



Center for Environmentally Beneficial Catalysis

Introduction to Intellectual Property and Patents

A Handbook for Researchers

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I. Intellectual Property

a. Introduction

Intellectual Property (IP) is a legal idea, analogous to the venerable law that governs what we think of as real or tangible property. The difference between IP and traditional property law is that the latter is easily ascertainable because it is described by physical boundaries that define the extent of the property held. In contrast, intellectual property is much harder to quantify because it is not so much a physical thing but an applied idea. This applied idea takes the form of the embodiment of an invention in a patent; published words of a copyright; or the familiar symbol of a trademark. As researchers at CEBC, you will be primarily concerned about protecting your work in a patent. However, a basic understanding of the other areas of IP will be useful to you in your academic career.

b. Constitutional Grant of Monopolies

Article I, section 8, clause 8 of the Constitution grants Congress broad power to protect authors and inventors by delegating to Congress the authority to grant exclusive rights over creations and inventions. Congress may not overreach its authority by enlarging the intellectual property monopoly without regard to the innovation, advancement, or social benefit gained. Thus the extent of the protection is dictated by the social value of the innovation.

c. Copyrights

Although your primary means of protecting your inventions will be patents, it is important to realize that there are other ways to protect intellectual property. The most significant in a University research context would be copyright protection. With this in mind, it may be useful to briefly review the tenants of copyright law.

Copyright protection subsists in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. Works of authorship include; literary works; musical works, including any accompanying words; dramatic works, including any accompanying music; pantomimes and choreographic works; pictorial, graphic, and sculptural works; motion pictures and other audiovisual works; sound recordings; and architectural works.

Copyright protection for an original work of authorship does not extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.

The owner of a copyright has the exclusive rights to copy or to authorize another to copy her works. However, the fair use of a copyrighted work, including for criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright.

II. Patent Law

a. Introduction

Patent law has developed in the United States over the past 215 years. The goal of the patent system is to benefit society by encouraging innovation and promoting public disclosure of technological advances. This disclosure of information is said to “enrich the public’s storehouse of knowledge.” The patent laws achieve this goal by offering inventors exclusive rights for a limited time period. In return they are required to disclose all the information needed to reproduce the invention.

b. Rights Conferred by a Patent

A patent confers the right to exclude any other person from using your invention for a limited amount of time. The period is twenty years from the time you file for a patent. This right held for this period of time is called the patent monopoly. Take note that a patent does not necessarily allow you to use the invention, it is a restrictive right, in that it allows you only to prevent others from using it. For example, you invent a cool new weapon; just because you have a patent does not mean you can go around discharging it. You are always subject to other laws that may limit your use even with a patent.

In today’s world patents may be important assets economically. Patents on machines, pharmaceuticals, chemical processes and many other inventions make the holders of the patents vast profits through licensing and assignment of patent rights to others. The ability to patent a new invention is the primary motivation behind most research and development.

c. Patent Subject Matter

A patent may be granted for an invention or discovery that is a new and useful process, machine, matter of composition, or any new and useful improvement of any of the items mentioned above.

Perhaps the deepest rooted misconception about patents pertains to "the patentability of ideas." Thus, not infrequently, a certain idea will be spoken of as being "patentable," another idea, as being "unpatentable." Even the Supreme Court, on occasion, has spoken in these terms. Ideas nurture the patent system; they are its pabulum. Strictly speaking, however, naked *ideas are not patentable*. In order to be patentable the idea must be reduced to practice. This does not mean that the person seeking the patent has to have an actual example of the invention; it simply means that the patent application contains enough information to allow a person with ordinary skill in the area to follow the specifications to get the specific product, the invention.

d. Requirements for Patentability

In order to receive a patent a party must file a patent application with the Patent and Trademark Office (USPTO). The Patent and Trademark Office reviews each patent application to see if it meets five requirements: an invention fits one of the three general categories of patentable subject matter mentioned above; it has not been preceded in identical form in the public prior art; it is useful; it represents a nontrivial extension of what was known; and it is disclosed and described by the applicant in such a way as to enable others to make and use the invention. 35 U.S.C. §§101 (utility), 102 (novelty), 103 (nonobviousness), and 112 (enablement).

1. Novelty

Patent lawyers call the no-identical-prior-invention requirement "novelty." In practice, novelty is established by applying a set of technical rules to determine if a patent applicant was really the first to make the invention she is claiming. The novelty test determines whether the claimed invention is unpatentable because it was made before, sold more than a year before a patent application was filed, or otherwise disqualified by prior use or knowledge. This preexisting information is referred to as "prior art," and is discussed in more detail below.

2. Utility

Utility, the second requirement, has devolved over the years into a rather minimal obstacle to obtaining a patent. Section 101 is the source of this requirement. 35 U.S.C., §101 ("Whoever invents any new *and useful process*, machine, manufacture, or composition of matter, may obtain a patent therefor. . . ." (emphasis added)). Today, a patent will not be withheld even though the invention works only in an experimental setting and has no proven use in the field or factory. Only if an invention has absolutely no "practical utility" will a patent be denied. The only exception is inventions pertaining to pharmaceuticals, where some cases question whether laboratory promise is enough to establish utility in treating human patients.

3. Nonobviousness

The next requirement, nontriviality, is known to patent lawyers as "nonobviousness." 35 U.S.C §103. This is the most important requirement; it has been called "the ultimate condition of patentability." The reason is that nonobviousness attempts to measure an even more abstract quality than novelty or utility: the *technical accomplishment* reflected in an invention. This requirement asks whether an invention is a big enough technical advance over the prior art. Even if an invention is new and useful, it will still not merit a patent if it represents merely a trivial step forward in the art. The key question asked is: could someone with a normal level of skill in this area of science put the invention together simply by piecing together information that is already in the public domain? If any scientist with a normal level of skill would have been able to put the pieces together without any original thought this requirement is not met.

4. Enablement

Finally, 35 U.S.C. §112 requires a patentee to give a sufficiently good description of her invention so that "one of ordinary skill in the art" would be able to make and use the invention. The concern here is not so much with whether the inventor has developed something worth patenting as it is with the benefit the public obtains from the patent "bargain." The disclosure and "enablement" requirements of section 112 ensure that those "skilled in the art" of the invention can read and understand the inventor's contribution, and that after the patent expires they will be able to make and use the invention themselves.

e. Anatomy of a patent

A patent in its completed form has two main sections. First, the specification is the written instructions to make your invention or complete your process. The specification is a description that will enable others to make your invention using the information you supply. Finally, the claims state what your invention is used for.

The claims section is very significant because it defines the scope of the rights you hold in your patent. A good patent attorney will try to make the claims of your invention as broad as possible. For example, if you were trying to patent a machine that rockets you to the moon you would like to claim "a machine that rockets any person to the moon" however, there are certainly other machines already invented that "rocket any person to the moon" so you would have to narrow your claim to "a machine that rockets any person to the moon using any type of springing

device.” In contrast, you do not want too be to narrow in your claims either. For example, if you claimed “a machine the rockets any person to the moon using rubber bands” devices that use a steel spring are not protected by your patent.

f. Pre-Patent Prosecution Overview

Now that we have a general idea of what a patent is, it may be useful to delineate how we get to the point we are ready to file a patent. First, you come up with an idea, and then you begin to reduce the idea to practice. During the process you should be keeping records of your progress in a notebook and begin filing out the invention disclosures. Once you have finished reducing the invention to practice you send the final invention disclosure to your University technology transfer office (UTTO).

