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Chapter 4: An Overview of Patents

I. History

Patents as a way for government to promote innovation by rewarding an inventor with a monopoly on his or her invention for a limited term predate the founding of the United States. The English Statute of Monopolies of 1623 provided an exception to its general condemnation of monopolies by providing the “true and first inventor” of a new manufacture up to fourteen years of exclusivity as long as “they be not contrary to the law nor mischievous to the state by raising prices of commodities at home, or hurt of trade, or generally inconvenient.”

With the new Constitution, the Congress was given the power “to promote the Progress of Science and the useful Arts, by securing, for limited Times, to Authors and Inventors, the exclusive Right to their respective Writings and Discoveries.”¹ the “Patent and Copyright Clause.” As the terms were used at that time, “science” referred to knowledge, and the “useful arts” are what we now call technology. One can see that there are two parallel themes running through the clause: science-authors-writings and useful arts-inventors-discoveries.

I.A. The Patent Act of 1790

The First Congress passed the first United States patent law during its second session, and President Washington signed it into law on April 10, 1790 (49 days before Rhode Island ratified the Constitution and became the thirteenth state). It authorized the granting of a patent for “any useful art, manufacture, engine, machine, or device, or any improvement therein not before known or used.” The invention also had to be “sufficiently useful and important.” The term for a patent was fourteen years, following the lead of the English Statute of Monopolies.

The decision to grant a patent resided with three cabinet members: the Secretary of State (Thomas Jefferson), the Secretary of War (Henry Knox), and the Attorney General (Edmund Randolph), collectively referred to as the Commissioners for the Promotion of the Useful Arts. The first patent, for a method for producing potash, was issued on July 31, 1790.

I.B. The Patent Act of 1793

It was difficult for the three cabinet members to find time in their busy schedules to decide whether a patent should be issued. In 1793, Congress passed a new patent law that went to the other extreme – no examination of an application was performed

¹ U.S. Const., Article I, §8.

before a patent was issued. That does not mean that all requirements for a patent were abolished. Patents were limited to “any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement on any art, machine, manufacture or composition of matter.” (The same language continues today as Section 101,² with the more contemporary term “process” replacing “art” in a 1952 recodification.) While the requirement that the patented invention had to be useful continued, it was no longer necessary that it be “important,” a difficult thing to decide at the time when something has just been invented.

Instead of examining a patent application to determine whether the invention met the requirements of the Act, it was up to the courts to declare a patent invalid if it lacked novelty or was not properly described in the application. As more patents were issued, this became a burden on the courts.

I.C. The Patent Act of 1836

The Patent Act of 1836 restored examination of applications before a patent was granted, but this time placed the responsibility with a Patent Office that was not charged with other responsibilities. It required that the applicant not only describe his or her invention, but include claim language to determine the scope of the patent. It required that the invention not be on sale or in public use at the time of the application, although in 1839 Congress amended the law to provide a two-year grace period before filing an application (shortened to the current one year in 1939).

The patent term of fourteen years could also be extended up to seven more years upon application to the Commissioner of the Patent Office. If there were objections to an extension, a board consisting of the Secretary of State, the Commissioner of the Patent Office, and the Solicitor of the Treasury would decide if an extension would be granted and the length of any extension. This was changed in 1861 to a fixed term of seventeen years.

I.D. Later Recodifications

In 1870 and again in 1952, Congress recodified the patent laws. These recodifications did not make major changes to the patent system established by the Patent Act of 1836 but clarified many of the Patent Office procedures (such as establishing a formal interference procedure when two applications attempt to claim the same invention) and incorporated (or, in some cases, altered) the various court decisions regarding the patentability of an invention and the requirements for receiving a patent.

In 1995, the patent term was changed from seventeen years from the issuance of the patent to twenty years from the filing date of the first application leading to the patent. Since the average pendency of a patent application at that time was under two years, this generally provided for an increased patent term. However, delays caused by the Patent Office could increase the pendency of an application to more than three years, resulting in a patent term of less than seventeen years. In 1999, Congress enacted the American Inventors Protection Act³ which guaranteed a patent term of seventeen years for diligent applicants.

² 35 U.S.C. §101.

³ Pub. L. 106-113, 113 Stat. 1501A-552.

II. Why Patents?

A patent is a way to get an inventor of a new device or method to reveal that device or method to the public, so that people can learn how to make and use it and possibly develop improvements. In trade for describing the invention in a publicly-available document, the patentee is given the exclusive right to make and use the invention for a period of time. But after the patent expires, anybody can practice (make, use, or sell) the invention.

Unlike trade secrets, which are protected because information is kept private, information about how to make and use a patented invention is made available to the public in trade for legal protection. Even the word “patent” means “open to the public, readily visible or intelligible,” and what we call a patent is really short for “letters patent” – an open government letter granting a privilege. Besides patents protecting inventions, there are also, for example, patents that convey land from the government to an individual or group.

Perhaps the best illustration of how a patent benefits the public by encouraging disclosure in return for a period of exclusivity is the plain-paper copier (the “Xerox machine”). Before the invention of that copier, copies had to be made using expensive and messy systems like photography, heat-sensitive paper, or mimeographs and ditto machines. That changed when a patent attorney came up with an electrostatic copying method. Because the patent attorney was the first to invent the technique, he received a patent giving him the exclusive right to practice the invention for 17 years. (The duration of a patent has changed somewhat since; it is now 20 years from the date the patent application is filed, extended if there are delays caused by the patent office.) During the patent’s term, the Xerox company was formed to build and market the patented copier, and if you wanted such a copier you could get it only from Xerox. By the time the patent expired, Xerox was an established company, and companies like IBM and Canon joined Xerox in building and marketing plain-paper copiers.

There are really three types of patents – utility, plant, and design. Our discussion will be limited to utility patents, which are the most common type. Design patents protect the ornamental design of an article and not its functions, and are therefore sort of a super-copyright for designs that are truly new and nonobvious, rather than just not copied, the requirement for copyright. Plant patents cover asexually-reproduced plants.

Unlike copyright, where legal protection comes into being when original expression is fixed in a tangible medium of expression, or trade secrets, which exist as long as they are kept secrets, patent protection requires the submission of an application to the United States Patent and Trademark Office (USPTO, also called the PTO or Patent Office), an agency in the Department of Commerce. The Patent Office examines the application and, if it is satisfactory, grants the patent.

III. What Can Be Patented

III.A. Basic Requirements

The requirements for a patent are given in Section 101 of the Patent Act:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful

improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.⁴

This language remains essentially unchanged from the Patent Act of 1793, except for replacing the word “art” with the more up-to-date term “process.” (In Section 100, a process is defined as a “process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.”⁵)

“Whoever invents” means that patents are granted to inventors, not to the companies that employ them, although the invention is generally assigned by the inventor to the employer. There is no automatic “work for hire” provision in the Patent Act, in contrast to the Copyright Act, although under common law the employer may have a “shop right” to use an invention that was developed using its resources. And in cases where it is clear that a person was employed specifically to invent the invention claimed in the patent, a court may find that there is an implied contract to assign the rights to the invention to the employer.

“Invents or discovers” requires that the patentee be the actual creator and not just the first person to come upon something that already exists, even though “discovers” makes it seem as though a person can get a patent on some naturally-occurring substance if he or she was the first person to find it. But courts have consistently held that one cannot get a patent on laws of nature or natural phenomena, even if nobody else has identified them before. Of course, one can get a patent on a new use for a law of nature or natural phenomenon, since any new invention has to follow the laws of nature.

The invention must also be “useful.” Usefulness, or “utility,” is not a hard test, but simply means that the invention does something desirable. The Patent Office invariably rejects applications for inventions that appear to be perpetual motion machines. A perpetual motion machine is one of the few inventions for which the Patent Office requires an operative model for the examiner to review. (Presumably, if the model does in fact run forever without additional energy, a patent would be granted.)

A more common example of an application that is rejected because the invention lacks utility is an application for a composition of matter with no known use other than the investigation of the properties of the composition. The same reason was used recently in rejecting an application filed by the National Institutes of Health for a collection of DNA sequences that had been isolated and identified by its investigators. Because the genetic meaning of the sequences was not known at the time of the application, there was no utility shown for the invention and the application was rejected. (The question of whether these naturally-occurring sequences were an invention was not addressed.)

