

# Patent Pollution: Clearing the Patent Landscape and Protecting Innovation

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## ABSTRACT

With concerns about both energy availability and global environmental issues, investment in clean technologies has risen dramatically over the past few years. Emerging companies have two major obstacles to their ultimate success: to create technologies that are functional and economically feasible, and to navigate the vast body of energy and environmental patents that have issued over the past decade. It is this second problem which is sometimes overlooked and which can doom a company to failure - even if the company possesses a breakthrough technology.

This article will explore the steps that all emerging companies must take in order to benefit from the current economic crisis and to avoid the kinds of patent issues that have plagued and ultimately destroyed many companies.

**Keywords:** patent, intellectual property, clean technology, innovation

## 1 THE PATENT SYSTEM

At the heart of the patent system is the "right to exclude." At the very least, a patent owner is entitled to compensation when an infringer treads on its patent property. For someone who invents, whether it be a new apparatus, a new method, or an improvement on an old apparatus, the patent system allows the inventor to apply for a patent to protect the idea. A U.S. patent application must describe the invention in sufficient detail so that a person "skilled in the art" to which the invention pertains can make and use the invention without having to conduct undue experimentation. In addition, the innovator must include in the application the best way the innovator knows of for implementing the invention.

In simple terms, the application must have enough detail to enable someone else to make and use the invention, and the inventor is prohibited from hiding any of the good tricks that make the invention most successful. An invention must be new, useful, and must not be an obvious variation of the "prior art," that which came before the invention. The precise scope of the patent is determined after some negotiation between the Patent Office and the inventor.

The idea behind the patent system is simple. In exchange for innovators teaching the public how to make and use their invention, the public will give to the inventor a right to exclude others from practicing the invention for a

period ending 20 years after the date of the filing of the patent application. This right to exclude is realized with the monopoly that is a U.S. Patent. Without the patent system, the most profitable companies might be those who are second to market with copycat products, instead of the innovative companies who create the products.

One of the most important concepts in patent law is that a patent does not give the owner of the patent the right to use that which is covered by the patent. Instead, a patent only grants the owner the right to exclude from making or using their particular invention. This concept is illustrated in the following hypothetical:

**Year One:** Innovator A is the first person to invent a hybrid automobile which automatically switches between an electric mode and a gasoline mode. Even though the automobile does not improve energy efficiency, Innovator A is awarded a patent for the broad concept of a hybrid car as the concept is not obvious in view of the prior art. However, the embodiment of the invention described in the patent is not commercially viable because it is expensive and inefficient.

**Year Two:** Innovator B figures out a control circuit which allows a hybrid car to be efficient. Innovator B is awarded a patent for a hybrid automobile which includes a specific control circuit. The reason that the patent is awarded is because Innovator B's invention is not obvious in view of the broad concept of a hybrid car. Innovator B has invented a commercially interesting automobile because of its great efficiency.

**Year Three:** Innovator C improves battery technology and is awarded a patent on an improved battery. The battery can be used in many environments, including use in a hybrid car.

**The Rights of the Innovators:** Even though Innovator B has invented and received a patent for a commercially interesting automobile, the right that the innovator received with the patent is the right to exclude. Thus, Innovator B can stop anyone who makes a hybrid automobile with the control circuit. Unfortunately for Innovator B, he/she can not practice his/her own invention without permission from Innovator A, the inventor of the broad hybrid car concept.

Innovator B may have invested millions of dollars into research and may be in possession of the only commercially interesting hybrid automobile, but Innovator B can not practice his/her own invention without permission from the owner of the broad hybrid automobile patent. In fact, under current law, Innovator A could get an injunction against Innovator B, even if Innovator A's invention was a "paper

patent.” A “paper patent” is one which protects a product or method which is never exploited by the owner. In the hypothetical, the invention of Innovator A was not commercially viable and may well have been a paper patent.