After a university technology transfer office receives an invention disclosure, assistance from in-house or outside patent counsel is often sought to help determine whether a particular disclosure merits patent protection. In addition to determining whether the statutory requirements of usefulness, novelty, and nonobviousness have been met, a patentability assessment may include searches of the state of existing art and patents in the field to help determine the strength of possible claims for a patent application. This search also may help assess the ability for third parties to engineer around the possible claims of an invention and may assist in determining the difficulty in detecting infringement and withstanding litigation.

As mentioned above even if you receive a patent this does not necessarily allow you to use the invention. Along with making sure that your invention is patentable is a process known as a freedom to operate assessment. Usually done by a patent attorney, the assessment is an exhaustive determination of whether you will be able to use the patent after you receive it without infringing another’s patent. A more cursory assessment done by the inventor(s), or his agent, is recommended to prevent wasting time and resources on trying to patent an invention that may have little or no value since you will be unable to use or market

Of particular concern to practitioners is the United States statutory patent requirement that an invention not be "described in a printed publication ... more than one year prior to the date of the application."

Further, most foreign patent regimes do not allow any publication of an invention prior to the filing of a patent application without jeopardizing patent protection. After the attorney has made the determination that the invention is patentable he will draft and submit a patent application to the United States Patent and Trademark Office (USPTO) for consideration. The process of consideration is called the prosecution of the patent. Prosecution of a patent is usually a costly and complicated process with communication back and forth between the person seeking the patent and the USPTO. Patent examiners in Washington D.C. review each patent closely to make sure it meets all the requirements mentioned above (Utility etc.). These examiners are experts in a particular area of patents and are divided into departments that focus on different types of inventions.

III. Prior Art

a. Introduction

In conjunction with deciding whether the application meets all the requirements of novelty, utility and nonobviousness, the Patent and Trademark Office ("USPTO") analyzes patentability of an invention by looking at the "prior art." Prior art is a term used in patent law that essentially means that the information in your patent application is already part of the information that exists in the public domain (*i.e.* “storehouse of knowledge”).

When you are trying to prove that you have a new idea that you should have exclusive rights to, that fact that it is already public knowledge invalidates your claim. Prior art has traditionally included only public information, such as existing patents, patent applications, and journal articles. However, the Federal Circuit recently concluded that information disclosed to an inventor during private communications in a collaborative environment is considered prior art for the purpose of an obviousness determination. The Patent Act, in section 103(c), prevents this type of communication from rendering a patent obvious if the collaborative effort occurs in one corporate entity. However, there is no protection if two inventors in the collaboration are from separate industries.

If you have an invention that you think is patentable you will want to do a search of areas where there may be prior art. This prevents wasting time trying to patent something that has already been invented, and allows you and your University to focus on more promising areas of research.

b. Searching for Prior Art - Patents and the USPTO

The first place to look for prior art is in preexisting patents. The USPTO has all recent patents and patent applications available to be searched electronically on the USPTO website. The USPTO website is <http://www.uspto.gov/>. The database is very advanced and enables a person to do a very effective search of the material if they understand how to use the database. Because the database is so advanced it is important to know how to use the database so as to insure a thorough search. Introductory materials on how to search the USPTO database is contained in the appendix. When an examiner receives a patent application the first thing she does is compare the application to all previously filed patent applications. Thus, it is important to be sure that the invention you are trying to receive a patent for has not previously been disclosed in another patent application.

c. Searching for Prior Art – Publications

The next step is to review publications that may contain a disclosure of an invention that would be the same as the one you are trying to patent. If there is such a disclosure, your invention will not be patentable, because the previously published invention is prior art to your invention. As you conduct this search it may be helpful to identify publications that would most likely deal with the nature of your invention. This would include scholarly journals, conference proceedings, similar lab websites, etc. Most research institutions will have access to advanced scientific search engines such as SciFinder. SciFinder, is a research tool that allows you to access a vast collection of biochemical, chemical, chemical engineering, medical, and other related information. Using such a database will allow you to access potential prior art faster than looking up each applicable publication separately. Be thorough, because failure to identify prior art may result in your efforts being wasted on an unpatentable project or invention.

To be a printed publication, the means of printing used should be susceptible of wide dissemination and the document must, among other things, be distributed, disseminated, or otherwise made accessible to the public. This includes electronic sources such as digital dissertations and electronic journals. The public may be either the public as a whole or the portion of the general public that is interested in the document's subject matter and thus most likely to avail themselves of its contents.

Conference papers distributed at public meetings of persons skilled in the art are prior art as printed publications. On the other hand, presentations made before a limited audience, and which do not reveal the entire invention, are generally not considered sufficiently disseminated to the public. Likewise, mailing brochures on a patented product to a person who might secure financing is inadequate dissemination to show publication of the invention before the critical date (the date you file your application).

Dissemination of information to a party who has some legitimate association with, or ownership interest in, the invention is termed a proprietary disclosure. Dissemination to a party with no such association or ownership is termed a non-proprietary disclosure. Generally, proprietary disclosures are not considered prior art, while non-proprietary disclosures are. The line between the two categories is not at all clear legally. Therefore, before a researcher disseminates information to a party not normally a part of the information exchange she must consult with the institution's IP legal counsel.

IV. Other procedural Considerations

a. In House Publication Concerns

There are two cases where your actions may create prior art for the invention you are trying to get a patent for. First, if you disseminate the details of your invention before filing for a patent that disseminated information is considered prior art. In the United States, if you do not file for a patent within a year of the date of dissemination you will not be able to get a patent. In foreign countries there is no one year grace period, so by disseminating the information you will lose the opportunity to get a patent outside the United States.

Lastly, if your invention is used in public even if by limited parties the exposure is considered prior art. Again, there is a year to patent in the U.S. and a loss of patentability outside the U.S. There is a narrow exception allowed if the public exposure is to test the effectiveness of the invention, but this is only in cases where, in order to see if the invention works, you must take it out in public.

In an academic setting there may be pressure to publish, as stated above this may cause problems if the published data is the subsequent subject a patent application. Thus in a University setting there is tension between the free exchange of information that is part of academia, and non-disclosure, a requirement of patentability.

b. Provisional Patents

One possible remedy in easing the tension between the push to publish and the need for nondisclosure is to file for a “provisional” patent. A provisional patent is granted for only a year and without the exhaustive prosecution that accompanies a regular patent. The advantage to the provisional patent is that you can more easily and quickly file and receive it, thus speeding up the time when you are allowed to publish. Another advantage is that if you choose to pursue the full fledged patent you have priority over other parties as of the date you filed the provisional patent. If you file a normal utility patent the date by which your twenty years of protection begin running is the date you file the utility patent not the provisional patent. Thus you can get up to twenty one years of protection if you choose this approach.

There are disadvantages to this approach. These include the possibility that the full patent may not be as extensive in its protection as you hoped when you filed the provisional patent. A defective provisional patent may bar using the date of the filing of the provisional patent as the date to which the full utility patent relates back to. Unlike a full utility patent a provisional patent is not examined, thus if there are defects it is up to the individual to identify them before the provisional patent is filed. Although not examined, and not required to have claims, a provisional patent must be the complete story of the invention (i.e. the specification and drawing must be enabling and represent the best mode to making the invention etc.). Thus, provisional patents must be carefully crafted just as a utility patent so that it is not found to be defective. One huge risk is that of publishing first, then instead of filing a full utility patent within a year of the publication, you file a provisional patent, subsequently; the provisional patent is found defective, and the year from the time of publishing runs out before you can submit a full patent application. This has the same effect as waiting more than a year after publication to file a patent application, and you are barred by law, because your publication is now considered prior art.

c. International Patents

Although laws between countries vary considerably for the most part, international patent law is the exception. Due to international treaties and the benefits to all countries to have there inventions protected worldwide, patent law is very uniform throughout most industrialized countries. Recently the U.S. has taken steps to configure its law to be more in line with law in the majority of countries.