Section 101 requires that the invention also be “new.” The concept of a new invention has two different aspects. First, the invention must be “novel,” which means that it has never existed before. But beyond that, it must not be “obvious” in light of what is known at the time of its invention. These concepts are key to determining whether a patent will be issued or is valid and will be discussed in detail later.

⁴ 35 U.S.C. §101.

⁵ 35 U.S.C. §100(b).

Patents can be granted for a “machine,” or mechanical device; a “composition of matter,” or chemical composition or other substance; a “process,” or method of doing something; or a “manufacture,” which is a catch-all category described in the congressional report that accompanied the passage of the Patent Act in 1952 as “anything under the sun that is made by man.”⁶ Patents can also be granted on an improvement to something in one of these categories. Essentially, anything technological is patentable subject matter. It is not necessary to state what category the invention falls into, although it is generally obvious.

Statutory subject matter must, of necessity, be expressed in broad terms. Because patents are granted for new technology, it is not possible for Congress to enumerate specific categories (such as software-based inventions) in the patent statutes. Such enumeration would necessarily mean that truly pioneering inventions that define a new field could not be patented, since their field would be added by Congress only after it was recognized. This would clearly be an unfair and undesirable result, and is prevented by the broad sweep of the statute. The same language has served for over 200 years, despite dramatic changes in technology.

III.B. Exceptions To The Broad Classes

Though the broad language of Section 101 does seem to cover “anything under the sun that is made by man,” there are a number of exceptions that are created by other statutes or by court decisions interpreting the language. A statutory exception prohibits patenting “any invention, or discovery which is used solely in the utilization of special nuclear material or atomic energy in an atomic weapon.”⁷

III.B.1. Laws of Nature

Laws of nature, natural phenomena, and naturally-occurring products are not patentable. Newton could not have received a patent on gravity nor Einstein on $E=MC^2$. That is because neither was the “inventor” of the law or product of nature. Even though the Patent Act uses the phrase “invents or discovers,” many court decisions have held that a naturally-occurring product cannot be patented, even by the person who first discovers it. To allow such a patent would allow the discoverer to control the making of the product, even though it happens naturally. It would remove the product from the public domain, contrary to the principles of patent law.

An alternative explanation of why first discoverers of naturally-occurring products, laws of nature, or natural phenomena cannot receive a patent on their discoveries is that the discoveries are not *new* processes, machines, manufactures, or compositions of matter. They may not have been known, but they existed before their first discovery.

One can receive a patent on a machine, manufacture, or composition of matter that is based on a law of nature. All machines must obey the laws of physics in their operation; compositions of matter must follow the laws of chemistry. One might even receive a patent on a naturally-occurring product that is changed to a substantially-different form, such as a biologically-pure strain of a microorganism. One can certainly receive a patent on a new use for a naturally-occurring product, although that patent would protect only the use and not the product itself.

⁶ Sen. Rep. No. 82-1979 at 5, H.R. Rep. No. 82-1923 at 6 (1952).

⁷ 42 U.S.C. §2181(a).

III.B.2. Abstract Ideas

Abstract ideas, such mathematical formulas, are not patentable. They are neither a process, machine, manufacture, nor composition of matter. They lack utility, since they have no particular use, much like a composition of matter whose uses are unknown.

The application of an abstract idea toward the solution of a problem results in something that is no longer an abstract idea. It could be a product (machine, manufacture, or composition of matter) based on the abstract idea or a process that employs the abstract idea to achieve a desired result, such as transforming a composition of matter to another form. Such applications of abstract ideas can be patentable if they are novel and nonobvious.

III.B.3. Mental Processes

A number of cases, such as *In re Abrams*,⁸ have raised the question of whether a mental process is statutory subject matter. At first reading of Section 101, it would seem that the answer is clearly yes because the four categories of statutory subject matter specifically include processes. The matter is not so simple. In the classic case of *Cochrane v. Deener*,⁹ decided in 1876, the Supreme Court stated:

A process is a mode of treatment of certain materials to produce a given result. It is an act, or series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing.¹⁰

The question is whether this is an exclusive definition of a process, saying that only acts that transform something are processes, or an inclusive definition, saying that there may be other types of processes in addition to those that transform something. This question has not been completely resolved, although *AT&T v. Excel Communications*¹¹ indicates that the definition is inclusive:

The notion of “physical transformation” can be misunderstood. In the first place, it is not an invariable requirement, but merely one example of how a mathematical algorithm may bring about a useful application. As the Supreme Court itself noted, “when [a claimed invention] is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of Section 101.” The “e.g.” signal denotes an example, not an exclusive requirement.¹²

A better way of viewing mental steps is that a process that involves steps that require a subjective or aesthetic judgment on the part of the person performing the process is not patentable. This is not because the process is somehow any less of a process as that term is used in Section 101, but because the disclosure requirement of Section 112¹³ has not been met. All patent applications must teach how to make and use the claimed invention. If judgments, rather than procedures that can be taught,

⁸ 188 F.2d 165, 89 USPQ 266 (1951).

⁹ 94 U.S. 780 (1876).

¹⁰ 94 U.S. at 788.

¹¹ 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999).

¹² 172 F.3d at 1358-1359, 50 USPQ2d at 1452 (citations omitted).

¹³ 35 U.S.C. §112, ¶1.

are necessary to carry out the process, then there hasn't been the required disclosure and the application is faulty.

III.B.4. Printed Matter

*In re Miller*¹⁴ and *In re Gulack*¹⁵ held that printed matter is not patentable because it is not a proper manufacture. The results of this rule are good, since it prevents patents from protecting writings more properly within the scope of copyright.

A better approach is to recognize that something that includes stored information, such as printed matter, is a manufacture, but to consider only the differences of the substrate carrying the printed matter and the prior art substrates when determining whether the invention is novel and nonobvious, unless there is some interplay between the substrate and the printed matter. But as we will later see, this approach is complicated by the requirement of Section 103 that claims be considered "as a whole" when determining whether an invention is obvious.

For example, consider Mark Twain's "invention" of *Tom Sawyer*. While the book is a manufacture, that manufacture differs from prior art books only in the writing in the book. The book would be statutory subject matter but would not be novel or nonobvious in light of other books.

III.B.5. Computer Software

There is quite a history regarding the patentability of computer software, discussed in the next chapter. Though a computer program per se is generally not considered patentable, today virtually any technique that can be embodied in a computer program that produces a useful result is patentable if properly described and claimed.

III.B.6. Methods of Doing Business

A number of older cases have held that methods of doing business are not patentable. What constitutes a method of doing business is a fuzzy concept, and most of the cases where it is discussed could have reached the same conclusion on patentability by using clearer concepts such as obviousness in light of the prior art.

Judge Newman, in her dissent in *In re Schrader*,¹⁶ described a method-of-doing-business exception as "an unwarranted encumbrance to the definition of statutory subject matter" that should be "discarded as error-prone, redundant, and obsolete. It merits retirement from the glossary of Section 101."¹⁷ But while Judge Newman's remarks were in dissent to the opinion of the court, the Federal Circuit's 1998 decision in *State Street Bank*¹⁸ cites her remarks with strong approval:

We take this opportunity to lay this ill-conceived exception to rest. Since its inception, the "business method" exception has merely represented the application of some general, but no longer applicable

¹⁴ 418 F.2d 1392, 164 USPQ 46 (CCPA 1969).

¹⁵ 703 F.2d 1381, 217 USPQ 401 (Fed. Cir. 1983).

¹⁶ 22 F.3d 290, 30 USPQ2d 1455 (Fed. Cir. 1994).

¹⁷ 22 F.3d at 298, 30 USPQ2d at 1461-1462 (Newman, J., dissenting).

¹⁸ *State Street Bank v. Signature Financial*, 149 F.3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998).

legal principle, perhaps arising out of the “requirement for invention” – which was eliminated by § 103. Since the 1952 Patent Act, business methods have been, and should have been, subject to the same legal requirements for patentability as applied to any other process or method.¹⁹

Business method patents are generally just a particular type of software patent, since the business method often relies on involved calculations that require the use of a computer in any practical application of the method, or involves doing something that enhances electronic commerce on the Internet.

