to discover and the owner is willing to maintain security to ensure its secrecy, trade secret protection is a valuable option and has no endpoint.

However, once the trade secret becomes known, there is no way to restore secret status. If the secret is discoverable upon reviewing the articles in which the secret is used, trade secret protection is useless. In such case, patent or copyright protection should be considered instead. Unlike patents and copyrights and trademarks, there is no Federal law regulating trade secret protection in the United States. Each state has its own trade secret protection law, and if it is determined that the best way to protect your intellectual property is through the trade secret law, an attorney familiar with this area of your state law should be consulted in the state or states in which you are operating. In the State of Illinois, where I practice, the State Legislature has enacted the Illinois Trade Secrets Act, which is current-

ly in effect. This Act sets forth what types of subject matter are considered as trade secrets, such as secret processes, formulas, customer lists, etc., and how they are protected. Even if a particular state has not enacted a statute granting trade secret protection, the common law may be available in that state to enforce trade secret rights once they are created against misappropriation.

1.2.5 Mask Works for Semiconductors

In 1984, the Federal Congress created a law to protect mask works used in creating semiconductor microprocessor chips. This law became part of the Federal Copyright Statute. In one of the later chapters of this text, I describe in detail how mask work protection can be obtained for semiconductor chips.

1.3 WHICH FORM OF INTELLECTUAL PROPERTY PROTECTION TO USE?

Depending on the nature of the technological project you are engaged in, one or several of the vehicles of intellectual property may be advisable to use. In some situations, you may not have any choice. If the subject matter of protection is a book or manuscript, patent or trademark protection cannot be obtained. For example, book titles other than periodical titles cannot be the subject of trademark registration, since each book title is descriptive of the precise book sold under that title. In some situations, multiple forms of protection will be available. For example, in the case of a novel form of packaging, both article and design patent protection may be available, covering a novel construction embedded in the packaging, as well as the aesthetic outward design of the package. Also, the name of the packaging would be susceptible to trademark protection, while the graphics used on the packaging label could be protected under the copyright laws.

Which protection to be used is a business decision that has to be arrived at by the creator or the owner of the invention or creative work. This decision should be made with the assistance of an attorney with experience in the intellectual property law field, and after the creator or owner has a full understanding as to the best vehicle or vehicles to be used for protection.