Two significant differences still exist. First, as mentioned above, there is a year grace period after an invention is published in the U.S. which is not the case internationally. Lastly, the U.S. uses a “first to conceive” system where the rest of the world uses a “first to file system”

d. First to file system

Presently (the end of 2005) there is legislation being considered in congress that would change the present system for gaining patent rights above another party in regards to a specific invention. Currently, the law is that the first party to conceive of the invention will be granted the patent (this assumes that they comply with all patenting requirements and that there is no undue delay in filing the patent application). In this system you may not be the first party to file for a patent on an invention, but if you conceived it first (i.e. had all the details figured out) you still win.

In contrast, the new provisions would do away with the “first to conceive” system and instead go with a “first to file” system. This new system would not concern itself with who came up with the idea first, but instead focus on who was the first to reduce to practice and then patent

the invention. This “first to file” approach is the system of most other countries, and the change represents an effort for the U.S. to be more uniform with the rest of the international community.

V. CEBC’s approach to IP

a. Overview

The road your research takes to become a patented invention begins with the completion of an invention disclosure. If the invention in the invention disclosure is deemed to be significant and patentable by the faculty it is then sent to the UTTO for their evaluation. Simultaneously, a copy is sent to CEBC so that they can present the invention to the Industrial Advisory Board (IAB) for their input into the commercial value of the invention. If the IAB analysis as to commercial value and the UTTO review as to patentability are positive, the decision is made to pursue a patent by filing a patent application with the USPTO. In the interim negotiations with IAB members may result in licensing, exclusively or non-exclusively, of the invention to an IAB member.

b. Rights and Responsibilities Involving Intellectual Property

Each University is responsible to set forth an IP rights and royalties policy. And the details may vary from one institution to the next. Each school will end up with a different policy based on different factors. For example one institution may be more generous with the portion of the proceeds than another. Each school is an independent entity and as such sets the parameters of their policy. CEBC does not have its own IP profits policy, but defers those questions to the pre-existing policy of the specific University in question. This is because the schools, not CEBC, own the patent rights. Another difference among the Universities is who is eligible to participate in the royalties of a patent. Professors as well as students may participate depending on the policies of the various Universities.

Legally, your ability to obtain patent rights may also depend on whether you were an inventor and have inventorship. To constitute joint or co-inventorship only those persons who participated in the conception of the invention are deemed joint or co-inventors. Persons who merely carry out the actual reduction to practice are not deemed part of the inventorship entity.

c. Invention Disclosures

An invention disclosure is a document which provides information about the inventor(s), what was invented, circumstances leading to the invention, and facts concerning subsequent activities. It provides the basis for a determination of patentability and the technical information for drafting a patent application. An invention disclosure is also used to report technology that may not be patented but is protected by other means such as copyrights.

Inventors must prepare and submit on a timely basis an invention disclosure for each potentially patentable invention conceived or first actually reduced to practice in whole or in part in the course of their University responsibilities or with more than incidental use of University resources. This requirement of submission is per NSF expectations and the CEBC industry membership agreement.

Researchers should fill out invention disclosure forms at an early meaningful stage of the development of the invention and supplement frequently as improvements are made during the development of the idea/invention. A disclosure form describing the invention and including other related facts should be prepared by the inventor and forwarded to your UTTO, and to the

CEBC Inventions Administrator, as appropriate. Forms may be requested from the specific UTTO.

Individuals covered by this policy are expected to apply reasonable judgment as to whether an invention has potential for commercial marketing. If such commercial potential exists, the invention should be considered “potentially patentable,” and disclosed to the UTTO and CEBC.

d. CDA (Confidentiality agreements)

Confidentiality agreements, sometimes called secrecy or nondisclosure agreements, are contracts entered into by two or more parties with the main purpose of keeping information confidential. Such agreements are often used when a institution or individual has a secret process or a new product that it wants another individual or institution to evaluate as a precursor to a comprehensive licensing agreement. Or, perhaps one party wants to evaluate another's existing commercial product for a new and different application.

Confidentiality agreements perform several functions. First and most obviously, they protect sensitive technical or commercial information from disclosure to others. One or more participants in the agreement may promise to not disclose technical information received from the other party. If the information is revealed to another party not included in the agreement, the injured party has cause to claim a breach of contract and can seek injunctive and monetary damages.

Second, the use of confidentiality agreements can prevent the forfeiture of valuable patent rights. Under U.S. law and in other countries as well, the public disclosure of an invention can be deemed as a forfeiture of patent rights in that invention. A properly drafted confidentiality agreement can avoid the undesired—and often unintentional—forfeiture of valuable patent rights. If there is a specific reason to share information with an outside party the CEBC requires that there be a confidentiality agreement so as to ensure that the exchange of information does not inhibit the ability to receive a patent

Third, confidentiality agreements define exactly what information can and cannot be disclosed. This is usually accomplished by specifically classifying the nondisclosable information as confidential or proprietary.

The type of information that can be included under the umbrella of confidential information is virtually unlimited. Any information that flows between the parties can be considered confidential—data, know-how, prototypes, engineering drawings, computer software, test results, tools, systems, and specifications. This list is certainly not exhaustive but does illustrate the breadth of items that can be deemed confidential.

Most confidentiality agreements exclude certain types of information from the definition of confidential information. It is very important that the parties include these exceptions in the confidentiality agreement. Some commonly employed exceptions are information that the recipient can demonstrate that they had prior to receipt of information from the other party, information that becomes known to the public through no fault of the recipient, information that becomes known to the recipient from a third party that has a lawful right to disclose the

information, information that was public knowledge before the disclosure of the information to the recipient, and information independently created by party.

Each University has its own standard confidentiality agreement, that would cover the considerations mentioned above. Although the format among the agreements may vary the effect of the document should be the same.

e. Note Keeping

There are three legal reasons why a researcher should be diligent in keeping records. First, to show the point at which the invention was conceived. Next, to detail the process used to reduce the invention to practice. Lastly, to show the researcher was diligent in pursuing the invention to the point it is reduced to practice.

Research record keeping has traditionally been carried out by recording developments in a laboratory notebook. This is particularly important for conception, where the idea that formed the basis of an invention was purely mental. That idea should be recorded in a notebook or other document, signed and dated by the inventor and also signed and dated by a witness who is not a co-inventor. Witnessing is particularly important to prove conception, because there usually will be no physical manifestation of conception that can serve as evidence. The witness should have a technical background that is sufficient to enable him to appreciate the significance of what is being recorded. The witness will be expected to know more about the invention than what is written in the notebook or was described orally by the inventor. An excellent witness may be a fellow researcher or a supervisor, as long as that individual will not be named as a co-inventor.

As mentioned above a person who merely carries out the experiments is not considered a co-inventor and can be a witness. However, a person who plays a role in the conception of the idea is considered a co-inventor and should not be used as a witness. The rule of thumb should be if you are just performing the experiments per the instructions of another person you can act as a witness. However, if you are giving input into the direction of the experiment you are a co-inventor and should not sign as a witness.