Innovator C is obviously free to sell his battery to whomever he chooses. However, he/she must always make certain that he/she is not inducing infringement by knowingly selling to a hybrid car company which does not have a license from Innovator A.

If the perfect hybrid car uses the circuit of Innovator B and the battery of Innovator C, no company can sell the perfect hybrid car without obtaining the appropriate patent licenses.

The real world does not differ from this hypothetical world. There are many innovations in the energy and environmental arena which are emerging from universities, research laboratories, garages, start ups and large companies. Many of these innovations are protected by patents. Therefore, as the title of this article suggests, the energy patent landscape is polluted. It is polluted with thousands of patents and many of these real world innovators are precluded from legally using their inventions.

This pollution, however, is both a hazard and an opportunity. All of the patents enjoy what lawyers call a presumption of validity. Because a trained Patent Examiner has determined patentability, the patent is presumed to be valid unless it can be shown to be invalid by “clear and convincing” evidence. This standard is not as high as the standard in criminal law (beyond a reasonable doubt) but it is nevertheless an extremely high standard. Juries and judges tend to assume that a Patent Examiner was properly trained and did a thorough job of determining patentability. There is something magical about the fancy document with the ribbon, i.e. the U.S. Letters Patent.

Even though it may take years to obtain a patent, during most of this time the application is in the queue at the U.S. Patent and Trademark Office awaiting examination.

Patent Examiners are given a certain amount of time to examine a patent application. Generally, the amount of time that a Patent Examiner has to examine a patent application will range from 10-25 hours depending on the area of technology and the experience of the Examiner. This is the time that the Examiner has to read the application (which may average around twenty pages but could be as long as one hundred pages or more), look for prior art, and negotiate with the innovator regarding the scope of the patent.

Even though patents are presumed to be valid, there are a few secrets about the patent system which are not generally known by the public:

- Patent Examiners do not always have enough time and resources to find the best prior art.
- Patent Examiner performance is measured by the volume of cases examined more than the quality of the examination.

- Patent Examiners do not generally have a background in either the law or patents when they begin working at the Patent Office. Generally, Patent Examiners only have a technical degree and no other formal training when they are first hired. There is also a high turnover rate as many Examiners attend law school while working at the U.S. Patent and Trademark Office and oftentimes leave shortly after receiving a law degree.

- The ability to enforce a patent depends upon the quality of the patent application drafting and remarks made before the United States Patent and Trademark Office.

- Given the imperfections of the patent examining process, there are patents which are invalid. In addition, the owners of many patents do not fully understand the scope of rights provided by their own patents.

In addition to the historic imperfections in the patent examination system, the U.S. Supreme Court has tightened the standards for obtaining a patent. In short, many patents which issued ten years ago would never issue in 2009. Thus, there is “patent pollution” caused by both strong valid patents which might stand in the way of commercialization and weak invalid patents which clutter the landscape for all who want to sell a legitimate product.

However, before giving up on the patent system, it is important to understand that one of the only ways to protect the investment made in research is to obtain a patent.

## 2 THE PATENT LANDSCAPE

The raw volume of patents in the clean technology space is mind boggling. The purpose of this article is not to provide a definition of “Clean Technology”, as everyone can agree that certain areas of technology fall squarely within the meaning of clean technology. For example, clean alternatives to fossil fuels are generally regarded as being encompassed within the clean technology definition. Would it surprise you to know that the term “solar panel” appears in 3,361 patents since 1975? Table 1 illustrates the number of patents which have issued since 1975 using certain terms common to the clean technology industry.

Clean Technology Term	Number of Patents
Solar panel	3,361
Biomass	10,950
Wind energy	1,427
Hybrid vehicle	2,536
Fuel cell	13,530
Geothermal energy	687
Acoustical heat pumping engine	8

Table 1: Green patents since 1975.

Even technologies as obscure as acoustical heat pumps and a term as narrow as “acoustical heat pumping engine” uncovered eight patents! With so many patents, it is critically important that all companies understand the landscape in their industry. This will enable them to

innovate without being blindsided by a patent infringement suit or a threatening letter from a competitor.

