GUIDE TO PATENTS
AND PATENT ACTIVITIES

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Patents in General

Innovation benefits consumers by the development of new and improved products, services and processes. An economy's capacity for invention and innovation helps drive its economic growth and increases standards of living. Technological breakthroughs such as the personal computer, the internet, television, mobile telephones, and modern pharmaceuticals illustrate the power of innovation to increase prosperity and improve the quality of our lives.

Competition as well as patents influence innovation. Both competition and patent policy can foster innovation, but each requires a proper balance with the other to do so.

A patent is a sovereign right granted by a sovereign nation. This right, a property right, rewards innovation and gives its holder (the patentee) the exclusive right to control the manufacture and sale, as well as use, of an invention for a period of years. A violation of this right, patent infringement, is enforceable in the courts of the United States.

This property right can enable enterprises to increase their expected profits from investments in research and development, thus fostering innovation that would not occur but for the prospect of a patent. The patent system requires public disclosure, thus it can promote a dissemination of scientific and technical information that would not otherwise occur.

From an economic perspective, a patent tends to maximize allocative and productive efficiencies. A patent also permits an inventor to capture the returns from his investment in the invention. The patentee does not, however, have an affirmative right to make, use, or sell a product embodying the patented invention, only the right to keep others from doing so.

The metes and bounds of the granted right are defined by the patent claims. The claims are single sentence numbered paragraphs at the end of the patent document. These metes and bounds definitions are an abstraction, as well as a generalization, of an indefinitely large number of concrete, physical objects or manipulative steps, and are interpreted in light of the patent specification that precedes them. The patent specification, in turn, teaches how to practice the claimed invention and is a source of scientific and technical information. Generally, the patent claims cannot appropriate more than that what is enabled by the teachings set forth in the patent specification that precedes them. The patent specification supports that what is claimed. The patent claims also may not take away anything that is already in the public domain. The amount of detail necessary in the patent specification to support the claims is inversely proportional to the degree of predictability in the particular art to which the patent pertains.

A patent is a personal asset – a form of intellectual property. The U.S. statute provides that a patent shall have the attributes of personal property. As any other type of personal property, it may be sold or assigned, pledged, mortgaged, leased (licensed), willed, donated. It can also be made the subject of agreements. Control over this asset may be accomplished by exercising the exclusive rights referred to above, or by permitting others to exercise such rights under the terms of a special contract – a license which can be sole, exclusive or non-exclusive. In any event, patents can provide a competitive advantage. Awareness of patents granted to others can avoid competitive disaster.

Each country has its own requirements on patenting, including standards for what is patentable, formalities for establishing a patent, the effective date and duration of the patent grant, requirements relating to the use of a patent, and annual taxes to maintain it in force. There are also regional patents such as the European patent. Under United States laws, as will be discussed in greater detail below, an invention, to be patentable, must be new, useful, and nonobvious.

The history of the American patent system spans the growth of the Nation. It is written in the constitutional provision unanimously adopted in 1787, and begins with the first Patent Act of 1790 signed into law by President George Washington. The Patent Act of 1836 established permanently the type of patent system operating in the United States today, including the consecutive numbering system. Patent No. 1 was granted to John Ruggles for an invention relating to a locomotive steam engine. Since that time, the Patent Act of 1836 has been refined by numerous patent statutes running down to the present – the 1952 Patent Code, as amended from time to time. To date, over seven million patents have been granted in the United States.

American industry has flourished under the patent system. New products have been invented. New uses have been discovered for old compounds and products. Employment opportunities have been provided for countless people.

In its inception the United States patent system was characterized as an expression of the right of an individual to the fruits of his inventive intellectual accomplishment. Today it operates in a dynamic, research-centered economy at a time when application of the scientific method to the arts of both peace and war is a necessary ingredient of world leadership. And – while the individual inventor remains significant – the spotlight has shifted to the salaried scientist and engineer engaged in group research of the kind that accounts for the sustained whirlwind pace of current technical progress.

U.S. Constitution provides that, "Congress shall have the power ... to promote the progress of science and the useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Legislation implementing that Constitutional provision is found in Title 35 of the United States Code.

Under United States standards of patentability, all patent applications are examined by the United States Patent and Trademark Office for novelty, utility and nonobviousness. It is the patent applicant's responsibility to establish these elements to the satisfaction of the United States Patent and

Trademark Office before a patent grant is made. These standards of patentability now will be briefly reviewed.

Patentable novelty is novelty in an absolute sense, i.e., as long as the invention is not described in a printed publication somewhere in the world. However, patentable novelty and commercial novelty are not necessarily synonymous. A method or device may lack novelty as far as the United States Patent and Trademark Office is concerned, yet be received by the public or a segment of the public as a "new" item.