IV. Getting A Utility Patent

Unlike copyright or trade secrets, patent protection exists only after the filing of an application, its examination to determine compliance with the statutory requirements, and the issuance of a patent. Section 111 requires that the patent application consist of three parts – a specification, drawings (unless there is no meaningful drawing possible for the invention, which is unlikely in most cases), and an oath by the applicant stating that he believes that he is “the original and first inventor” of the invention.²⁰

Although a written application must be submitted, it is generally not necessary to submit a working model. At one time, the submission of a model was required, but space considerations and the desirability of publishing the granted patents led to the dropping of the model requirement. Now, about the only time a model is required is when there is some question whether the invention will actually work, such as when it appears to be a perpetual motion machine. As stated in Section 114:

The Commissioner may require the applicant to furnish a model of convenient size to exhibit advantageously the several parts of his invention.

When the invention relates to a composition of matter, the Commissioner may require the applicant to furnish specimens or ingredients for the purpose of inspection or experiment.²¹

In fact, it is not even necessary to have a working model for the invention if the invention can be described in the application in such full and complete terms that somebody skilled in the art of the invention can make and use it from the application description. While this is seldom the case for a mechanical or chemical invention, for software-based inventions it is often possible to determine that the invention will function properly and describe it in detail without doing a complete implementation of the software. This is referred to as a “constructive reduction to practice,” as opposed to the “actual reduction to practice” that occurs when a prototype of the invention is constructed and tested to determine that it works as intended.

Section 112, first and second paragraphs, states the requirements for the specification:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full,

¹⁹ 149 F.3d at 1375, 47 USPQ2d at 1602.

²⁰ 35 U.S.C. §111.

²¹ 35 U.S.C. §114.

clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.²²

IV.A. The Description

The first paragraph is the description requirement. The description of the invention teaches how to make and use it and includes a brief abstract of the invention. The bargain in the granting of the patent is that the public receive a complete description of how to make and use the invention, so they can practice the invention without undo experimentation after the patent expires, or can understand it so they can develop improvements. The description must detail the best way that the inventor knows at the time of the application for making and using the invention (often called the “best mode” or “preferred embodiment” of the invention).

Sometimes an applicant includes only a description of the preferred embodiment in the specification, perhaps believing that other ways of practicing the invention are inferior and that their description should be unnecessary as long as the best mode has been described. This can cause a problem if the patent is litigated, because the court may see the patent covering only the single embodiment that was described, rather than a more general invention. To avoid this, an applicant should indicate alternative embodiments for components of the invention, even if these embodiments are not as good as the primary one being described.

Because patents are often the first description of a new technology, and there may not be accepted terms for key aspects of an invention, an applicant is allowed to use his or her own terms for aspects of the invention as long as they are defined in the specification. This is often stated as “A patentee can act as his own lexicographer.” These definitions should be clearly stated, especially if the term has a generally-accepted meaning that differs from the usage in the patent.

It is important that the same name be used for something throughout the patent, and particularly in both the description and the claims. This is not the place for using synonyms or shortened descriptions, lest there be confusion about the meaning of a term in the claims when they are being interpreted in litigation. If you call something a “left-handed framus” in the claims, make sure that wherever it is mentioned in the description it is also called a “left-handed framus,” not just a framus or a similar term like a “sinister framus,” even though most people in the art of the invention use the terms interchangeably.

IV.B. Claims

The claims define those aspects of the invention that are protected by the patent. It is not possible to determine what is protected by the patent from the title, abstract, or description. You must read the claims. But to properly interpret the claims, you

²² 35 U.S.C. §112.

must read them in light of the description and any statements made during the prosecution or examination of the patent application.

Almost without exception, a claim starts with a “preamble” that introduces the nature of the claimed invention and its environment, a “transitional term,” and one or more “limitations” or “claim elements.” A claim is always in a form that completes a sentence starting with “I claim” or “We claim” or “What is claimed is” or some similar phrase. It is never proper for a claim to be more than one sentence.

A special word that is commonly used in claims is “said.” Proper claim drafting requires that each aspect of a claim, such as a part of the claimed device, must be clearly recited before it can be used in a following claim limitation. For example, you must recite “a pencil comprising an eraser at one end” before you can talk about “the pencil’s eraser.” After introducing “an eraser,” you refer to it as “the eraser” or, more traditionally, “said eraser.” If there are two different erasers that are aspects of the claim, then you must always make it clear which one you are discussing, by using language such as “said eraser at said large end of said pencil,” if you have previously indicated that the pencil has a large end, or “said second eraser,” if you have designated each eraser by an ordinal.

Another special word in a claim is “plurality.” It means two or more and is used when it is necessary to differentiate the invention in the claim from prior art that has only a single instance of something. For example, if you claim “a plurality of computer processors,” the claim will cover systems with two or more processors, but not those with a single processor. One could achieve the same coverage by claiming a system with “two computer processors,” since a system with three or more processors clearly contains a system with two processors, but it is possible that the claim could be misconstrued in litigation as covering only two-processor systems, so “a plurality” or “at least two” is a better choice.

IV.B.1. When a Claim “Reads On” Something

The most important concept in understanding a claim is whether the claim “reads on” something. A claim reads on a physical object or a process when all the elements of the claim are components of that object or process. A claim also reads on a description of an object or process when all elements of the claim are described in the publication. (For simplicity, we’ll talk about a claim reading on a thing, where the thing can be a physical object, process, or description of an object or process, as appropriate.) Because the presence of an element in a claim limits the scope of that claim to things having that element as a component, claim elements are often also called “claim limitations.”

If a thing has components in addition to those of the claim limitations, it is necessary to consider the transitional term to determine if the claim reads on the thing. The most common transition term, “comprising,” means that the claim reads on the thing if all the elements of the claim are components of the thing, regardless of what other components may be present in the thing. (Sometimes “including” or “having” is used instead of “comprising.”) That means that the claim limitation “comprising A, B, and C” reads on every thing that has A, B, and C, even if the thing also has D through Z. A claim to a new type of screw using “comprising” as its transition term would read on a complete automobile if that screw were present anywhere as part of the car.

If a claim contains elements A and B, that claim does not read on a thing with just an A, an A combined with anything that is not a B, just a B, or a B combined with anything that is not an A. In other words, when the transition term “comprising” is used, a claim reads on any thing whose components are a superset (or are identical) to the elements of the claim.

One has to be careful when using the conjunction “or” with two claim elements. If a claim were written as “comprising A, B, and C or D” it would read on either a thing with A, B, and C or a thing with A, B, or D. That would make the claim invalid if there were something with A, B, or C in the prior art even if something with A, B, or D was novel. And unless there is a strong relationship between C and D, the patent office frowns on such claims.

Similarly, a claim like “A, B, but not C” might raise questions if C were not something that is a part of A and B, so that its exclusion (presumably because the only prior art with A and B also always includes C). The claim must still distinctly describe what is claimed, not what is not claimed.

There are two more restrictive transitional terms. The claim “*consists of* A and B” reads on things that have only A and B as their components, and absolutely nothing else. The claim “*consisting essentially of* A and B” reads on things that have A, B, and some other inconsequential components, such as noncritical impurities in a composition of matter. Because transition terms severely limit the scope of their claims, they are uncommon except in chemical claims where it is necessary to limit the claim to a particular compound.

It is important that you fully understand the concept of a claim reading on something. It is perhaps the most important concept in all of patent law. As we will see, a claim must not read on the prior art or that claim is invalid. And if a claim reads on something that is not prior art, that something infringes the patent.

IV.B.2. The Steps of a Method

It is not necessary to include every step of the method in the claims, since claims are not a description of how to implement the method. But the claims should include all the steps necessary to describe the claimed method.

Generally, there is no requirement that the steps of the claimed method be executed in the order specified in the claim for infringement to occur. All that is required is that, at some time, the infringing act must perform every step in the claim. However, where an order is specified, either explicitly (by using a connective like “and then” between two steps) or implicitly (as when one step requires information produced by another step), then those steps must be executed in the specified order. Similarly, if there is no particular ordering of the steps of a method desired, saying “comprising the following steps, in any order,” rather than simply “comprising,” will make that intention clear.