Not every notebook entry has to be witnessed, although every one should be dated. Entries describing ideas which are felt to be original to the inventor definitely should be witnessed. More generalized entries not related to the conception of an original idea do not have to be witnessed. Similarly, notebook entries related to the work of another, and serving potentially to support originality by the other worker, do not have to be witnessed. It is the inventor's notebook entries supporting his own work that must be witnessed. Of course, there is no harm in having everything witnessed.

Documentation showing conception should be as thorough as possible, as proof of conception requires a showing that all elements of a claimed invention were conceived by the purported date of conception. A conception date is not awarded if the notes indicate that the researcher had not fully conceived the invention, and that there were critical adjustments still to be made, or unanswered questions still to be addressed. As noted the motivation to keep records to show conception may not be a factor in the future if the present "first to conceive" system is replaced with a "first to file" system.

Documentation showing reduction to practice should also be recorded in a notebook.

Preferably, information about the reduction to practice will be found both in the inventor's notebook and the witness' notebook. The witness should be ready to testify that he either watched the inventor carry out all the important aspects of the invention or that he carried out the invention himself on behalf of the inventor. The notebook entries will serve to support this testimony. If necessary, the invention must be tested to show that it will do what it is supposed to do. If the inventor makes a demonstration of the invention without a witness, he should repeat the demonstration in the view of a witness. The witness for a reduction to practice may be the same witness as for conception. If the witness carried out the reduction to practice on behalf of the inventor and made an entry in his own notebook, the inventor's notebook should record that fact.

The best type of notebook is of the numbered, bound type to be maintained as a permanent record. The notebook entries should be running, consecutive, dated accounts of work conducted on projects. Each page should be limited to a single subject and a single day's work. The exact chemicals and their sources used in the experiments should also be noted. Other records to be included as documentation are plans, test sheets, material orders and time records; anything that can be used to supplement the notebook record is helpful.

Each project should be documented on a periodic basis to show what was done, why the work was done, and when and by whom the work was done. The record should also indicate what the results and conclusions were. The notebook entries should be thorough; to prove conception, the disclosure must be detailed enough to enable another researcher in the same area of expertise to understand what was in the inventor's mind. To help prove reduction to practice, enough detail must be provided to show exactly what was done to demonstrate completion of the invention.

The written records must be clear; the objective of the research should be noted; they should not be obscured in any fashion to prevent discovery by others. This might reduce the chances of proving complete conception or reduction to practice. Even worse, several years down the road it may be impossible to reconstruct exactly what the inventor had in mind.

Notebook entries should be made as frequently as possible, if not daily. It is important for notebook entries to have the appearance of the original documentation that they represent. Information in the notebook does not have to be neatly presented, as authentic documentation will tend to be rather disorganized. Any unusual delay in time between entries might show a lack of diligence which can reduce the value of the documentation or even suggest that critical documentation has been withheld.

The inventor should never falsify the record. Actual facts and dates should be recorded. Erasures should not be made; pages should not be torn out. Mistakes should be corrected by drawing a line through the incorrect words or portions of the page so that the content of the mistake remains readable, and the correct language supplied. Records should never be altered at a later date. Large spaces on pages should not be left open. A page or portion of a page that is left blank should be covered with a diagonal line to prevent an inference that the inventor filled in pages after the signature date.

It is helpful to show the type of reasoning and experience that led to the invention. If the inventor has attended conferences or read articles to stimulate a particular approach, that should be indicated in the notebook. If mistakes were made or the approach to conception or reduction to practice changed, the notebook record should indicate that, since this information will help support the integrity of the documentation.

The inventor should not be afraid to admit an error in the notebook; mistakes are just as important as successes in the evolution of an invention. Mistakes in a notebook also suggest that the entries are authentic and not contrived by the inventor after the fact. Ink or indelible pencil should be used in the notebook to reduce any suspicion that the inventor may have altered the notebook at a later date.

Ideally, the inventor's notebook should, from time to time, be reviewed both by the inventor and co-workers, a supervisor, and possibly even by a member of the patent department, for the purpose of identifying patentable subject matter. Frequently, the inventor has developed a number of small improvements which themselves are not patentable but, when joined with improvements by others, can result in an outstanding invention. Furthermore, the inventor sometimes considers an improvement to be obvious, whereas scrutiny by others may identify patentable subject matter.

Witnesses to conception, reduction to practice and diligence should be identified in the inventor's notebook, even if the witnesses do not sign the notebook. This will make it possible to locate witnesses later if testimony evidence corroborating an early date of invention becomes necessary.

A question arises as to whether computer records obtained from a network data base through a work station or other computer-based source will be found acceptable as evidence of prior invention. The Federal Rules of Evidence, to which interference proceedings must conform, often admits printouts of computer data as records acceptable as evidence. However, whether computer-generated records will generally be found to represent persuasive evidence of conception, diligence or reduction to practice has not yet been determined. The problem is that computer records are not inherently reliable, and, until printed and witnessed, the records are not corroborated. Because uncorroborated computer records are subject to being altered, it is likely that evidence of invention based only upon data stored in a computer memory will be found insufficient. The authors of this handbook are not aware of PTO or court cases that have addressed the issue.

Hence, to be safe, computer records on or related to subject matter that is likely to have originality and commercial value to the company should be printed out as soon as possible after development, signed and dated by the inventor, and corroborated by a witness. The printout should be bound by using tape, glue or other means and archived. Ordinary data base records which have no specific relevance to invention do not have to be printed.

VI. Glossary

Art. *Intellectual Property.* In IP the term art refers to the area of science. Why not just say area of science instead of area of art? Because the power to grant patents was given in the constitution and at that time science as we know it presently was termed the “arts.”

Best mode. *Patents.* The best way that the inventor knows to work the invention described and claimed in a patent or patent application. • A patent application must disclose the best mode known to the inventor at the time of the filing. Failure to disclose the best mode can render a patent invalid

Challenge to validity. A legal proceeding where a party challenges the validity of a patent held by another party. The aim of the challenge is to show that the patent should not have been granted initially or that due to events (usually misconduct) after the patent was issued, it should be declared invalid. If a patent is found to be invalid other parties will be able to use the invention without getting permission from the former patent holder.

Claim. *Patents.* A formal statement describing the novel features of an invention and defining the scope of the patent's protection.

Conception of invention. The formation in the inventor's mind of a definite and permanent idea of a complete invention that is thereafter applied in practice. • Courts usu. consider conception when determining priority of invention.

Continuation-in-part. *Patents.* A patent application filed during the pendency of an earlier application by the same applicant, repeating a substantial part of the earlier application but adding to or subtracting from the claims. [35 USCA § 120](#). • This type of application contains new technical descriptions from the inventor or reflects improvements made since the parent application was filed. A claim in a continuation-in-part application is entitled to the benefit of the parent application's filing date if the claimed subject matter is the same, but new matter takes the filing date of the continuation-in-part application. Continuation-in-part applications are usu. filed to describe and claim later-discovered improvements to an invention, or to distinguish the invention from some prior-art reference. -- Abbr. CIP. -- Also termed *continuation-in-part application*; *continuation application*; *continuing application*; *file-wrapper continuation application*.

Divisional application. A patent application based on the same disclosure as the original application but claiming a different invention. • If an examiner finds that a disclosure reveals two or more distinct inventions, the applicant must restrict the original application to claiming one of the inventions. A divisional application can then be filed on any nonelected invention, and it will keep the same filing date as the parent application. -- Often shortened to *divisional*. -- Also termed *restriction application*.