The requirement for utility is self-explanatory – the invention sought to be patented must have a practical use, whatever such use may be.

In regard to the third requirement, nonobviousness or inventive step, the invention as a whole must be nonobvious at the time the invention was made to a person having ordinary skill in the art to which it pertains. Conceptually this third requirement is much more difficult, because in evaluation of a claimed invention for unobviousness the application of hindsight is proscribed. This is a difficult admonition to follow as a practical matter.

A logical way to make a determination as to obviousness is to review the history of the particular art to which the invention pertains as it existed before and after the invention was made. One must look at what real persons associated with that particular field of technology actually did or failed to do when confronted with the problem, and how did real persons react when presented with the inventor's solution to that problem.

Since June 1995 the life of all U.S. patents is twenty years from the date of filing. For extant patents filed earlier, the term is 20 years from date of filing or 17 years from date of issue, whichever is longer. This patent term is not renewable. A recent law provides, however, that under certain circumstances patents on pharmaceuticals subject to U.S. Food & Drug Administration's (FDA) review may be extended for a time period of up to five years. Administrative delays in the U.S. patent and Trademark Office can also add days to the patent term.

In most countries, and now also in the United States, there is a periodic tax or annuity levied to maintain a patent in force. In some foreign countries there are also statutory requirements that the teachings of a patent be made a commercial reality within a given period of time under penalty of compulsory licensing or forfeiture. That is not the case in the United States, however.

A patent is not self-executing. It is the responsibility of a patent holder (the patentee) rather than the government (the patentor) to police the use of the patent and (a) either bring infringing parties under a license or (b) prosecute them for infringement. If the patent is to be enforced, the patentee is obliged to do so. Also, the patentee is obliged to defend the validity of the patent if it is attacked.

The United States District Courts have exclusive original jurisdiction in patent infringement actions. Patents can also be enforced against foreign-made goods by the U.S. International Trade Commission where a complainant may seek an exclusion order upon showing infringement and meeting certain other statutory conditions.

The patentee has the benefit, though, of a statutory presumption that the patent grant is a valid grant. One seeking to overcome that presumption must do so by clear and convincing evidence. That is, the patent granted by the U.S. Patent and Trademark Office is only prima facie evidence of the exclusive right it purports to establish. The presumption of validity that attaches to a patent may be subsequently rebutted, and the patent invalidated, in a federal court proceeding by third parties formally charged with infringement. To do so, the accused infringer must present clear and convincing proof that the patent should not have been issued. The patentee, as well as any third party, may also request re-examination of a patent upon payment of a government fee and submission of evidence that raises a new issue of patentability not previously considered by the Patent Examiner.

Subject matter eligible for patenting is defined by statute. In particular, any inventor who "invents or discovers a new or useful process, machine, manufacture, or composition-of-matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of the law." The law also provides for the patenting of ornamental but non-functional designs, and of new varieties of asexually produced plants, other than tuber-propagated plants or plants found in an uncultivated state. These categories constitute a general list of subjects that the law deems to be patentable.

There are also subjects that cannot be patented because they are outside the scope of patent laws. These subjects are:

1. Theories.
2. Ideas without a workable plan for implementation.
3. Plans of action.
4. Results.
5. Discoveries of laws of nature or scientific principles.
6. Things immoral or injurious to health and to the good of society.
7. Works subject to exclusive protection under the copyright laws, e.g., books, mask works, art works.

Similar to patent protection is the protection afforded under the Plant Variety Protection Act of 1970. This statute provides patent-like protection in the United States for plants reproduced by seed. This particular legislation is found in Title 7 of the U.S. Code, Sections 2321 et seq.

Having a patent, however, is merely having a piece of paper which states that the inventor is entitled to protection for his property rights. It puts no money in the bank. A patent by itself creates no marketable product, and it does not *itself* prevent others from infringing upon the patentee's rights. The patent provides the basis, however, for *exploitation* of those property rights. That exploitation may take several forms as it does with all forms of property. They may be used to prevent others from making, using, importing, offering to sell or selling physical embodiments of the invention for the more than zero but less than 20-year life of the patent. When the patentee is in a position to manufacture and/or sell his own invention, the right of enforcement is of critical importance. It enables the patentee to prevent others from competing with him in the manufacture, use or sale of the novel contribution that he provided society.

This right to exclude others has resulted in major industries being formed where none existed previously. When the patentee is not in a position to manufacture and/or sell his own invention, the invention may be licensed or sold to others willing to do so.

