

Third Edition

*Includes coverage
of the
America Invents
Act!*

Patent Fundamentals for Scientists and Engineers



Thomas T. Gordon
Arthur S. Cookfair
Vincent G. LoTempio
Brendan S. Lillis



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Preface to the third edition

The U.S. Constitution granted Congress the power to enact laws to regulate and protect intellectual property. The first U.S. patent act was passed into law in 1790 during the height of the Industrial Revolution. Founding fathers like Benjamin Franklin and Thomas Jefferson helped write the first patent laws. Even though the basic tenets of those first U.S. patent laws still exist and form the basis of our current patent system, the patent laws have evolved and changed over the past two centuries.

The most significant overhaul of the American patent laws in decades occurred with the passage of the American Leahy-Smith America Invents Act (AIA) on September 16, 2011. The understanding of the law that dictates what a patent is, how a patent is obtained and enforced, and the recent changes through statute or case law litigation is an intellectual challenge. This edition of *Patent Fundamentals for Scientists and Engineers* will attempt to meet that challenge.

This book will provide the independent inventor as well as members of the scientific and business community—whether a scientist, engineer, supervisor, manager, or senior scientist—an overview of the patent system. This edition includes annotations of the recent law changes and case studies. It also provides a guide to assist inventors in dealing with the U.S. Patent and Trademark Office, as well as with patent professionals. The patent profession consists of attorneys and agents, whose duties are to evaluate the concept, prepare the application, prosecute the application, and obtain the maximum protection for the inventor. The inventor and the businessman should participate in all these steps.

The patent system is also designed to promote the incentive for others to improve on existing inventions and enlarge the field of technology. This is a vital aspect of our system and has been very successful in the 200+ years it has been in existence. Even with all the changes over the years the purpose of the U.S. patent system remains constant to foster advances in science and technology.

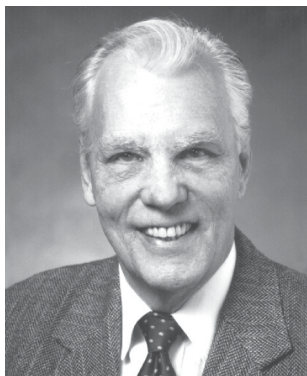
About the authors

The third edition of this book is dedicated to the memory of **Thomas T. Gordon**. Mr. Gordon and Mr. Cookfair were co-authors of the first and second edition of *Patent Fundamentals for Scientists and Engineers*. Following is Mr. Gordon's posthumous bio.



Thomas T. Gordon

After graduation from college with a BS in chemistry, Mr. Gordon worked as a chemist in the pharmaceutical and polymer industries. His graduate work was in organic chemistry, after which he studied law and earned a JD from St. Louis University. Mr. Gordon had over 40 years' experience in the patent field, working in various areas of patent preparation, searching, and prosecution. He conducted patent licensing programs in the United States and Europe and worked for major industrial corporations. He finished his career in private patent practice in the Arlington, Virginia, area.



Arthur S. Cookfair is a patent agent with more than 45 years' experience in patent law in both corporate and private practice. In addition, he has served as a patent examiner in the U.S. Patent and Trademark Office and is the author of numerous publications on patents and inventions. Based on his undergraduate work in chemistry and geoscience and graduate work in science and education, Dr. Cookfair has had a varied career as a chemist, educator, and patent practitioner. He has lectured and taught extensively on science and patent law in this country and abroad and has been the recipient of a Fulbright grant.



Vincent G. LoTempio is a registered patent attorney with the firm of Kloss, Stenger & LoTempio in Buffalo, New York. His practice focuses on intellectual property matters including patent, trademark, copyright prosecution, and infringement litigation. He earned a BS degree from Canisius College (Buffalo, New York) and a JD degree from Thomas Cooley Law School (Lansing, Michigan). Mr. LoTempio is a member of the New York and Florida Bar Associations, Erie County Bar Association Intellectual Property Committee, the Niagara Frontier Intellectual Property Lawyers Association, and the Rochester Intellectual Property Lawyers. Mr. LoTempio

is a consultant on patent issues to corporate and independent inventors. In addition, he has authored articles on patents in the *Buffalo Law Journal* and *Buffalo Business First* and he writes weekly articles on intellectual property in his personal LoTempio Law Blog. Also he lectures to businesses and inventors groups on how to identify and protect valuable intellectual property such as patentable subject matter.



Brendan S. Lillis is a registered patent attorney. He earned his JD from the State University of New York at Buffalo. He graduated from Syracuse University with a BS in computer engineering and has worked as a private software consultant in the health care industry. Mr. Lillis has developed and cofounded (with Vincent G. LoTempio) PatentHome.com, which serves as an educational resource for inventors to learn about intellectual property law through articles, audio recordings, and videos. Mr. Lillis is an avid speaker, conducting lectures on patent law to schools, corporations, and inventor's organizations. He is currently a private practitioner in the Buffalo,

New York, area, where he practices corporate and intellectual property law, specializing in software-related patent applications.

chapter 1

Patents as intellectual property

The Congress shall have the power...to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive rights to their respective writings and discoveries.