Enablement. *Patents.* The disclosure in a patent application; specif., the description of the subject matter clear and complete enough to teach a person with ordinary skill in the art how to make and use the invention. • If the artisan would still be unable to work the invention without undue experimentation after reading the description -- in light of the information known in the art as of the filing date of the patent application -- the patent application will be rejected for lack of enablement.

Interference. *Patents.* An administrative proceeding in the U.S. Patent and Trademark Office to determine who is entitled to the patent when two or more applicants claim the same invention, or when an application interferes with an existing patent. • This proceeding occurs when the same invention is claimed (1) in two pending applications, or (2) in one pending application and a

patent issued within a year of the pending application's filing date. -- Also termed *priority contest*.

Maintenance Fees. *Patents.* maintenance fees are due three years and six months, seven years and six months, and eleven years and six months after the date of a U.S. patent grant, or within a grace period of six months thereafter upon payment of a surcharge as provided by law. The amount, number, and timing of the maintenance fees required may be changed by law or regulation. Unless payment of the applicable maintenance fees required may be changed by law or regulation. Unless payment of the applicable maintenance fee is received in the Patent and Trademark Office on or before the date the fee is due or within a grace period of six months thereafter, the patent will expire as of the end of such grace period.

Nonobviousness. 1. An invention's quality of being sufficiently different from the prior art that, at the time the invention was made, it would not have been obvious to a person having ordinary skill in the art relevant to the invention. **2.** The requirement that this quality must be demonstrated for an invention to be patentable. • Nonobviousness may be demonstrated with evidence concerning prior art or with other objective evidence, such as commercial success or professional approval. The test of obviousness involves examining the scope and content of the prior art, the differences between the prior art and the patent claims, and the level of ordinary skill in the art.

Novelty. Newness of an invention both in form and in function or performance; the strict statutory requirement that this originality be demonstrated before an invention is patentable. • Proving novelty is one purpose of the rigorous and expensive examination process. If the invention has been previously patented, described in a publication, known or used by others, or sold, it is not novel.

Patent. The governmental grant of a right, privilege, or authority. **2.** The official document so granting. -- Also termed *public grant*.

business-method patent. A U.S. patent that describes and claims a series of process steps that, as a whole, constitutes a method of doing business. • Until 1998, methods for doing business were not expressly recognized as being patentable.

combination patent. A patent granted for an invention that unites existing components in a novel way.

design patent. A patent granted for a new, original, and ornamental design for an article of manufacture; a patent that protects a product's appearance or nonfunctional aspects. • Design patents -- which, unlike utility patents, have a term of only 14 years from the date on which the patent is granted -- are similar to copyrights.

improvement patent. A patent having claims directed to an improvement on a preexisting invention. • If the preexisting invention is patented by another, the owner of the improvement patent may need a license to practice the invention covered by the claims of the improvement patent. Similarly, the owner of the preexisting invention's patent may need a license to practice the invention in the improvement patent.

method patent. A patent having method or process claims that define a series of actions leading to a tangible physical result. -- Also termed *process patent*. See *process patent*.

paper patent. A patent granted for a discovery or invention that has never been used commercially. • A paper patent may receive less protection under the law than a patent granted for a device that is actually used in industry. As a prior-art reference, a paper patent may carry less weight with examiners than one for an invention that has been

commercially exploited because it may suggest that the invention did not work as claimed.

plant patent. A patent granted for the invention or discovery of a new and distinct variety of asexually reproducing plant.

process patent. A patent for a method of treating specified materials to produce a certain result; a patent outlining a means of producing a physical result independently of the producing mechanism. • The result might be brought about by chemical action, by applying some element or power of nature, by mixing certain substances together, or by heating a substance to a certain temperature. See *method patent*.

utility patent. A patent granted for one of the following types of inventions: a process, a machine, a manufacture, or a composition of matter (such as a new chemical). • Utility patents are the most commonly issued patents.

Prior art. *Patents.* Knowledge that is publicly known, used by others, or available on the date of invention to a person of ordinary skill in an art, including what would be obvious from that knowledge. • Prior art includes (1) information in applications for previously patented inventions; (2) information that was published more than one year before a patent application is filed; and (3) information in other patent applications and inventor's certificates filed more than a year before the application is filed. The U.S. Patent and Trademark Office and courts analyze prior art before deciding the patentability of a comparable invention.

Prosecution. *Patents.* The process of applying for a patent through the U.S. Patent and Trademark Office and negotiating with the patent examiner. -- Also termed *patent-prosecution process*.

Provisional Patent. An application that can be filed up to a year before the patent application itself, in order to establish a date for prior art and constructive reduction to practice. • The provisional patent must include a full description of the invention, but claims, drawings, and prior-art disclosures are not required.

Reduction to practice. *Patents.* The embodiment of the concept of an invention, either by physical construction and operation or by filing a patent application with a disclosure adequate to teach a person reasonably skilled in the art how to make and work the invention without undue experimentation. • The date of reduction to practice is critical in determining priority between inventors competing for a patent on the same invention.

actual reduction to practice. The empirical demonstration that an invention performs its intended purpose and is therefore complete for patent purposes; the use of an idea or invention -- as by testing it -- to establish that the idea or invention will perform its intended purpose.

constructive reduction to practice. The documented demonstration that an invention will perform its intended purpose, contained in a patent application that provides enough detail that a person skilled in the art could make and test the invention; the filing of a patent application for an invention or design.

vicarious reduction to practice. A doctrine that treats one party's actual reduction to practice of an invention as the opposing (usu. complaining) party's actual reduction to practice. • In a two-party interference, proof of derivation is usu. sufficient; showing an actual reduction to practice is unnecessary. The doctrine is more important in a three-party interference.

Specification. *Patents.* The part of a patent application describing how an invention is made and used, the best mode of operation of the claimed invention, and the inventor's claims. • The

specification must be clear and complete enough to enable a person of ordinary skill in the art to make and use the invention. It must also disclose the best mode of working the invention. The term may also refer to the description as separate from the claims

Utility. *Patents.* Capacity to perform a function or attain a result claimed for protection as intellectual property. • In patent law, utility is one of the three basic requirements of patentability, the others being nonobviousness and novelty.

VII. Appendix

Guide to searching the USPTO patent database for prior art

Step 1: Conduct a keyword search in the [U.S. Patent databases](#): Issued Patents and Patent Applications.

Quick Search: The Quick Search provides 2 search boxes where you may type one word or a phrase. To input a phrase you must enclose your words in double quotation marks, ie: "digital signal processor" To allow for varying endings for a word you can truncate only one word searches. The truncation symbol used is the **dollar sign, \$**. For example a search of **magnet\$** would retrieve magnet, magnets, magnetic, magnetism, etc. You cannot truncate phrases that are placed inside quotation marks. This is a major limitation when using the Quick Search. You cannot do a combination of 2 words in one search box, ie: polymer or plastic. You must do this more advanced search in the [Advanced Search screen](#).

There are many **Fields to Search** by using the pull down boxes on the right. A field is a part of the patent that has been indexed and made searchable. The fields are: Title; Abstract (summary of the patent); Claims (statement of the scope of the invention); Description/Specification of the patent; Issue or other Dates; Patent Number or Application Serial Number; Inventor Name, City, State or Country; Assignee (Company) Name, City, State or Country; U.S. or International Classification Systems; Patent Examiner; etc. It is very important to choose the correct field for your search. If you are starting a prior art search and do not want very large numbers of patents to look through, it may be practical to search the Abstract field. If you want more comprehensive results, searching a larger portion of the patent may be desired. You should then choose to search All Fields, Description/Specification, or Claims.