In addition, patents are a useful source of technical information. The experiments and data described in the Examples portion of the patent specification provide a wealth of information about a particular compound or process. The U.S. Patent and Trademark Office and governments worldwide have done a commendable job of making current and recent patent data available on the Internet. The search options are extensive. Data is readily available in the form of full-text and figures. Chief among these new resources are the Internet websites maintained by the U.S. Patent and Trademark Office (www.uspto.gov), the European Patent Office (www.espacenet.com), the World Intellectual Property Organization (www.wipo.int), the Japanese Patent Office (www.jpo.go.jp), and the Canadian Intellectual Property Office (cipo.ic.go.ca). Basic information about patenting, licensing and commercialization of inventions is available at web.mit.edu/invent/.

Also noteworthy are the new commercial services which offer quick delivery of patent documents and make even early, pre-1970s patent disclosures available at no cost or low cost. Examples here include Pat2Pdf (www.pat2pdf.org), and MicroPatent® USA (www.micropatent.com).

A large fraction of the world's patent documents can now be accessed for free via the Internet. One general cost rule still applies, however. As one moves further back in time, it becomes increasingly difficult and/or more expensive to gain remote, computerized access to patent documents. Only commercial services have attempted to catalog patent documents published before the 1970s. If one knows in advance that patent research should include early documents, it is important to keep in mind the somewhat time-limited scope of the free patent databases.

Patents and a Commercial Enterprise

Products and processes have an evolutionary pattern that passes through several phases:

(1) a research and development phase
(2) a production phase in which concentration is on manufacturing methods and choice of materials.
(3) a period of consolidation emphasizing cost reduction
(4) an improvement featuring further improvements in cost
(5) a period of liquidation and elimination of the product or process.

Patent aspects involve parallel changes:

(1) In the research and development phase, basic patent protection is an important consideration. Possible infringement of a broad patent held by a third party also is a serious danger. During this period, extensive patent searching is important to learn what has been done before in the research field of interest.

(2) In the production phase, detail inventions directed to the best mode of accomplishment are significantly advantageous and can provide additional level of patent protection.

(3) During the consolidation period, patent problems are usually minimal, but royalty income based on earlier success may materially enhance profit.

(4) The improvement stage is again important from a patent standpoint, not only in protecting the company's production but also in maximizing recognition of its work by others. Development of a patent trading position can be of value at this time.

(5) Liquidation of commercial interest in the product or process may cause disappearance of interest in the patent – unless the life of the product or process is shorter than the life of the basic patent which also covers other products. During this period, patents permit benefits to be realized from sale or licensing of the relevant portion of the patent estate.

A complete corporate patent program has four primary aspects:

(1) Patenting inventions

(2) Protecting the company against infringement on the patent rights of others

(3) Prosecuting infringers

(4) Promoting the use of inventions covered by patents, including licensing of patents for royalties or sale of patents.

Patenting

In the United States, a patent may be obtained if a patent application is filed within one year after the invention is disclosed through publication, offer for sale, or commercial use. In many other countries, however, a patent cannot be obtained if there has been any disclosure of the invention to the public prior to the filing of a patent application. Under an international convention, however, a patent application in the United States will preserve for one year the right to file patent applications abroad even though there has been publication of the invention subsequent to the U.S. patent application but before a foreign patent application is filed. Thus, if foreign as well as domestic patent protection is contemplated, the proper approach is to file a domestic patent application before any public divulgation of the invention takes place, and then seek to file the desired foreign patent applications within the ensuing year.

Patents help commercially through increased volume of sales at better profit margins. Exclusivity, by reason of patents, warrants research investment and utilization of advertising and other costs in developing and promoting the patented item. Without patent exclusivity, the market could be split and fragmented, thereby becoming so small as to discourage any entrepreneur from entering or continuing in the market.

Rarely do we know the full cost to competitors of their attempts to circumvent our patents. But we do know that copying often follows the expiration of a patent on a particular product or feature.

Patents give the holder a trading position. Patents may offset one or more of a competitor's patents, and result in a tacitly accepted stalemate or a cross-license, either free or at reduced royalties.

Adequate and early filing of patent applications is particularly important in new, fast-moving areas of technology. When the technology is developing rapidly, important inventions that may be pending in the United States Patent and Trademark Office will be revealed by a search. The application subject matter also is revealed by foreign patents which issue or patent applications that are open for inspection. Substantial investments may be jeopardized by later issuance of patents to others. This danger is minimized by searching the patent data bases and by patenting own contributions made to the relevant field.