If only one embodiment of the claimed invention is described, or if all the embodiments show particular steps always being performed in a certain order, there is the possibility that the claim may be construed as requiring that particular order. If other orders are possible, examples should be briefly mentioned in the description.

IV.B.3. The Preamble

There has been a great deal of debate on whether the preamble of a claim adds limitations to a claim or simply provides the background for the claim. Does the claim “a widget, comprising A, B, and C” read on a non-widget that nevertheless has A, B, and C? It depends on whether the preamble is necessary to give meaning to the claim, and whether it was treated as a limitation during the examination of the patent application.

The best thing to do when writing a claim is to include in a preamble only what is necessary to provide an antecedent basis for a term used later in the claim, but which is not a part of the invention as being formally claimed. For example, if you are claiming a computer method for manipulating a data structure on a disk, you can introduce the disk in the preamble (“a method operating on a disk”) so that you can use it later when describing a step of the method (“storing information on said disk”).

Many claim drafters include in the preamble a short description of the purpose of the invention (“a method for secure communications”) or the name of what is being patented (“a widget”). This is not a good idea, since it might be read as a limitation. Instead, just say “a method” or “an article of manufacture” or some similar phrase that cannot possibly be interpreted as a limitation.

IV.B.4. Dependent and Independent Claims

There are two types of claims – independent claims and dependent claims. These are described in the third and fourth paragraphs of Section 112:

A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.

Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.²³

A dependent claim can be recognized because it starts with something like “a widget as in claim 1, further comprising D.” If claim 1 were for “a widget, comprising A, B, and C,” then that dependent claim would be identical to an independent claim reading “a widget, comprising A, B, C, and D.” (Think of a dependent claim as a macro, which replaces the introductory phrase with all the text of the claim on which it depends.)

The Patent Office likes dependent claims because they do not have to be separately examined for validity if the claim on which they are based is valid. That is because they always contain more limitations than their parent claim and can’t read on prior art if their parent claim doesn’t. (In the example above, if the prior art does not have widgets with A, B, and C, it certainly doesn’t have widgets with A, B, C, and D.) All the examiner needs to do is make sure they are in the proper form. Because of this, the Patent Office charges considerably less for examining a dependent claim.

Dependent claims provide a fallback position in case a claim is later found invalid by a court. For example, consider the independent and dependent claims above. If the independent claim reads on prior art, but the dependent claim doesn’t,

²³ 35 U.S.C. §112.

then the dependent claim survives and is treated as if it were written in full independent form. (It doesn't depend on the parent claim for its validity, just for the limitation to be included.)

Sometimes claim drafters will use dependent claims to indicate particular species of a general term. For example, if the parent claim has as an element "a computer network," then a dependent claim may state "where said computer network is an Ethernet" and another dependent claim may state "where said computer network is a token ring." Such dependent claims are often worthless as a backup position, however, if it would be obvious how to take a prior art teaching showing one species and implement the other species. For example, if a patent had claims like those described in this paragraph and prior art was discovered showing a token ring network (along with all the other elements of the claim), then the parent claim for a network in general, and the dependent claim for a token ring network, would both be invalid. But so would the dependent claim of an Ethernet, if it were obvious how to apply the teaching of a token ring network to an Ethernet.

A multiple dependent claim is something like "a widget as in claim 5 or claim 10, further comprising X." Because of the difficulty in checking that a multiple dependent claim, the Patent Office charges a surcharge for examining such a claim. For that reason, they are not commonly used. The fifth paragraph of Section 112 describes the special rules for multiple dependent claims.

IV.B.5. Other Claim Forms

It is generally improper to have a claim limitation that states alternatives. An exception to this is a "Markush claim," named after the applicant who first received approval to use such a claim. A Markush claim contains a limitation like "an R, wherein R is selected from the group consisting of A, B, C, and D" or similar language. There must be some property that unites the alternatives in a Markush claim. Not surprisingly, this type of claim is used primarily in chemical patents, where the alternatives are chemical elements or compounds that share a necessary property, such as being metals or rare earths.

Another special claim form is the "Jepson claim," where the preamble describes the old parts of the invention, and the limitations are drawn only to the improvement over the prior art. It is generally written like "a widget having A, B, and C, the improvement comprising D and E." The Patent Office prefers all claims to be written in Jepson format, because it makes it clear what the applicant feels is novel about the invention, but it is seldom used in practice. That is because if A, B, and C of the example are not really in the prior art, they will still be treated as prior art because the claim stated that they were.

IV.B.6. Means Plus Function Elements

Sometimes there is not a collective term for describing a particular limitation. This is addressed by the sixth, and last, paragraph of Section 112:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be

construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.²⁴

This was added to the patent laws to overturn a Supreme Court decision²⁵ that said that elements couldn't be described by the function they perform. Because such claim elements are generally written as "means for <some function>," they are generally referred to as "means-plus-function" or "means-for" claim elements.

It is important to note that the sixth paragraph makes it clear that the claim element does not cover *all* ways of performing the function, but only those described in the specification and their equivalents. For example, if the limitation is "means for fastening A to B" and the specification discloses that it is important that the fastening occur when the side of B opposite A is inaccessible and discloses nails and screws, then a bolt-and-nut combination would not be a means for fastening A to B, but a contact adhesive might be if it performs the same function as a nail or a screw.

Many people mistakenly think that a means-for claim element is very broad, but that may not be the case. It may be, instead, very narrow, depending on what was disclosed in the specification. The specification, for example, may disclose only one structure for performing the function, in which case the claim element covers only that disclosed structure and its equivalents. More important, the specification may not disclose sufficient structure, in which case the claim is invalid because it does not provide a definite indication of what is being claimed.

Because the sixth paragraph talks about "an element in a claim for a combination," it is improper to have a single-element claim with that element written in means-for form. Such a claim attempts to claim all ways of doing the specified operation, although it would be limited to the means described in the specification.

During claim interpretation during litigation of a patent, one of the jobs for the court will be to determine the structure that corresponds to the "means for" in a claim. Sometimes this is not easy, since the description of the means is spread throughout the description and is not clearly indicated. To aid the court (and to make sure its determination matches your intentions), clearly indicate in the description what you consider the means for performing a particular function, including any alternative means that you have briefly described.

During the examination of a patent application, the Patent Office used to consider the element as covering all reasonable means for performing the function rather than just those disclosed in the specification. This saved it from locating the descriptions in the specification, which could be a problem if it wasn't clear where something was being described (for example, if it was described in multiple places). That practice came to an end when the Court of Appeals for the Federal Circuit made it clear, in *In re Donaldson*,²⁶ that the sixth paragraph's requirement for the scope of the means-plus-function claim element had to be followed even during patent examination. There is still a tendency, however, for examiners to read the means-plus-function limitation as covering all reasonable means, but to limit its scope when the applicant points out that a particular implementation isn't within the scope of the means-plus-function claim element. That way, the fact that the claim doesn't cover

²⁴ 35 U.S.C. §112.

²⁵ *Halliburton Oil Well Cementing v. Walker*, 329 U.S. 1, 71 USPQ 175 (1946).

²⁶ 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994).

that particular implementation is on the record and the applicant can't later say that it is within the scope of the claim.

Means-plus-function claim elements are frequently used with claims for software-based inventions, since the claim covers the hardware that implements a particular function, whether it is special-purpose logic or a general-purpose digital computer programmed to perform the specified function. But again, it covers only the means described in the specification and their equivalents.

A less-clear concept also found in the sixth paragraph of Section 112 is that of a functional step, although such claim language is common in process patents and particularly in patents on software-based processes. There are few court decisions regarding "step-plus-function" claim elements; Judge Rader's concurrence in *Seal-Flex Inc. v. Athletic Track and Court Construction*²⁷ provides the best discussion. There, he draws the distinction between a claim element that recites an act, which would not be in step-plus-function form, and one that recited a function to be performed, which would be in step-plus-function form.

The distinction is subtle. An example of such a functional step limitation might be "computing a checksum for the packet," which would cover the ways of computing a checksum for a packet detailed in the description and their equivalents. In contrast, the step "computing a checksum for the packet using a table-lookup technique" specifies the act to be performed and therefore isn't in step-plus-function form.