When using the Quick Search you also have the option to use And, Or, AndNot to link the two search boxes. Also choose the dates that are relevant for your search. Be sure to review the [Help](#) provided by the USPTO. Remember when searching by any field except the U.S. Classification numbers or the Patent Number you are only searching 1976 to the present. To search for older patents we will provide tricks throughout this tutorial. If you are searching for very recent information or want to be comprehensive in your search you also need to check for [Patent Applications](#). Applications have been published since March 2001 and are searchable in a separate database. Note: an inventor may request that their application not be published, therefore this is not a comprehensive database of all pending applications.

Here is an example of a search using the [Quick Search](#). U.S. PTO Full-Text and Image Database.

Quick Search Screen: USPTO Patent Full-Text and Image Database:

Query [\[Help\]](#)

Term 1: in Field 1:

Term 2: in Field 2:

Select years [\[Help\]](#)

The result of a search provides a list of titles and patent numbers that match your search request. Review the titles and click on titles that you would like to see more information about. You also have the choice to modify your search.

Results list from the Quick Search, USPTO Patent Full-Text and Image Database:

Refine Search	
ABST/"aramid fibers" AND ABST/fire	
PAT. NO.	Title
1 6,489,256	Fire escape blanket and other melamine resin containing compositions and products with fire blocking properties
2 6,383,623	High performance insulations
3 5,167,876	Flame resistant ballistic composite
4 4,780,359	Fire retardent structural textile panel
5 4,743,495	Seat cushion fire blocking fabric

When you click on an interesting title you will retrieve the full-text of the patent. Listed first will be the patent number and date granted and the inventor's name. Next will be the title and abstract. Next will be information concerning the company that has purchased the rights to the patent - Assignee.

Listed next will be the **Current U.S. Class**. This will be usually 3 - 15 classification numbers (class number/subclassnumber) that have been assigned to this patent. If this patent proves to be relevant than this is very helpful information because now you have starting points to look at when doing a classification search. It is recommended that you do this keyword searching first, locate classification numbers for relevant patents, and then proceed with a classification search.

Listed next will be **References Cited [Referenced By]** This hypertext link allows you to check whether there are more recent patents that cite this patent in their list of references. This allows

you to bring your research more up-to-date and benefit from the patent research done by other inventors.

Following this is the list of U.S., Foreign and other cited literature used as background research for this patent. It is very valuable to check the full-text of these U.S. patents to further your research. Checking these references is one way to find patents published prior to 1976. Just click on the patent number to retrieve that patent. Use your Back button to come back to the patent you started with.

Part of the list of cited U.S. Patents. from patent 6,383,623.

5529826	Jun., 1996	Taylor et al.
5578368	Nov., 1996	Forsten et al.
5607531	Mar., 1997	Needham et al.

Suggested Record Keeping:

- While looking at patents you should note the patent numbers on a chart with two columns, those that are relevant and those that are not useful. By keeping track of patents that you have reviewed you will not duplicate this work later when they keep coming up in later lists of patents.
- Also when reviewing patents make a list of the Current U.S. Class numbers that are assigned to the most relevant patents.
- Also while reviewing the title and abstract note other keywords that should be tried. Look for synonyms and varying spellings that you want to include in your search.
- Print out full patents for later reading and for ideas in devising your own application.

This Quick Search shown above retrieved only 5 patents. We now want to utilize more keywords, synonyms, and spellings to make the search more comprehensive. We need to go to the [Advanced Search](#).

When performing an advanced search remember the following points:

- Think of synonyms for each concept in your search. Link synonyms with the OR operand and put each group of synonyms inside a set of parentheses. The parentheses tell the computer system how to perform the logic of your search and which terms stay together as a group.
- Put two and three term phrases inside double quotation marks. You cannot use the truncation symbol \$ when searching a phrase. You need to type out the various spellings and OR them together. See example below.
- Truncate one word terms with the \$ to allow for variant endings on the word. It is often dangerous to truncate on less than 4 or 5 characters because words that you did not want will be retrieved.
- Include abbreviations or acronyms

- Remember to think about which fields you want to search. A chart is provided on the Advanced Search screen with all of the fields that can be searched. You can click on the field name and retrieve information on how to input a search in this field. Possibly start with searching the **abstract (abst/)** to retrieve more focused results. The field name abbreviation and a slash are typed before the search term. Searching all fields or the entire text can often retrieve too many patents which are not relevant. For example the search below when searched on all fields retrieved over 6,000 patents. When searching using the same keywords and logic but restricting to abstract, the result is 242 patents.
- Link your concepts with the AND operator.

Advanced Search screen from the USPTO Patent Full-Text and Image Database:

Query [\[Help\]](#)

Examples:

**ttl/(tennis and (racquet or racket))
isd/1/8/2002 and motorcycle
in/newmar-julie**

Select Years [\[Help\]](#)

Patents from 1790 through 1975 are searchable only by Patent Number and Current US Classification!

The result of a search provides a list of titles and patent numbers that match your search request. The most recent patent are listed first - reverse chronological order. Review the titles and click on titles that you would like to see more information about. You also have the choice to modify your search. This is the point when the list of patents that you have already reviewed will be valuable. You can skip over patents that you have already reviewed. Now you will be able to refine your list of search terms further and determine the best classification numbers to consult. You may also create a list of important or recurring inventors and companies that should be checked. You can do a new search on inventor or assignee name and review all of their patents.

While reviewing patents in the full-text HTML format, you will want to print out relevant patents in the Image format. You need a TIFF viewer loaded on your computer to load these patent image files. See the following [information page](#) on where to find and download a free TIFF viewer for your computer.

The keyword search has been successful, but in order to feel confident of a thorough review of U.S. patent literature you need to re-run these searches in the [Application database](#) and also go on to [Step 2](#) which describes the process of a classification search. See also the [7-Step Strategy](#) recommended by the U.S. Patent Office.

[Go to Step 2.](#)

Step 2: Look up terms relating to the invention using the *Index to the U. S. Patent Classification*.

The [Index to the U. S. Patent Classification](#) is a dictionary-like list of terms describing inventions and their functions, effects, end-products, and uses. It is found online and also is available in print format at SciPTDL T223.A25. To continue with the search for patents related to aramid fiber insulation, we should choose I from the alphabet presented on the search page. In the index of words beginning with I use the Edit - Find command to locate insulation on the page or just scan down the alphabetical listing.

Here is an excerpt from the [Index to the U. S. Patent Classification](#):

Insulation and Insulating

Building wall [52](#) / [404.1+](#)
By lamina [52](#) / [408+](#)
Yieldable [52](#) / [393+](#)

Electric

..... [174](http://www.uspto.gov/go/classification/uspc174/sched174.htm)<http://www.uspto.gov/go/classification/uspc174/sched174.htm> -
[C174S000000](#)

Battery separator [429](#) / [247+](#)
Bridged rail joint [246](#) / [48](#)
Bushings [174](#) / [152 R+](#)
Capacitor winding [242](#) / [441.1+](#)
Ceramic composition [501](#) / [1+](#)
Conductor cover burnishing [29](#) / [90.5](#)
Fluent composition [252](#) / [570+](#)
Handle [16](#) / [431+](#)
Indefinite length conductor [156](#) / [47+](#)
Covering [156](#) / [47+](#)

Lamp sockets

..... [439](http://www.uspto.gov/go/classification/uspc439/sched439.htm)<http://www.uspto.gov/go/classification/uspc439/sched439.htm> -
[C439S000000](#)

Click on the classification code or the subclass numbers that look interesting. This will link to the classification schedule. You should also try to look up the other concepts of the search such as fire, retardant, fabric, fiber, etc. Click on relevant class numbers to transfer to the Manual of Classification.