A patent provides insurance against issuance of a patent on the same or a similar invention to a later inventor outside of the company. In the U.S., the first inventor and his employer may have a legal defense in an infringement suit or a right to seek an interference and may attempt, belatedly to obtain a patent. However, strict and corroborated proof of prior completion of the invention is required. Good records of invention are very important. The risk of having inadequate or unpersuasive records is great. The outcome of infringement suits and patent interferences is not always certain, but the first inventor has a definite tactical advantage in the U.S.

A patent on a commercially successful product or process improves the patentee's competitive position. Such a patent provides lead time over competitors and may require them to develop a different, independent approach at their own research cost. The cost of further research, licensing or defense of an infringement suit may be a deterrent to competitors.

Patents provide a basis for stopping piracy of a design. Design patents covering the appearance of the product are also important. Failure to patent detailed designs, often considered "unimportant", allows competitors to copy unpatented designs. This provides inexpensive engineering and art work for such competitors as well as a confusingly similar appearance in a marketed product.

Royalty income from patents is an important advantage. From a manufacturer's point of view, royalty income may not be the primary purpose of obtaining patents, although it is a desirable by-product. For some companies research is carried out primarily to produce royalty income. Royalty income can be achieved by licensing a patented invention outside of the company's own area of interest, or in countries where the company does not have a market presence.

Recognition resulting from patents is likely to stimulate research creativity. Since corporate leadership requires continuous creativity, and market position benefits from inventive activity, inducements to spur creativity and inventive activity are worthwhile. Patents and the recognition they bring to inventors are one form of inducement.

The competitive values discussed above apply mainly to patents covering products that are already in commercial production. But patents also have long-range competitive value. Patent protection on long-range objectives is essential even though use of the invention may be speculative or uncertain when the application is filed. Delaying filing of a patent application until the invention is of certain marketability is precarious practice in any rapidly moving area. A United States patent is good for twenty years from the date of filing of the patent application, as stated above. Therefore, considering the usual

prosecution time in the Patent Office of about three to five years, thoughts about the value of patents should be projected for fifteen to seventeen years from the contemplated filing date.

A short sighted view of patent interest can be ultimately troublesome. This has been particularly noticeable in neglecting to file in countries where no significant sales are currently made or contemplated, but finding years later that there was inadequate patent protection for sales or trading purposes in countries and that the competitors have already established a beachhead there.

The long-range aspect of obtaining patents should be considered when determining the amount to be spent on a patent program. Among the factors to be considered in determining a patent program are the state of development of the technology and the number of new products contemplated. This long-range nature of patent work means that current success in obtaining patents will affect the competitive position of both the patentee and competitors for about fifteen to twenty years.

It is dangerous to decrease suddenly and materially the patent effort as a particular research effort is phased out. While an abrupt decrease in research in a particular area can expectedly cause a decrease in further patentable improvements, decreasing the patent effort at the same time may result in failure to obtain adequate protection on research already done in the immediately previous years that could be licensed to an interested third party and generate royalty revenues.

It may also be dangerous to maintain the same level of patent activity when the size of the research staff grows, the technology becomes increasingly complex, and the number of patents and other reference material to be considered in questions of patentability are enlarged. Growth of a research group usually means a higher numerical output of inventions that may require protection.

As the range of products and operations expands, so do patent problems. Corporate acquisitions also entail potential patent problems and require due diligence in evaluating the rights and the liabilities acquired, and also the need to protect the new areas of technology or business.

Good patent administration also involves the promotion of creativity and dissemination of knowledge useful to research and management in making use of the patent estate of the company.

Protection

Even if no patent applications are filed, potential infringement of competitor's patents cannot be overlooked. The infringement status of all new designs, changes and improvements in products or processes should be ascertained. In deciding how much effort is desirable, one must weigh the risk against the cost of investigation. If the risk is small, it may be cheaper to run the risk rather than to incur the expense of investigation.

To be of value, an infringement protection program requires close cooperation between production and innovating personnel with patent counsel to keep each other informed on the status of development and improvement programs on products and processes and potential patent infringements.

To be effective, the program requires a careful review of every new product and process being seriously contemplated for commercialization as well as a review of issued patents to others. Scientists

and engineers in searching the literature sometimes find patents that appear to be infringed or warrant circumventing. Such assumptions should never be relied upon without seeking an opinion of competent counsel as to validity and infringement.

A seriously mistaken impression of validity and infringement is often obtained by technical and even management people when confronted with a patent. The questions of validity and infringement of a given patent are not raised. Not every piece of green paper is legal tender. Not every patent is valid. The enforceable scope of a patent claim may be less than what it initially appears to be. Even if a patent is valid, evaluation of patent scope will help to determine reasonable value to be put on any given patent and to assess potential risks that may be associated therewith.

