

# Patents

## What is a patent?

A patent is a government-granted right to exclude others from making, using, selling, or offering for sale the invention claimed in the patent. In return for that right, the patent must completely disclose the claimed invention sufficiently to allow “one skilled in the art” to practice the invention. The scope of coverage of a patent is defined by the claims in the patent, supported by the specification (written description) and drawings. Patent claims are the numbered paragraphs drafted by patent attorneys, with input from the inventors, which provide the legal definition of an inventor’s protectable invention.

A patent does not necessarily provide the holder any affirmative right to practice a technology because it may fall under a broader patent owned by others. Instead, as noted above, the patent provides the right to exclude others from practicing the invention.

## What is the United States Patent and Trademark Office (USPTO)?

The USPTO is the federal agency, organized under the Department of Commerce, responsible for administering patents on behalf of the government. The USPTO employs patent examiners skilled in various technical fields in order to examine patent applications for various legal requirements.

## What types of patents are available in the United States?

A “utility patent” may be directed to useful processes, machines, compositions of matter, articles, computer programs, and methods (including methods of making compositions, methods of making articles, and even methods of doing business). A “plant patent” covers asexually reproduced varieties of new plants (other than a tuber propagated plant or a plant found in an uncultivated state). A “design patent” covers the visual ornamental characteristics embodied in an article of manufacture.

## What is a non-provisional patent application?

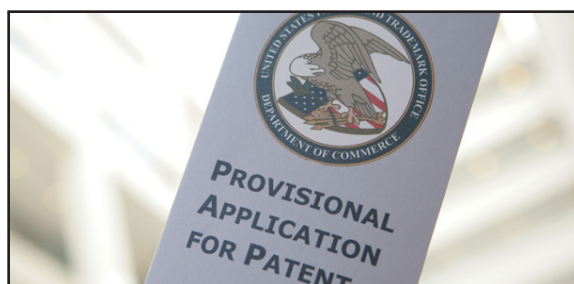
A non-provisional application is sometimes called a regular or full patent application. The patent application is a written document that is designed to describe the

invention in a suitable form to allow someone skilled in the same area of art to duplicate the invention. Preparing the patent application requires the inventor’s technical expertise as well as the patent attorney’s knowledge of the technical area and patent law.

The formal requirements of a non-provisional application include, among other things:

- 1) a description of the background of the invention
- 2) a brief description of the invention
- 3) a detailed (and enabling) description of the invention
- 4) drawings (when needed)
- 5) a brief description of the drawings (if any); and
- 6) claims

The claims are numbered paragraphs at the end of the patent application that define the invention in words. The claims are thus important in at least two respects. First, the claim should recite an element/step that is the point of novelty such that the claim is different from and non-obvious from the prior art. In addition, it is important that the claims be drafted broadly enough so that infringers may not make minor changes and design around the patent claims. More than one claim can be presented provided each of the claims is different. The claims can be presented in independent form (i.e. the claim stands by itself) or in dependent form, referring back to and further limiting another claim or claims in the same application.



## What is a provisional patent application?

A provisional patent application is a United States patent application that may be filed without some of the formalities required of a non-provisional patent application. A provisional patent application is not examined by the USPTO, and a patent cannot issue directly from a provisional application. At the university, a provisional



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Office of Technology Transfer and Economic Development  
900 Innovation Drive ■ Suite 145 ■ Rolla, MO 65401  
[ecodevo.mst.edu](http://ecodevo.mst.edu)



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patent application can provide a tool for preserving patent rights while temporarily reducing costs.

Importantly, a regular non-provisional U.S. application and related foreign applications must be filed within one year of the provisional filing in order to receive the provisional early filing date. However, an applicant only receives the benefit of the earlier filing date for material that is adequately described and enabled in the provisional application. As a result, the patent attorney often needs the assistance of the inventors when the first-filed application is a provisional application.

## What are the general standards for obtaining a patent?

In order to receive a patent, an invention must be novel (that is, it has never been done before), and non-obvious (that is, it would not have been obvious to modify or combine what is already known to arrive at the invention). The USPTO searches and reviews the prior art to assess novelty and non-obviousness. Non-obviousness can be a fairly subjective standard, and patent examiners can combine several references, each disclosing different features, to maintain that an invention is obvious in view of the prior art. If an invention is ultimately found to be either not novel or obvious, then a patent will not be granted for that invention. Thus, filing an application for a patent does not guarantee that a patent will be issued from that application.