Look up the appropriate classification code in the [Manual of Classification](#).

The *Manual of Classification* is a list of all classification codes used by U.S. patent examiners. Because the *Manual* is used to categorize all of the more than six million patents that have passed through the U.S. Patent Office, it is a very precise and expansive list, with hundreds of

categories (*classes*) and thousands of subcategories (*subclasses*). Patent examiners assign one or more classification codes to each issued patent, based on the subject matter of the invention. Many patents have 5 - 15 classes and subclasses assigned.

In the [Manual of Classification](#) search boxes type in the class and subclass numbers that you have located while doing the keyword, inventor name, and company searches. Input the class number in the left box and the subclass number in the second box. We will try 428/299.7. Input the number, click on class schedule HTML version, and then scan down and click on SUBMIT.

A. Access Classification Info by Class/Subclass

1. Enter a USPC Classification...

428	/	299.7
-----	---	-------

The resulting list displays the subclass numbers near 299.7 and their corresponding headings.

Manual of Classification listing for Class 428.

- [297.4](#) .. Fiber embedded in or on the surface of a polymeric matrix
- [297.7](#) ... Fiber is on the surface of a polymeric matrix having no embedded portion
- [298.1](#) ... Fibers are aligned substantially parallel
- [298.4](#) Fiber is nonlinear (e.g., crimped, sinusoidal, etc.)
- [298.7](#) Fiber is precoated
- [299.1](#) Carbon or carbonaceous fiber
- [299.4](#) Glass fiber
- [299.7](#) Polymeric fiber

If you scan to the top of this page we see that Class 428 is Stock Material or Miscellaneous Articles. You can use the EDIT - FIND command to go back to the subclass number(s) of interest. At this point you could look at a list of patents for a subclass of interest by clicking on the . Step 3 will describe how going to look at the Classification definitions is important and will broaden your search if necessary or allow you to define exactly the classes of interest.

[Go to Step 3.](#)

Step 3: U.S. Patent Classification Definitions.

The U.S. Patent Classification Definitions contain working definitions for all subclasses in the U.S. patent classification system. They should be used to further clarify exactly what is included and what is not included in each subclass. Go the [Patent Classification Home page](#) to access the definitions.

Continuing from step 2, we have identified that class 428 and subclass 299.7 may be relevant to our search. Click on the subclass number while in the classification schedule to go the classification definitions. It is important to look at the definitions because they provide a longer

description of the technology in the subclass and also see references to other classes or subclasses are often provided. It also describes which subclass this class is indented under in the outline. You should consult this superior or major class as well.

Manual of Classification listing for Class 428: Classification Definitions:

299.4 Glass fiber:

This subclass is indented under [subclass 298.1](#). Subject matter wherein the embedded fibers are glass fibers.

299.7 Polymeric fiber:

This subclass is indented under [subclass 298.1](#). Subject matter wherein the embedded fibers are polymeric fibers.

300.1 Fiber is precoated:

This subclass is indented under [subclass 297.4](#). Subject matter wherein the fibers are coated with a material prior to being incorporated in the polymeric matrix or being affixed to a surface of the polymeric matrix.

You should also scan to the top of the class definitions for class 428 and read the information provided there. The information in the boxes below is copied from the [Classification Definitions for Class 428](#).

Classification Definition for Class 428:

**CLASS
428, STOCK MATERIAL OR MISCELLANEOUS ARTICLES**

[Click here for a printable version of this file](#)

SECTION I - CLASS DEFINITION

This class accommodates certain products of manufacture which are not provided for in classes devoted primarily to manufacturing methods and apparatus. The bulk of the documents are directed to stock material composites, that is, materials having two or more distinct components which are more ordered than a mere random mixture of ingredients.

Certain finished articles, generally of an ornamental or readily disposable nature, are placed herein when this class specifically provides for them. Unfinished articles, e.g., blanks requiring further significant shaping to be suitable for ultimate use, and stock materials from which an indefinite number of usable portions may be cut, are placed herein unless specifically provided for elsewhere. The determination whether a product etc.

This introduction to this class provides valuable information and see references on how the class is organized. Sometimes, the definitions will lead to other related classes and subclasses which might be useful.

One point about the numbering of subclasses, they will not always proceed in numerical order. As new technologies are added to the Classification Schedule, new numbers are inserted at the appropriate point in the class but the class is not renumbered. For example below subclass 687 is followed by subclass 2.

Manual of Classification listing for Class 428. Classification Schedule:

- [684](#) Containing 0.01-1.7% carbon (i.e., steel)
- [685](#) Containing more than 10% nonferrous elements (e.g., high alloy, stainless)
- [686](#) .. Adjacent functionally defined components
- [687](#) . Surface feature (e.g., rough, mirror)
- [2](#) **COMPACTED TRASH OR REFUSE BUNDLE**
- [32](#) **ARTICLE HAVING ORNAMENTAL WOUND OR WOVEN STRANDS**
- [33](#) **PLURAL PARTS WITH EDGES OR TEMPORARY JOINING MEANS**
- EACH COMPLEMENTARY TO OTHER**

Use the EDIT - FIND command to locate subclass numbers within a class.

Click on the [to go to a list of patents for interesting subclasses](#). Review the titles and review the full patent for those of interest. If the list is not interesting, go back to the classification definitions and choose a different subclass or follow a see reference to a different class.

Remember that the advantage of doing a classification search is that you are able to retrieve patents issued prior to 1976. This is still very important for certain technologies. The only problem is that only the patent number is displayed. You can not eliminate patents by reviewing that title and making a decision with this information. You need to access the TIFF image for each patent prior to 1976.

If there are many subclasses of interest in a particular class and they fall within the same number range, it may be advantageous to do a search on a group of classes and link this with a company or keywords. The classification subclass numbers can be truncated when searching to allow searching over a group of subclasses. For example in our current search of class 428, we may decide that there are relevant subclasses over the range 290 - 299. The [Quick Search](#) would be structured as:

Quick Search Screen: USPTO Patent Full-Text and Image Database:

Query [\[Help\]](#)

Term 1: in Field 1: 
 

Term 2: in Field 2:

Select years [\[Help\]](#)

By adding in the keyword from the abstract, the search would be restricted to 1976 to the present.

[Go to Step 4.](#)

Step 4: Read the text of each patent and look at the drawings to see how similar each patent is to the proposed invention.

The U.S. Patent and Trademark Office's website offers the complete text, including drawings, for all U.S. patents that have been issued, 1790-present. New patents are issued every Tuesday and can be reviewed using the [Electronic Official Patent Gazette](#). The patent database is updated weekly. A TIFF viewer, which is a free software, is necessary for viewing the drawings and page images. Instructions for downloading the TIFF viewer is located on the [Patent Full-Page Images](#) page. Click on the IMAGES button at the top of the full-text of a patent to go the drawings and page images. You can only view and print one page at a time. The navigation buttons are on the left and you should use the print icon within the TIFF viewer when printing.

Clicking on the **P** symbol in the classification definition located in [Step 3](#) will generate a list of all of the U.S. patents that have ever received that classification code. The list, which may range from just a few patents to several hundred, and is arranged in order from the most recent patents to the oldest, presented in groups of fifty per screen.