V. Novelty

The Patent Act requires that an invention be "new" in order for a patent to be granted. To be new, the invention must be both novel and non-obvious when compared with the prior art at the time of its invention.

Section 102 states the requirement for novelty and defines what constitutes prior art. Its seven subsections include definitions both for prior art and for other things that will bar getting a patent.

V.A. Prior Art

Subsections (a) and (e) define true prior art, in that they are based on what was done or known by others before the invention by the applicant:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or . . .

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.²⁸

²⁷ 172 F.3d 836, 50 USPQ2d 1225 (Fed. Cir. 1999).

²⁸ 35 U.S.C. §102.

“Printed publication” has been interpreted to mean any written information that is accessible to the people who are most involved with the technology of the invention. It can include a typed manuscript that is cataloged and available in a library. It does not include information that is distributed on a confidential basis, such as a paper under review by a scientific journal or a proposal to the National Science Foundation.

There is no requirement that prior art be something that is still in use. Once something is prior art, it remains prior art forever. For example, an operating system technique may seem new because it is not used in current operating systems, but may actually be something that was implemented in an operating system no longer used, such as Multics. This prior art is often unknown to the applicant or the examiner, who may not be familiar with such historical systems, but is likely to be discovered by somebody being sued for patent infringement and wanting to invalidate the patent. Such searches are by their nature much more exhaustive than the one performed by the patent examiner, because the examiner’s search time is limited because he or she has to handle a number of applications in a timely fashion, and because doing a worldwide, in-depth search for prior art may be a small expense when the cost of patent litigation or having to abandon a product alleged to infringe a patent is considered.

There is no requirement that an applicant conduct any search of the prior art before filing a patent application. An applicant must bring to the attention of the examiner any prior art that is “material to patentability.”²⁹ Because any search cannot include patent applications that are pending but have not been published, nor consider every printed publication in the whole world, such a search can never determine with finality whether there is prior art out there. But it will prevent writing claims that read on the prior art that is discovered, allowing one to develop claims that have a better chance of being allowed with little or no amendment.

V.B. Inventorship

Note that while a printed publication anywhere in the world (and in any language) that occurs before the invention by the applicant is a bar to patentability, knowledge or use of a previously-invented version is a bar only when it occurs in the United States. But that does not mean that if you find something in a foreign country that is unknown in the United States, you can get a patent on it yourself. Subsection (f) limits patents to the true inventors:

A person shall be entitled to a patent unless –

(f) he did not himself invent the subject matter sought to be patented.³⁰

Because of Subsection (f), patents can be issued only to natural persons, not businesses, so there is no work-for-hire doctrine as in copyright law. However, employers generally require that employees who may invent something as part of their employment sign an agreement assigning any inventions to the employer. In the absence of such an agreement, an employer may own the invention if the employee was specifically “employed to invent” the particular invention, or was generally hired to develop patentable things. If the invention was developed using the resources of an

²⁹ 37 C.F.R. §1.56.

³⁰ 35 U.S.C. §102.

employer, but not as a specific job assignment, the employer may have a shop right to use the invention in its business.

It is important that only the true inventors be named on the patent application. Supervisors should be named only if they contributed to the invention, and not as a courtesy as is often the case with papers in scientific journals. Section 116 gives the special rules when there are more than one inventor:

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself and the omitted inventor. The Commissioner, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

Whenever through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application, and such error arose without any deceptive intention on his part, the Commissioner may permit the application to be amended accordingly, under such terms as he prescribes.³¹

Note that the last paragraph provides that inventorship can be corrected only if there was no deceptive intent. If the intent was to include a supervisor so that it seemed that he contributed when he really didn't, that may constitute deceptive intent and it may be impossible to remove the supervisor's name when it is discovered in litigation. And that may lead to the patent being declared invalid and unenforceable. The lesson is that only true inventors should be named in the application.

It may be that an inventor has assigned his inventions to his employer but then refuses to cooperate in applying for a patent, perhaps because he has left his job and is now working for a competitor. Section 118 addresses that situation:

Whenever an inventor refuses to execute an application for patent, or cannot be found or reached after diligent effort, a person to whom the inventor has assigned or agreed in writing to assign the invention or who otherwise shows sufficient proprietary interest in the matter justifying such action, may make application for patent on behalf of and as agent for the inventor on proof of the pertinent facts and a showing that such action is necessary to preserve the rights of the parties or to prevent irreparable damage; and the Commissioner may grant a patent

³¹ 35 U.S.C. §116.

to such inventor upon such notice to him as the Commissioner deems sufficient, and on compliance with such regulations as he prescribes.³²

V.C. Statutory Bars

There are a number of subsections of Section 102 that are statutory bars to receiving a patent, even if the invention was not known or obvious before it was invented. Subsection (b) is a composite of prior art and statutory bar, in that it addresses art that may exist after the date of invention, but before filing a patent application:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.³³

The purpose of Subsection (b) is to force the timely filing of a patent application after the completion of an invention. If an inventor were allowed to postpone filing an application indefinitely, he could wait until someone else was producing the invention and then file the application, effectively extending the time until the patent expired.

Most other countries do not provide this one-year grace period before filing an application, so it is important if you want foreign patents to file an application before publishing an enabling description (one that is sufficiently detailed to allow somebody to re-create the invention) or offering the invention for sale.

It is sometimes difficult to determine whether an invention is in public use. Court decisions have equated public use with commercial use, or use without an obligation of secrecy to the inventor. So, for example, in a classic case the Supreme Court found that the paving of a road with a new surfacing was not a public use, even though the public was driving over the road every day, because the paving was part of a test of the surfacing during a testing period controlled by the inventor.³⁴ On the other hand, at about the same time the Supreme Court found that the wearing of a corset designed for a woman by her boyfriend was a public use, because he placed no special restrictions on her use, even though the corset was not on public display.³⁵

Also note that the one-year clock is started when the invention is “on sale,” not when it is first sold. That means that an offer to sell the invention starts the clock. An interesting question is whether the clock starts if the offer is for an invention that has not yet been completed. In 1998, the Supreme Court held in *Pfaff v. Wells Electronics Inc*³⁶ that the on-sale bar applies when (1) the product of the invention is the subject of a commercial offer for sale, and (2) the invention must be so complete that it is “ready for patenting,” either because the invention has been completed or because there are “drawings or other descriptions of the invention that [are] sufficiently specific to enable a person skilled in the art to practice the invention.”³⁷

³² 35 U.S.C. §118.

³³ 35 U.S.C. §102.

³⁴ *City of Elizabeth v. American Nicholson Paving*, 97 U.S. 126 (1877).

³⁵ *Egbert v. Lippmann*, 104 U.S. 333 (1881).

³⁶ 525 U.S. 55, 48 USPQ2d 1641 (1998).

³⁷ 525 U.S. at 67-68, 48 USPQ2d at 1647.

Even if an invention is not in its final form, it still may be ready for patenting if a prototype works and the prototype contains all the claimed elements, or portions of the invention have been tested and it is clear that there will be no difficulty combining them to produce a complete working embodiment. For example, a proof-of-concept prototype of a software method would be “ready for patenting,” even if it is written to handle only one or two users at a time and may crash occasionally because it does not contain code to handle exceptional situations.

Along with Subsection (f), Subsections (c) and (d) are statutory bars to getting a patent if the inventor has abandoned the invention before applying for a patent, has applied for a patent in a foreign country more than a year before filing an application in the United States, or did not actually invent the claimed invention:

A person shall be entitled to a patent unless –

(c) he has abandoned the invention, or

(d) the invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States.³⁸

Applicants filing both in the United States and in foreign countries must be careful if they file first in the United States. Section 184 states:

Except when authorized by a license obtained from the Commissioner a person shall not file or cause or authorize to be filed in any foreign country prior to six months after filing in the United States an application for patent or for the registration of a utility model, industrial design, or model in respect of an invention made in this country.³⁹

The penalty for premature filing in a foreign country, given in Section 185,⁴⁰ is refusing to grant a United States patent on the invention or, if a patent issues before the premature filing has been determined, the invalidation of that patent.