An adequate infringement protection program requires patent counsel to work closely with technical and scientific personnel not only to determine infringement but also to avoid it whenever feasible and to determine validity of troublesome patents. If necessary, where a patent is both valid and infringed and circumvention of patent claims by design-around is not practicable, a license should be negotiated. It may be less expensive to accept a license than to litigate patent validity or infringement.

Casual treatment of infringement can be very costly. Infringement can subject an infringer to the payment of royalties, triple-damages, as well as an injunction. The royalty terms may be onerous if the infringer's bargaining position is weak, and infringement is discovered after marketing.

Finally, if the patent owner does not wish to grant a license and infringement is established, an injunction may issue. This misfortune could require destruction of inventory and loss of market position.

On the other hand, knowledge of patents by others often reveals clear routes leading toward technological advances free of patent complications.

Prosecuting

An important part of the patent operation is "detecting infringement of patents by others." Patent owners who do not police the unlicensed use of their patents may be throwing away much of their value. Infringements are uncovered largely through observation of advertisements, catalogs, technical papers, trade shows, and products on the market.

Alert scientists, engineers and salesmen can often bring possible infringement to the attention of management. After the existence of infringement is reasonably established, the infringer can be notified and requested to cease infringement or, if management decides, he can be offered a license. Continuous follow-up is usually necessary to achieve resolution.

Dilatory indifference suggesting lack of appreciation of the patent by the patentee will necessarily reduce the return which can be expected for the license. Since the assertion of patent rights may be lead to license negotiations, or to litigation, factors that must be considered include customer relations, the extent of infringement and its effect on the patentee's business, the strength of the patent (that is the likelihood of a court considering it valid and infringed) as well as antitrust laws.

When management's decision is to license a patent, pertinent information must be obtained about the infringing product or process, sales price and volume, and benefits derived by the infringer from the infringing use. The patent lawyer should determine the strength and weakness of the patent to facilitate arriving at license terms to be offered. The terms offered vary with each situation and may include down payment, settlement for past infringement, payment for material lawfully sold prior to issuance of the patent but for which the seller impliedly indemnified the purchaser against infringement, minimum annual royalties and running royalty rate. Perhaps the most important term is the royalty rate to be charged. This is arrived at by considering the protection provided by the patent, the royalty usually charged in the industry, and, of course, the profit margin.

Effective patent licensing negotiation requires knowledge of the patent, the infringing process or product, and the prospective licensee. Terms and royalty limits established by management must be observed. If skillful and aggressive negotiation fails to resolve the problem, the possibility of litigation must be considered.

Litigation is costly. Adequate presentation of a case in court requires a large expenditure of time. Technical people and management are required to participate in strategy decisions, give depositions and give testimony in court. Furthermore, the subject matter is complex and technical and difficult for a non-technical judge to understand.

While it is a good generalization that litigation results are uncertain, this is chiefly because strong patents and weak patents rarely get into litigation since infringers do not seriously challenge the obviously strong patents. Owners of weak patents do not often assert them through litigation.

It is desirable to avoid a reputation of acquiescence in infringement by others of your own patents. To instill in others necessary respect for a good patent position, one must negotiate aggressively and resort to litigation if negotiation fails to achieve the desired result.

Some infringers will not consider licensing until sufficiently serious intent is shown by the patentee to initiate a patent infringement lawsuit. The legal costs are small at this point. Difficult infringers should be assessed as to whether or not they require this indication of serious intent. If the patent position is strong, initiating a suit will quickly effectuate a license.

Promoting

Prospective licensees may be discovered while pursuing the prosecuting functions described above. It is also possible to analyze patents in the company's patent portfolio for worthwhile products or processes and seek out manufacturers who might be interested in making or using our inventions. If prospective licensees are found, negotiation of patent licenses and related technical information and know-how may be achieved.

Such a program of promotion requires analyzing the strength and importance of each patent.

Technical information or "know-how" is often an important commodity which can be licensed to others. Such information cannot be protected against copying unless it is used secretly, or is covered

by patents. It may be of value to a purchaser by giving him lead time over competitors. Here, even patents of relatively minor importance may substantially increase the value of the “know-how” that is sought to be licensed.

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In conclusion, patents can be a valuable resource for the scientist as well as the company. Valuable information can be derived from existing patents as one begins to plan research or development in a particular field of interest. Knowledge of areas subject to patent protection by others can avoid false starts and blind alleys. Your own patents can provide worldwide protection for your own fruits of research as well as assist in the commercial exploitation of your inventions while keeping competition at bay.