—The U.S. Constitution

In drafting Article I, Section 8, Clause 8 of the Constitution, the framers of that document achieved the dual purpose of establishing the basis for the U.S. patent system as well as the copyright system. The clause sets forth three balanced phrases—“science and the useful arts,” “authors and inventors,” and “writings and discoveries”—to refer to copyrights and patents, respectively. By focusing on the words *science*, *authors*, and *writings*, the clause may be read as follows:

The Congress shall have the power...to promote the progress of science...by securing for limited times to authors...the exclusive rights to their...writings.

These words provide the constitutional basis for our copyright system. (In the 1700s, *science* referred to learning or knowledge.) A shift to the alternate set of words—*useful arts*, *inventors*, and *discoveries*—provides the basis for the U.S. Patent System. The expression *useful arts* is simply an old-fashioned term for technology—the downstream useful product of science. The patent system applies to technology, not science. The word *discoveries* has been interpreted as meaning *inventions*. Thus, the constitutional basis for our patent system is found in the following words:

The Congress shall have the power...to promote the progress of...useful arts, by securing for limited times to...inventors the exclusive right to their...discoveries.

The language not only provides the authority for our patent system but also clearly establishes its purpose: not simply to protect the rights of the inventors but to promote the progress of technology—a broader, societal purpose.

Patents and copyrights are both categories that fall within the broader concept of intellectual property. The concept is termed *intellectual* because it applies to products of the mind, and *property* because those products belong to the person whose mental efforts created them. However, the concept of property also denotes ownership and exclusive rights. Since the property is mental, it is apparent that ownership and exclusive rights can be readily maintained only as long as the mental property is not revealed to anyone else. This leads to the dilemma recognized by Thomas Jefferson when he wrote the following:

If nature has made any one thing less susceptible than all others of exclusive property, it is the action of the thinking power called an idea, which an individual may exclusively possess as long as he keeps it to himself...

Jefferson recognized the problem that is addressed by the laws of intellectual property; that is, how can a person freely and openly put an idea to use, thus divulging it to others, and still retain exclusive rights to the idea?

Early in the 19th century Thomas Jefferson observed the difficulty in protecting an idea by providing exclusive rights to its originator or owner, and the concept of “intellectual property” has only recently become generally recognized. Until the late 20th century, the term was largely unknown, except to a few lawyers. Now it has become a major concern of the governments of the United States and other nations and an important consideration in international trade negotiations. Since Jefferson’s time, there have evolved, in the United States and other nations, bodies of law directed to the protection of that intangible property known as intellectual property (as opposed to tangible property, e.g., real estate).

Current authors now term Article 1, Section 8 the Intellectual Property clause of the Constitution.

In general, intellectual property laws are directed to the protection of rights arising from creative mental activities and are embodied in the laws (both statutory and common law) of trademarks, copyrights, trade secrets, and patents. Each of these categories includes a system of laws designed to protect a particular kind of intellectual property.

Trademarks

A trademark is a distinctive word or phrase, name, symbol, or device used to identify the source of goods in commerce. A trademark on a product serves to identify the manufacturer or seller and to distinguish it from the products of others. Trademarks are commonly used to identify a brand

of merchandise and may be used to promote a company's products and establish a symbol that can be utilized in advertising and marketing. The term *trademark* also encompasses service marks, which identify the source of services rather than goods.

The trademark is not used to identify a product—only the *source* of the product. Trademark is a source indicator. Thus, others may have the right to manufacture and sell an identical product, but not to use the same trademark (without permission) in connection with the product.

Trademark common law rights are established upon use of the mark in commerce, without a registration. However, a U.S. federal trademark registration on the Principal Register provides the owner with several statutory advantages, including the following:

- A legal presumption of ownership of the mark and exclusive right to use the mark nationwide on or in connection with the goods/services listed in the registration
- The ability to bring infringement action in federal court
- The ability to use the U.S. registration as a basis for registration in foreign countries
- The right to record the U.S. registration with the U.S. Customs and Border Protection Service (CBP) to prevent importation of infringing foreign goods
- The right to use the federal registration symbol ®
- Provide constructive notice of a claim of ownership of the mark to the entire world by publishing a listing of the mark in the U.S. Patent and Trademark Office's online databases

In the United States, the registration of trademarks is handled by the U.S. Patent and Trademark Office, the same federal agency that handles the granting of patents. There are approximately 1.7 million active registered trademarks on the principal register of the U.S. Patent and Trademark Office, with approximately 235,000 new registrations each year resulting from the about 400,000 new filings per year. The most up-to-date patent and trademark statistics can be obtained at <http://www.uspto.gov/about/stats/index.jsp>.