V.D. Provisional Applications

Even though the United States provides a one-year grace period from the time an invention is described in a printed publication or offered for sale until a patent application is filed, it seems as though every patent agent or attorney has had a client who didn't realize that he or she needed to file a patent application until eleven months after the clock started running with a publication or offer for sale. A recent revision in the patent statute, providing for a provisional application, offers a way to get another year to file the actual patent application.

The rules for provisional applications are found in Section 111(b).⁴¹ A provisional application consists of a description of the invention (a specification), accompanied by any necessary drawings. There is no requirement that the provisional application contain any claims. The provisional application gives the applicant a “right of priority”

³⁸ 35 U.S.C. §102.

³⁹ 35 U.S.C. §184.

⁴⁰ 35 U.S.C. §185.

⁴¹ 35 U.S.C. §111(b).

with respect to prior art as of its filing date. In other words, the clock is stopped with respect to prior art as of the time of the filing of the provisional application for those aspects of the invention that are described in the provisional application.

Generally, there is little to be gained by filing a provisional application rather than a regular application. You still have to have a proper disclosure of the invention, such that a person can make and use the invention. And while you don't have to file claims with the provisional application, if you don't know what you are going to claim, it is very hard to know what to describe.

There are, however, two special circumstances where filing a provisional application may provide a substantial benefit. If you have published a paper and the one-year clock is about to expire, you can file that paper itself as a provisional application. (Remember, no claims are necessary.) To the extent that the paper would be prior art in its description of the invention, it is also an enabling disclosure of the invention. Filing the paper removes it from the prior art that can be considered against the actual application, which must be filed within a year of the provisional application.

A similar trick can be used when a software invention has been offered for sale and the one-year clock is about to expire. A copy of the source code can be filed, along with a brief description of the invention. The source code, obviously, completely describes how the software invention works, albeit in a less-than-convenient form. An actual application, filed within a year, can provide a more understandable description of the invention and how to use it. A difficulty with filing such a source-code provisional application is that it discloses not only the invention that may later be claimed but any trade secrets unrelated to the claimed invention that are also in the source code. But that may be a reasonable price for getting patent protection when it would otherwise be lost because of the statutory time bar.

V.E. Interferences

Finally, Subsection (g) is an exception to the United States rule that the patent goes to the first person to invent:

A person shall be entitled to a patent unless –

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.⁴²

There are two important times during the creation of an invention: when it is conceived and when it is reduced to practice. "Conception" marks the beginning of the inventive process, and occurs when the complete invention, such as the specific method for solving a problem or the overall structure of the device, is clear in the inventor's mind. It must be so complete that it is clear that it can be brought into existence and will work.

Obviously, because conception is in the mind of the inventor, it is difficult to prove precisely when it occurs. Because an inventor's testimony is likely to be self-

⁴² 35 U.S.C. §102.

-serving, objective evidence of the date of conception is generally necessary. The best evidence is an inventor’s notebook describing the invention, dated and witnessed by somebody who understands the invention.

An invention is not completed until it is reduced to practice, either by having a working prototype or by filing a patent application that enables the invention by describing how to make and use it so completely that a person with ordinary skills can reproduce the invention without undo experimentation. Reduction to practice by means of filing an enabling patent application is called “constructive reduction to practice,” as opposed to an “actual reduction to practice” when a prototype is constructed.

Under Subsection (g), if a person who isn’t the first applicant for an invention can show that he conceived the invention before the first applicant and has been diligent in completing the invention, then he is entitled to the patent for the invention. This is determined in an “interference” proceeding in the Patent Office, a hearing where both applicants present their evidence of their dates of conception and reduction to practice to administrative patent judges who determine which one should get the patent.

If an inventor has not been diligent in reducing the invention to practice, his date in the interference will be the date when he started his diligent reduction to practice, rather than his date of conception.

All other countries give the patent to the first inventor to apply for it, which simplifies determining who is entitled to the patent and promotes the prompt filing of a patent application. Although the United States has considered going to a true first-to-file system, rather than its current first-to-invent system, strong opposition from small inventors has blocked the change. But because documentation proving the date of conception is necessary to prevail in an interference, and many inventors do not keep the detailed notebooks required to prove their date of conception and continuing progress, most interferences result in the first applicant receiving the patent.

VI. Anticipation And Obviousness

If a claim reads on a single item of prior art – a printed publication or a product – then that item of prior art “anticipates” the claim must be rejected under Section 102. Sometimes, however, a claim does not read on a single item of prior art, but instead reads on a combination of two or more items. In that case, the claim may be “obvious” under Section 103:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.⁴³

Section 103 bars a claim if it is obvious based on a combination of two or more items of prior art, or differs in an obvious way from an item of prior art. To prevent the hindsight combination of prior art, using the claim as a roadmap of what to combine, there must be some teaching or other motivation in the prior art that would direct

⁴³ 35 U.S.C. §103(a).

someone to combine the references to get the claimed invention if he or she were aware of them.

An examiner, who generally has a degree in science or engineering (and in some cases, even a Ph.D. in the area he or she is examining), can also take notice that something is generally known in the field, although it is preferable to cite to one or more references. The references that the examiner has considered are listed on the first page of the patent.

VI.A. Secondary Considerations

Sometimes an examiner feels something is obvious from the references when it really isn't. The Supreme Court, in *Graham v. John Deere*,⁴⁴ has stated a number of things that can be considered when determining whether something was obvious at the time of its invention. These include:

- Commercial success caused by the invention, or lack of commercial success of prior art references.
- Long-felt need for something to solve the problem addressed by the invention.
- Unexpected results, such as an efficiency beyond what was felt possible.
- Failure of others to develop a similar invention.
- Copying of the invention by competitors.

There must be a connection between the success of the product using the invention and the invention itself; the success can't be due to superior marketing or similar considerations. And the independent development of the invention by others is an indication that the invention is obvious to those in its area, particularly when many people come up with the same invention.

VI.B. Rejection of a Claim

If the examiner finds that a claim is obvious or anticipated, the examiner will reject the claim, stating the particular prior art references that anticipate the claim or the multiple references that make the claim obvious, as well as a reason why those references would be combined by somebody with ordinary skills in the art of the invention. If the applicant does not agree with the examiner, he or she can respond with an explanation of why the examiner is mistaken and ask the examiner to reconsider the rejection. If the applicant agrees with the examiner's rejection but can claim the invention in a way that does not read on the prior art, such as by adding additional elements to the claim, the applicant can amend the claims and ask the examiner to consider the amended claims. Admissions made during the prosecution of a patent application will be held against the applicant when interpreting the claims during infringement litigation, or when determining whether a claim that is not infringed literally is infringed under the doctrine of equivalents.

Generally, an examiner will consider the application twice before making the rejection final. After a final rejection, the applicant can pay an additional fee to have the examiner consider further amendments or arguments for patentability, or can appeal the final rejection by the examiner to the Board of Patent Appeals and Interferences, an administrative review body within the Patent Office. If the decision of

⁴⁴ 383 U.S. 1, 148 USPQ 459 (1966).

the Board is unfavorable to the applicant, he can appeal to the Court of Appeals for the Federal Circuit or can sue in the District of Columbia federal court to order the Patent Office to grant the patent.

VII. Nature Of A Patent

The rights granted by the United States government to a patentee are:

a grant to the patentee, his heirs or assigns, of the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States, and, if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States, or importing into the United States, products made by that process, referring to the specification for the particulars thereof.⁴⁵

Originally, the rights granted were to exclude others from “making, using, or selling” the invention. Offering for sale and importing the invention were added to comply with an international trade treaty, although there was considerable support for their addition.

It is important to note that the rights are stated in a negative fashion – the patent owner can “exclude others.” It does not say that the patent owner can himself practice the invention. That is because his practicing of the invention may infringe on the rights to exclude held by another patent owner. As an example, if I hold the patent on television in general, and you later get a patent on color television, you can’t practice color television (or television in general) as long as my patent hasn’t expired, but I can’t practice color television as long as your patent is in force. When my patent expires, you can practice color television (and anybody else can also practice television), but I still can’t practice color television.

Sometimes one patent blocks practicing (making or using) a second patent, while that second patent blocks practicing the first patent. In that case, neither patent owner can practice his invention until the other patent expires, and so it is likely that the two patent owners will cross-license their patents, giving each the ability to practice their patents.