## What is prior art?

The definition of prior art varies by country, but it may generally be thought of as anything that prior researchers in the field have made or disclosed in the past. Prior art may include printed publications, conference handouts, abstracts, books, newspaper articles, etc. Prior art may also include orally presented material, such as discussions at conferences, disclosures to competitors, certain disclosures to colleagues in a field, and other public statements.

An inventor may under certain circumstances create prior art (thereby jeopardizing patent rights) by publicly disclosing an invention prior to the filing of a patent application. Thus, if a researcher has publicly disclosed the invention to others prior to filing a U.S. patent application

directed to the invention, the researcher may be barred from obtaining a patent on the invention.

U.S. patent law generally allows twelve months from the occurrence of any such activity in which to file a utility application (six months for a design application). Many foreign countries do not allow any such activity prior to filing an application; thus, a researcher may be barred from obtaining patent protection in foreign countries if the invention was publicly disclosed prior to filing a patent application.

## Who should be listed as the inventor on a patent and who determines this?

The elements of invention under U.S. patent law include:

### *Conception of the Idea*

This involves complete performance of the mental part of the inventive act. All that remains is to convert the idea into reality by reducing it to practice. Both what is to be accomplished and how it is to be accomplished are necessary. Knowledge of a desirable result alone is not enough, nor is a means for an unknown result.

### *Reduction to Practice*

This involves creating either actual or constructive proof that the idea actually works or can exist. Purely actual reduction to practice is creating a physical embodiment of the idea, although complete perfection is not required. Purely constructive reduction to practice results when a patent application covering the completed concept is accepted by the patent office. The theory is that an acceptable filing is both conclusive proof of practicality and a sufficient disclosure of the concept in the application papers that one with ordinary skills in the arts involved would be able to practice the invention. Most often, sufficient reduction to practice is neither purely actual nor purely constructive.

Under U.S. law, an inventor is a person who takes part in the conception of the ideas in the patent claims of a patent application. Thus, an employer or person who only furnishes money to build or practice an invention is not an inventor. Inventorship is a legal issue and may require an intricate legal determination by the patent attorney prosecuting the application.



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Importantly, inventorship of a patent application may change as the patent claims are amended during prosecution of the application.

## What sort of records should be kept to help with the patenting process?

Laboratory notebooks may help overcome prior art and establish inventorship. To maintain good laboratory notebooks, a researcher should:

- Use permanent ink
- Use consecutive pages and date the entries
- Identify subject matter
- Include and explain sketches, diagrams, etc.
- Identify and attach photos, drawings, etc.
- Avoid erasures
- Make new entries and not alter existing entries
- Have entries witnessed on a daily or weekly basis
- Provide proper storage
- Identify the project to which all data relate
- Avoid fragmentary diagrams or sketches, or diagrams or sketches without explanatory notes
- Avoid loose pages or inserts carrying sketches or other information
- Avoid splitting entries between two or more laboratory books (one book should be complete in itself, especially when two or more investigators are working on the same project)
- Make notations of the progress and completion of compounds, assemblies, or models being prepared for testing
- Note the successful testing of a compound or particular setup or piece of equipment because reduction to practice and the date of such accomplishment may be important
- Never tear or cut pages from a laboratory notebook
- Keep laboratory notebooks in a safe place when not in use

## What occurs during the patent drafting and prosecution process?

### *Patent Drafting*

Patent applications are generally drafted by a patent attorney or a patent agent (a non-attorney with a science education licensed by the USPTO). The patent attorney will ask inventors to review an application before it is filed and will also ask questions about inventorship.

At the time an application is filed, the TTO will ask the inventors to sign an inventor's declaration and a confirmatory assignment of rights to the university.

### *Patent Prosecution*

Upon filing, the application is granted a filing date and a serial number. Once filed, the university (and the inventors) are allowed to use the designation "patent pending" with respect to the invention and associated advertising, packaging, etc. However, there are no enforceable rights unless and until a patent is actually issued from the application. Thus, while filing an application begins the process, the university cannot prevent others from making, using, selling, or offering for sale the invention unless and until a patent is actually issued.

Primarily because of the backlog of applications in the USPTO, it will typically be at least twenty-four to thirty-six months (and up to five years or more for software/Internet patent applications) before the application is reviewed by a patent examiner. After reviewing the application, a patent examiner will search the USPTO's prior art databases (issued patents, published applications, technical articles, etc.) to locate relevant prior art references. The examiner will also review the patent application for clarity and other legal issues. Typically, an examiner issues one or more office actions in which the application is rejected. The patent attorney, inventors, and TTO will collectively work on responses that attempt to address the examiner's reasons for rejection.