Unlike patents and copyrights, trademarks can remain in force indefinitely, subject to renewal every 10 years, provided the mark has been continuously in use. To maintain a trademark registration, a maintenance document called a Declaration of Continued Use or Excusable Nonuse under Section 8 (§8 declaration) must be filed before the end of the sixth year after the registration date and then again along with a renewal document called a combined Declaration of Continued Use and Application for Renewal under Sections 8 and 9 (combined §§8 and 9) before the end of the 10th year. A combined §§8 and 9 must be filed before the end of every 10-year period after the registration date or within the 6-month

grace period thereafter. Forms for filing the maintenance documents can be found at <http://www.uspto.gov/teas>.

Copyrights

Copyright laws are directed at the protection of the creative works of authors, artists, and others from unauthorized copying. U.S. copyright laws are constitutionally based and, along with patents, find their basis in Article 1, Section 8 of the Constitution. Although the original provision referred to authors and writings, Congress and the federal courts have interpreted it to include other forms of literary or artistic expression, such as musical compositions, dramatic works, maps, photographs, paintings, sculptures, and so on.

The subject matter that can be protected by copyright under present copyright laws includes the following:

- Literary works
- Musical works
- Dramatic works
- Pantomimes and choreographic works
- Pictorial, graphic, and sculptural works
- Motion pictures and other audiovisual works
- Sound recordings
- Computer programs

A copyright protects the manner of expression of an idea—not the underlying idea itself.

The registration of copyrights is administered by the Copyright Office, a division of the Library of Congress. The term of the protection of a new copyright is for the life of the author plus 70 years. When the copyright expires, the protected work can be freely copied or used by anyone.

Trade secrets

In a competitive industry, confidential information can be a valuable asset. Many businesses rely heavily on the confidentiality or secrecy of information relating to the manufacturing processes, product specifications, product treatment methods, and even customer lists and other business information to give them a competitive edge over others. Such information is often referred to as a *trade secret* and can be protected under the body of common law known as trade secret law. In contrast to patents, trademarks, and copyrights, which are governed by federal statutes, trade secret law falls within the jurisdiction of the states. Although there is no universal agreement on exactly what constitutes a trade secret, the most

commonly accepted definition is set forth in the legal reference work *The Restatement of Torts, Section 757*, which states the following:

A trade secret may consist of any formula, pattern, device, or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating, or preserving materials, a pattern or a machine or other device, or a list of customers.

Patents

Patent laws are the division of intellectual property laws that focuses on the protection of inventors. A patent is a grant by the government, to an inventor, conferring the right to exclude others from making, using, or selling his/her invention for a limited period of time. U.S. patents are granted for a period that begins at the date of issue and ends 20 years from the date that the application was filed.

The subject matter for which patents are granted includes invention of new and useful processes, machines, articles of manufacture, and compositions of matter.

Although trademarks, copyrights, and patents are all means of protecting intellectual property, the subject matter protectable by each is clearly different. However, the subject matter protectable by patents and trade secret laws overlaps considerably, and the ramifications of that overlap will be treated in further detail in a later chapter.

chapter 2

Patents

History, philosophy, and purpose

The patent system added the fuel of interest to the fire of genius.

—Abraham Lincoln

Patents, in terms of today's thinking, find their roots at least as far back as the 15th century. The city-state of Venice, which dominated the Mediterranean region during the latter part of the Middle Ages, adopted the first patent law. The preamble to that 1474 Venetian Patent Act set forth a philosophy that can be found in all modern patent systems: a recognition that the grant of exclusive rights to an inventor, for a limited time, will encourage others to invent.

It was under the Venetian system that Galileo applied for a patent in 1593 for his invention of a pump to supply water for irrigation. The pump required a single horse for power (one-horsepower pump) and discharged water through 20 spouts. The application was examined and a patent granted decreeing that for a period of 20 years, Galileo should have exclusive rights and that any infringer would forfeit the infringing apparatus and pay a fine of 200 ducats.

The granting of patents was practiced by other European nations, with variations in practice from country to country. Often, the practice was simply a method of rewarding friends of the ruler and was not primarily intended to reward creativity and encourage inventors.

The modern concept of a patent system began to take shape in England during the 16th and 17th centuries, but not without difficulty. Abuses were rampant during that period. Patents were often granted by the Crown for political or financial considerations. Exclusive rights were granted (or sold) to favorites of the court, giving them monopolies in certain commodities or services, often with no invention being required. Finally in 1624, in response to such abuses, the British Parliament adopted the Statute of Monopolies, which outlawed all royal monopolies except patent grants to inventors of new manufactures. The patent term was limited to 14 years and was granted only to the first and true inventor.

Immigrants from England brought the concept of patents to the New World, and the British experience provided a springboard for the