VII.A. Patent Term

The term of a patent used to be 17 years from the time the patent issued. That was recently changed to 20 years from the date of the first application leading to the patent, to prevent people from keeping a patent pending by delaying tactics until the technology had matured and people were using the invention, then having the patent issue and collecting royalties from those who had independently developed the invention. These are referred to as “submarine patents,” and some applications were kept pending for two decades or more.

There are a number of instances where delays in the prosecution of the patent application don’t count against the 20-year term. These are detailed in Section 154.⁴⁶

⁴⁵ 35 U.S.C. §154(a)(1).

⁴⁶ 35 U.S.C. §154.

Most important, if an applicant does not delay the examination of the application, he or she will receive a full 17-year patent term.⁴⁷

VII.B. Presumption of Validity

One of the benefits of a patent is the deference given by the courts to the judgment of the examiner:

A patent shall be presumed valid. Each claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim.⁴⁸

The presumption of validity means that courts will not substitute their judgment for the examiner's unless there is clear and convincing evidence that the examiner was wrong. That means that it is difficult to find a patent invalid on the basis of prior art that was considered by the examiner, but less difficult when there is newly-discovered prior art. Because of that, it is to the benefit of a patent applicant to supply the examiner with all prior art that will have a bearing on the patentability of the invention. It is also a Patent Office rule.⁴⁹ And if it is found that an applicant hasn't been forthcoming with prior art, or has misled the examiner, the patent can be declared invalid for "fraud on the Patent Office" (the old term) or "inequitable conduct" (the term in current favor).

Note that claims are individually valid, and the invalidity of a parent claim does not make its dependent claims invalid. That is because the dependent claims don't depend on the parent claim for their validity but simply for some of their language.

VIII. Infringement

A claim is infringed when it reads on the alleged-infringing article or process. A claim reads on something when all the elements of the claim are present in that something. It is only necessary to infringe one claim of a patent for the patent to be infringed.

Section 271(a) indicates that infringement occurs when one of the rights to exclude is violated:

Except as otherwise provided in this title, whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.⁵⁰

Subsection (b) also extends infringement beyond direct infringement:

Whoever actively induces infringement of a patent shall be liable as an infringer.⁵¹

Subsection (c) covers contributory infringement:

⁴⁷ 35 U.S.C. §154(b)(1)(B).

⁴⁸ 35 U.S.C. §282.

⁴⁹ 37 C.F.R. §1.56.

⁵⁰ 35 U.S.C. §271(a).

⁵¹ 35 U.S.C. §271(b).

Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.⁵²

In patent litigation, it is common to make a claims chart that shows each element of each claim that is being infringed, and then indicate which aspect of the infringing device or method corresponds to each element in the claims chart. If there is any element that does not have a corresponding aspect in the alleged-infringing device or method, then the claim with that element is not literally infringed.

VIII.A. Nonliteral Infringement

A claim may be under the “doctrine of equivalents” infringed even if it does not literally read on a thing. For example, if the claim is to A, B, and C, and the alleged-infringing thing has A, B, and D, there is no literal infringement. However, if D performs substantially the same function in substantially the same way to get substantially the same result as C, then there may be infringement under the doctrine of equivalents. The extension of a claim under the doctrine of equivalents is limited by “prosecution history estoppel” (sometimes called “file wrapper estoppel”) – if during the prosecution of the patent application the applicant has limited a claim to avoid prior art, it cannot be extended to what was previously disclaimed.

Two recent decisions dramatically limit the scope of the doctrine of equivalents. It may not be possible to assert the doctrine of equivalents to cover disclosed but unclaimed embodiments.⁵³ And in light of the Supreme Court’s decision in *Festo*,⁵⁴ the doctrine of equivalents likely does not capture subject matter that the patent drafter reasonably could have foreseen during the application process and could have been included in the claims.

For example, if an application originally claimed a container with a slot and then, to avoid prior art, the claim was modified to “a slot at the top of the container,” the doctrine of equivalents would not reach a container with its slot on the side near the top, even though it performed the equivalent function.⁵⁵ That is because it was foreseeable that the amended claim limitation did not include slots in positions other than the top of the container.

However, if an application filed before the invention of the transistor had its claims amended to include the terms used to describe parts of vacuum tubes (such as “cathode,” “grid,” and “plate”), then a circuit that performs the same function in the same way to get the same result but is implemented using transistors might be

⁵² 35 U.S.C. §271(c).

⁵³ *Johnson & Johnston v. R.E. Service*, 285 F.3d 1046, 62 USPQ2d 1225 (Fed. Cir. 2002).

⁵⁴ *Festo v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, __ U.S. __, 62 USPQ2d 1705 (2002).

⁵⁵ *Sage Products v. Devon Industries*, 126 F.3d 1420, 44 USPQ2d 1103 (Fed. Cir. 1997).

covered by the doctrine of equivalents, since it would have been impossible at the time the claims were written or amended to use the corresponding terms that describe the parts of a transistor. The applicant could not have foreseen a limitation as to after-invented technology, was not disclaiming that technology, and should not be held to such a disclaimer under prosecution history estoppel.

VIII.B. Patent Misuse

Subsection (d) indicates that a number of acts that might otherwise be an antitrust violation are not when a patent is involved:

No patent owner otherwise entitled to relief for infringement or contributory infringement of a patent shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of his having done one or more of the following: (1) derived revenue from acts which if performed by another without his consent would constitute contributory infringement of the patent; (2) licensed or authorized another to perform acts which if performed without his consent would constitute contributory infringement of the patent; (3) sought to enforce his patent rights against infringement or contributory infringement; (4) refused to license or use any rights to the patent; or (5) conditioned the license of any rights to the patent or the sale of the patented product on the acquisition of a license to rights in another patent or purchase of a separate product, unless, in view of the circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned.⁵⁶

But that is not to say that a patent owner can do anything he wants without concern for violating the antitrust law. Use of the rights under the patent to extend it to cover things not within the scope of a patent, such as licensing a patent only if you will buy the raw materials needed to practice the invention, can be an antitrust violation and make the patent unenforceable until the antitrust violation ends.

VIII.C. Marking

Even though patents are publicly available, it is not reasonable for a person to know what is covered by every patent. Section 287(a) provides that an infringer will not be liable for damages unless he has received notification of the patent. But that notice can come with the filing of an infringement suit, so that it will cover future infringements only, by a letter informing you of the patent, or by seeing a product covered by the patent marked as patented.

Patentees, and persons making, offering for sale, or selling within the United States any patented article for or under them, or importing any patented article into the United States, may give notice to the public that the same is patented, either by fixing thereon the word "patent" or the abbreviation "pat.", together with the number of the patent, or when, from the character of the article, this can not be done, by fixing to it, or to the package wherein one or more of them is contained, a label containing a like notice. In the event of failure so to mark, no damages shall be recovered by the patentee in any action for

⁵⁶ 35 U.S.C. §271(d).

infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice.⁵⁷

VIII.C.1. "Patent Pending"

Often you see a product marked "patent pending" instead of being marked with a patent number. This means that a patent application has been filed and is being examined by the Patent Office, but no patent has issued. The patent pending marking is simply a warning that a patent may issue that covers some aspect of the product, and that at that time people who are making unauthorized copies of the product can be forced to stop. Because patent applications used to be kept secret by the Patent Office, and still may be if the applicant requests and has not filed a foreign patent application, it was impossible to know what the pending application claimed, and so a patent pending mark would create sufficient uncertainty to discourage the investment in producing unauthorized copies of the product.

The Patent Act provides penalties for falsely marking a product as patented or as having a patent pending. Section 292 covers false marking:

(a) Whoever, without the consent of the patentee, marks upon, or affixes to, or uses in advertising in connection with anything made, used, offered for sale, or sold by such person within the United States, or imported by the person into the United States, the name or any imitation of the name of the patentee, the patent number, or the words "patent," "patentee," or the like, with the intent of counterfeiting or imitating the mark of the patentee, or of deceiving the public and inducing them to believe that the thing was made, offered for sale, sold, or imported into the United States by or with the consent of the patentee; or

Whoever marks upon, or affixes to, or uses in advertising in connection with any unpatented article, the word "patent" or any word or number importing that the same is patented for the purpose of deceiving the public; or

Whoever marks upon, or affixes to, or uses in advertising in connection with any article, the words "patent applied for," "patent pending," or any word importing that an application for patent has been made, when no application for patent has been made, or if made, is not pending, for the purpose of deceiving the public –

Shall be fined not more than \$500 for every such offense.⁵⁸

Any person, not just the patent owner, can sue for false marking, in which case half the penalty goes to the person suing and half goes to the federal government.