Results of search of the USPTO Patent Full-Text and Image Database for Class 428, Subclass 299.7.

Refine Search	
CCL/"428/299.7"	
PAT. NO.	Title
1 6,458,727	Olefin polymers
2 H2,047	Reinforcement laminate
3 6,407,309	Absorbent sheet or web material and a method of producing the material by dry forming
4 6,391,436	Manufacture of void-free laminates and use thereof
5 6,383,623	High performance insulations
6 6,335,088	Moisture-retentive cooling gel, moisture-retentive cooling gel laminate, and moisture-retentive cooling plaster
7 6,309,377	Non-woven fabric and an absorbent article using thereof

8 [6,306,474](#) [Hybrid fiber-reinforced plastic](#)

The patents in this list may have issued as recently as last week or as long ago as 1790, the date of the first U.S. patent. All must be examined to see whether or not an invention is unique, before applying for a patent. No matter how long ago a patent originally issued, the U.S. Patent and Trademark Office will not allow anyone else to patent another invention that is too similar to it. The enhancements to the invention must meet the criteria for novelty and non-obvious improvements or changes.

Remember when viewing the full-text of relevant patents that you should look at the **Current U.S. Classes** that are listed for more ideas on relevant class numbers. You should also check the **References Cited** [\[Referenced By\]](#) link to check for more recent patents that cite this older patent. Finally you should look at the **U.S. Patent Documents cited** in this patent. Remember to continue keeping the log sheet of relevant and not relevant patents that you have already reviewed and continue adding to the list of class and subclass numbers that must be checked. Also add to the list of inventor's names and companies that may be helpful contacts and need to be searched as well. Finally if you have completed the search in the granted patents database you also need to complete the same searches in the [Patent Application database](#).

After completing a search of the U.S. Patent and Patent Application Full-Text and Image Databases it is time to consider relevant databases that contain company catalogs, magazine and research journal articles and government and technical reports. You also need to consider searching foreign patent databases. See the [Searching for U.S. Patents on the Internet](#) page for appropriate internet links.

Index to the U.S. Patent Classification System

The *Index* is intended as an initial means of entry into the classification system and should be particularly useful to those lacking experience in using the classification system and those unfamiliar with the particular technology under consideration. It is an alphabetical list of subject headings referring to specific classes and subclasses of the classification system.

As a first step in locating a field of search, the searcher should look in the *Index* for the term which best represents the subject matter of interest. If a match is not found, the user should look for terms of approximately the same meaning, for terms of either broader or narrower scope, or for terms which represent a different approach to the subject; i.e. the essential function or effect of the device or the use or application to which the device or composition of matter is put. On finding the identifying numbers of possibly pertinent classes and subclasses in the *Index*, the user should refer to the *Manual of Classification* and ascertain from among the existing choices the precise classification (i.e. class and subclass) of the subject interest. Subject headings in the *Index* are not an alphabetical inversion of the *Manual of Classification*. They are a subjective determination of relevant terms, phrases, synonyms, and occasionally even trademarks which have been selected over the years as the best identifying descriptions of products, processes, and apparatus of patent disclosures. An alphabetical list of the utility class titles and a separate list of the design class titles is located in the front of the *Index*, directly after the Preface. Searchers may find it useful to scan the titles for topics which may be of interest to them.

Manual of Classification

The *Manual* is the listing of the more than 400 main classes and 100,000 subclasses that constitute the patent classification system. It contains a collection of class schedules, a list of the class titles in numerical order by class number and in alphabetical order, a list of the classes by Examining Groups, and a theoretical organization of classes into major groups.

A fundamental principle of the classification system is that each class, or part thereof, is created by first analyzing the claimed disclosures of the U.S. patents and then creating various divisions and subdivisions on the basis of that analysis. All similar subject matter is gathered together in large groupings to create classes. These classes are then subdivided into smaller searchable units called subclasses. The sequence of pattern or arrangement of the subclasses within the classes is called the class schedule.

After the searcher has found the identifying numbers of possibly pertinent classes and subclasses in the *Index*, the user should refer to those numbers in the *Manual of Classification* and ascertain from among the existing choices the precise classification (i.e., class and subclass) of the subject interest. If the *Index* provided both a class and a subclass number, proceed directly to that class and subclass in the *Manual*. If the *Index* provided only a class number, the user should turn to the first page of that class in the *Manual* and then begin to browse the "mainline" subclasses; i.e. any subclass depicted without indentations and presented in all capitals. Start with the first mainline subclass in the selected class and proceed from one mainline class to another until the first one is found which appears to include the subject matter being investigated. Do not consider any of the subclasses depicted in lower case and indented that are subordinate to the mainline subclasses. This is because a subordinate subclass cannot even be considered unless the subclass that it is subordinate to includes the subject matter being investigated. This is true of all levels of subclasses throughout the classification system.

Next the user should scan all of the subordinate subclasses indented one place to the right under the selected mainline subclass until the first one is found which indicates inclusion of the subject matter being investigated. Using this same technique, the searcher should scan the subclasses indented one additional place to the right under the previously identified subordinate subclass until no further levels of indentation are available. It is important to remember that you can not even consider a subordinant subclass unless you have already decided that the subclass that it is subordinant to indicates inclusion of your subject matter. If a subclass does not include your subject matter, proceed to the next subclass of the same level (number of indents) and repeat this procedure until you have exhausted all of the possible subclasses subordinate to your mainline subclass.

Classification Definitions

Each class and subclass in the *Manual of Classification* has a precise definition. Whenever doubt arises as to how the *Manual* defines a class or subclass, or as to the proper subclass choice, the user should consult the classification definition for the class under study. The *Classification Definitions* supplement the *Manual of Classification* in that they contain detailed definitions and illustrations of the kind of subject matter that can be found in each class and subclass, the lines of distinction among classes and subclasses, and references to other classes and subclasses having

related subject matter. The definitions are available on the ASSIST disc of the CASSIS system or on microfiche.

Original and Cross Reference Classification Designations

The Original classification identifies, in the opinion of the patent examiner, the most substantial aspect of the patent. It is always the first classification number listed on the patent. All of the other classifications listed on the patent are called Cross Reference classifications and identify all of the other aspects of the patent. There is only one Original Classification per patent but there can be any number of Cross Reference classifications. If it can be assumed that the classification number being searched represents one of the most substantial aspects of the idea being searched, it stands to reason that other patents issued with this classification as the Original classification will be more similar to the idea being searched than patents issued with this classification as a Cross Reference designation. For this reason, examine the patents on the list with an Original designation first, especially if there are a large number of patents to be examined. These are indicated by the presence of an "O" to the right of the patent number on the list of patents obtained from the "Classification-By Subclass" file. If there are no conflicting patents in the group with Original designations, then go back and examine the Cross Reference designations also. These are indicated by the presence of an "X" to the right of the patent number. Remember that you must examine all of the patents on each list to do a complete patent search.

CASSIS Computer System

CASSIS (Classification And Search System Information Service) is a computer system provided to libraries in the Depository Library program to assist users with their patent and trademark searches. CASSIS files include a Bibliographic Information File containing brief information on patents granted by the U.S. since 1969; the Classification Information files which provide classification information on patents including the complete list of patents granted to any class and subclass since 1790; the ASSIST files which contain the *Classification Definitions*, the *Manual of Classification* and the *Index* in electronic format, and other files related to patent information. CASSIS is a CD-ROM system and is updated every two or three months, depending on the file.