During this process, input from the inventor(s) is often needed to confirm the patent attorney's understanding of the technical aspects of the invention and/or the prior art



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cited against the application. If the examiner is persuaded, the patent application eventually issues. The time frame for pursuing a filing and prosecuting patent application to issuance is typically a minimum of two to five years.

## Who is responsible for patenting at the university?

The campus technology transfer office (TTO) may contract with patent attorneys at law firms for protection, thus assuring access to patent specialists in diverse technology areas.

Inventors work in conjunction with the TTO and the patent attorney in drafting the patent applications and responses to foreign patent offices.

## How is patent protection in foreign countries achieved?

Each country has its own patent laws, and a patent must be filed in each country in order to obtain patent protection in that country. However, under the Patent Cooperation Treaty (PCT), an inventor can file a single international patent application in one language with one patent office in order to preserve the right to seek patent protection for an invention in over one hundred countries throughout the world for up to thirty months.

Although the PCT system does not provide for the grant of an international patent, the university may file a PCT application because it:

- 1) delays the expenses associated with applying for patent protection in individual countries;
- 2) allows the TTO more time to assess the commercial viability of the invention; and
- 3) provides preliminary examination as to the patentability of the claims.

## How are the patent laws in foreign countries different from the United States?

Foreign patent protection is subject to the laws of each individual country, although in a general sense the process works much the same as it does in the United States.

In foreign countries, however, an inventor will lose any patent rights if the inventor publicly discloses the invention prior to filing the patent application. In contrast, the United States has a limited one-year grace period. If the invention has been disclosed publicly and this grace period could apply, contact the TTO as soon as possible.

## How long is a utility patent enforceable?

Once a utility patent is issued, it is enforceable for twenty years from the initial filing of the application that resulted in the patent. The USPTO requires payment of maintenance fees at four, eight, and twelve years from issuance.

## Why does the university protect only some intellectual property through patenting?

Patent protection is often a requirement of a potential commercialization partner (licensee) because it can protect the commercial partner's sizable investment required to bring the technology to market. Due to the expense and length of time required to obtain a patent, patent applications are not feasible for all university intellectual property. The TTO carefully reviews the patentability and commercial potential for an invention before investing in the patent process. However, because the need for commencing a patent filing usually precedes finding a licensee, the TTO looks for creative and cost-effective ways to seek early protections for as many promising inventions as possible.



## Who decides what gets protected in a patent?

The university and the inventor(s) consider relevant factors in making recommendations about filing patent applications. Based on a recommendation from the licensing specialist, the TTO director ultimately makes the final decision as to whether to file a patent application or seek another form of protection.



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## What does it cost to file for and obtain a patent?

Filing a regular U.S. patent application typically costs \$10,000 or more. Obtaining an issued patent typically requires an additional \$10,000 to \$15,000 for patent prosecution.

Filing and obtaining issued patents in other countries may cost \$20,000 or more per country. Also, once a patent is issued in the U.S. or in foreign countries, certain government maintenance fees are required to keep the patent enforceable. These fees may range from hundreds to thousands of dollars annually in each country.

## What happens if an inventor created the invention with someone from another institution or company?

After the inventor submits an invention disclosure form, the TTO will review the circumstances under which the invention was developed. If the invention resulted under a contract between the university and another entity, the TTO will review the contract to determine ownership and other rights associated with the contract and to determine the appropriate next steps. If the technology is jointly owned with another company, the TTO will work with the company to determine the appropriate patenting and licensing strategy.

If the technology is jointly owned with another academic institution, the licensing specialist will usually enter into an inter-institutional agreement that provides for one of the institutions to take the lead in protecting and licensing the invention, sharing the expenses associated with the patenting process, and allocating any licensing revenues.

## Will the university initiate or continue patenting activity without an identified licensee?

The university prefers to have a licensee in place before incurring the costs of patent prosecution but it is not always possible. Therefore, the university must often accept the risk of filing a patent application before a licensee has been identified. Once university rights have been licensed, the licensee generally pays the patenting expenses.

The TTO must at times decline further patent prosecution after a reasonable period (often a year or two) of attempting to identify a licensee or if it is determined that reasonable patent coverage cannot be obtained.

## Where can a researcher find examples of patents?

For copies of issued patents and published patents in the United States:

- a) The USPTO website  
<http://patft.uspto.gov/>
- b) Google Patents  
<https://www.google.com/?tbn=pts>

For the prosecution history and status of issued patents and published patent applications in the United States, visit the Patent Application Information Retrieval at  
<http://portal.uspto.gov/pair/PublicPair>

For copies of international patents, visit  
<http://patentscope.wipo.int/search/en/search.jsf>

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