⁵⁷ 35 U.S.C. §287(a).

⁵⁸ 35 U.S.C. §292.

VIII.D. Penalties for Infringement

VIII.D.1. Damages Recoverable

As with copyright infringement, there are a variety of penalties for infringing a patent. The recoverable damages are described in Section 284:

Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court. When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed. The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.⁵⁹

The reason for the treble damages is to prevent people from infringing when they don't want to pay royalties and then when they are found to have infringed, having to pay only the royalties that they were avoiding. Damages are generally tripled when the infringement is found to be willful – the infringer was aware of the patent but infringed it anyway. Note that there is no equivalent to the Copyright Act's statutory damages in the Patent Act.

A troubling aspect of the tripling of damages for willful infringement is that it seems to punish a person who tries to be aware of the patents that are being issued and reward those who ignore patents until they receive actual notice that they may be infringing a particular patent. But it is hard to see a court punishing an infringer for making a good-faith effort to avoid infringing patents, including studying patents as they are issued, when there would be no punishment if they had made no effort at all.

Other penalties for infringing a patent include injunctions to stop future infringement⁶⁰ and attorney fees in exceptional cases.⁶¹ Note that unlike willful copyright infringement, patent infringement carries no criminal penalties.

VIII.D.2. Provisional Rights

There can be no infringement until a patent is issued, which often takes two years or more after an application is filed. But a recent change in the Patent Act, as part of the early publication of patent applications, allows a patent owner to collect a royalty for acts that would infringe the patent when it has issued. These “provisional rights” are detailed in Section 154(d),⁶² and are available between the time of the early publication of the patent application, as provided for in Section 122(b),⁶³ and the issuance of the patent.

In order to collect those royalties, the person who is violating the provisional right must have actual notice of the published patent application. That generally means that the patent applicant must send a copy of the published patent application

⁵⁹ 35 U.S.C. §284.

⁶⁰ 35 U.S.C. §283.

⁶¹ 35 U.S.C. §285.

⁶² 35 U.S.C. §154(d).

⁶³ 35 U.S.C. §122(b).

to the person violating the provisional right, to simplify proving that the violator has actual notice.

The early-publication provision calls for the publication after 18 months of any application, unless an applicant requests that the application not be published and that application is not filed in a foreign county. But it also allows for publication earlier than 18 months at the request of the applicant. This can be useful when there is no concern about the early disclosure of a patent application, such as when the invention is being sold, marked as patent pending, and it is reasonably clear what such a patent might claim. In that case, an applicant should request publication as soon as the patent application is filed, so that provisional rights will be immediately available.

But even though the provisional rights begin at the time the application is published, they are not available to an applicant until the patent based on the application is issued. If, for some reason, no patent issues from the application, then there will be no provisional rights even though the application has been published.

Because claims are often amended during the examination of a patent application, provisional rights are available only when a published claim is substantially identical to a claim in the issued patent. If a claim is substantially changed, it will be necessary to have the application republished and new notice provided to a person thought to be violating the provisional rights.

IX. What To Do If You Are Told You Are Infringing a Patent

IX.A. Reviewing the Claims

The first thing you should do when you are notified that you may be infringing a patent, or suspect that that might be the case, is to review the claims of the patent in light of its prosecution history (which may give particular meaning to claim terms or otherwise limit the claims) to see if all the elements in the claims are components of the alleged infringing product. A patent attorney should be consulted to interpret the claims and, if infringement is not found, to provide a written opinion of why each claim of the patent is not infringed. (That will make it difficult to show willful infringement if you continue making or selling the product and a court later determines that your interpretation of the claims is incorrect.)

IX.B. Three Choices

If a claim of the patent does read on your product, you have three choices (besides ceasing to make and sell your product). You can try to negotiate a license with the patent owner, possibly cross-licensing a patent that you own that may be useful to the patent owner. (Many companies get patents not for stopping their competitors but as bargaining chips in negotiating cross-license agreements.) You can read the claims carefully to determine if there is some change you can make to your product such that the claims no longer read on your product because one element is missing or different in your product. (This is called “inventing around” the patent, and while it sounds like a sneaky thing to do, it is actually encouraged by the patent laws because it results in new ways of doing things. But you have to worry about continued infringement under the doctrine of equivalents if your change is minor.)

Finally, you can try to invalidate the patent. This is difficult because the presumption of validity of a patent means that your evidence must meet a high standard. For example, you can't just say that the disclosure isn't enabling because deference is given to the examiner's determination that it is enabling, as indicated by the lack of a rejection for that reason. The examiner's decision that the claimed invention is not anticipated or made obvious in light of the prior art considered (and listed on the first page of the patent) is also given high deference. But prior art not known to the examiner cannot receive the same deference because it clearly did not form a part of the examiner's decision to grant the patent. So trying to invalidate a patent generally results in a search for prior art not considered by the examiner and clearly different from the prior art that was considered.

IX.C. Reexamination

Any prior art discovered in such a search can be used as a defense in an infringement suit against you, as the basis for filing a declaratory judgment action to find the patent invalid if you have received a letter from the patent owner sufficiently threatening of an infringement suit, or to have the Patent Office reexamine the patent in light of the newly-discovered prior art. To have the Patent Office order a reexamination, you have to raise a new issue of patentability, which generally means that you have found new prior art and are not just saying that the examiner misapplied the prior art that he considered.

Until a recent change in the patent statute, most people avoided reexamination since they could play no role in it beyond their original request, and in particular could not point out misconceptions on the part of the reexamination examiner. The give-and-take of the reexamination was entirely between the patent owner and the examiner. And any prior art supplied as part of the reexamination request became essentially useless in later patent litigation, since the presumption of validity now applies to that prior art as well as the prior art considered during the original patent examination.

The patent statute was changed in 1999 to permit the reexamination requestor to participate in the reexamination by providing written commentary on the actions of the examiner and the responses of the patent owner. Further changes were made in 2002 to give the requestor the same appeals rights as the patent owner. Previously, while either party could appeal the examiner's decision to the Board of Patent Appeals and Interferences, only patent owner could further appeal the decision of the Board to the Court of Appeals for the Federal Circuit.

The reexamination provision prevents you from using anything that you could have brought up at the time of the reexamination in later litigation. Because of uncertainty about the scope of this bar, reexamination may be undesirable unless you have prior art that you are sure will invalidate the patent, or at least cause new claims that will not concern you.

Another change allowed the reexamination to be based on prior art already considered by the examiner, as long as a "substantial new question of patentability" is shown. But Congress made it clear that this is not a way to second-guess the examiner.

However, this bill is not a license to abuse patentees and waste the life of a patent. The point must be stressed that the past requirement of 'a substantial new question of patentability' has not been diminished.

The issue raised must be more than just questioning the judgment of the examiner. There should be substantial evidence that the examiner did not properly understand the reference, or did not consider a portion of the reference in making his decision. That substantial new question must be put forward clearly in the request for reexamination. The bill preserves the necessary safeguard in the Patent Act against harassment of patentees with the safety-valve of a 'substantial new question of patentability' standard, not merely 'any sort of question.' The agency has discretion in this determination to permit reexamination, but it is not absolute. While the bill clarifies the basis for a reexamination determination and removes the overly-strict bar established by the court, which renders the available process useless in many obvious instances such as with previously considered prior art, the courts should judiciously interpret the 'substantial new question' standard to prevent cases of abusive tactics and harassment of patentees through reexamination.⁶⁴

Though each revision to reexamination makes an important improvement, there are still problems that keep people from taking advantage of reexamination as an alternative to litigation. Perhaps Congress will see this as reason to institute a simplified early reexamination, such as an opposition period for a short time after the issuance of a patent to weed out patents where the best prior art was unavailable to the examiner.

⁶⁴ H.R. Rep. No. 107-120 at 3.