It is worth noting that there is a school of thought that companies should not study the patent landscape because knowing of a patent makes a company vulnerable to a claim of willful infringement. If a company is aware of a patent and ignores the patent, it is possible that it could be found to be willfully infringing. At its discretion, a Court may apply treble damages against a willful infringer, thus tripling the damages award. In addition, if the case is “exceptional”, the infringer may have to pay the attorney fees of the patent owner.

It is a more common view that knowledge is better than ignorance. Knowing the patents of others will enable a company to avoid infringement. As a beneficial byproduct, a company can learn a lot about technology from the patents of its competitors. It can also glean where the industry may be going.

### **3 A FEW STEPS TO AVOID PATENT PROBLEMS**

Best practices dictate that companies in the clean technology space consider taking the following steps to avoid patent problems.

#### **3.1 Take Advantage of Expired Patents.**

There is a basic principle of patent law that an expired patent is in the public domain. A corollary principle is that technologies which are obvious variations of expired patents are also in the public domain. Thus, expired patents can be a rich resource for ideas. In addition, expired patents can provide comfort that a certain technology can be used without a license. Although many expired patents are old, there are many technologies developed during the 1970s and 1980s that have applicability today. It should be noted that not all patents expire due to age. Some expire for failure to pay certain fees which are required to maintain an enforceable patent.

#### **3.2 Leverage the Ideas Found in International Patents.**

Oftentimes an inventor will file a patent application in a foreign country but not in the United States. If this is the case, these ideas can be used freely by a company within the U.S. without a concern for infringement.

#### **3.3 Look at U.S. Patents for Use in Available Markets.**

Just because a patent application was filed in the U.S. does not mean that the application was filed abroad. Generally, a foreign case must be filed within one year of filing the case in the U.S. in order for the foreign country to recognize the U.S. filing date. There are huge markets outside the U.S. for energy and environmental inventions.

Therefore, U.S. Patents may help a company learn new and interesting technologies which it can freely exploit outside the U.S. With emerging energy markets such as China, some of the best commercial opportunities may be outside of the United States.

#### **3.4 Clear Products and Design Around Unexpired U.S. Patents.**

Even though certain technologies may be protected, if a company understands the patent landscape, it is able to avoid infringement. A sad but often occurring nightmare takes place when an honest, innovative company introduces a new product and learns that a particular unnecessary part of the product is infringing on another patent. For example, perhaps a solar panel has a coating with a particular polymer. The coating makes the product infringe. However, a different (non-infringing) coating could have been substituted if the company knew of the infringement problem. Unfortunately, once a solar panel is coated, it may be impossible to “un-coat” the panel. The company is left with inventory that is un-saleable. Although this company failed to clear its product against the prior art, a company can design around current U.S. Patents through a thorough understanding of the patent landscape.

#### **3.5 Invalidate or Amend Competitor's Patent Claims Through the Reexamination Process.**

Unique to the United States, a third party or inventor can have an issued patent reexamined by a Patent Examiner at the U.S. Patent and Trademark Office by submitting prior art patents or publications that raise substantial new questions of patentability. This process, reexamination, is then used to cancel or amend claims in the patent that are not patentable in view of the submitted prior art.

An increasing number of third parties are using the reexamination process to challenge patent validity. This is due to the fact that the U.S. Patent and Trademark Office made a commitment to make reexamination a more streamlined and viable venue for post-grant validity challenges, and because the decision in a recent Supreme Court case, *KSR Int'l Co. v. Teleflex, Inc.* dramatically changed the calculus for determining whether an invention was obvious [1].

Official U.S. Patent and Trademark Office statistics indicate that approximately two-thirds of patents that emerge from reexamination result in some change to their claims. Ten percent of claims are cancelled outright [2]. Where claims are substantively amended, the accused infringers may not be liable for past damages under intervening rights law.

Therefore, due to the level of saturation of clean technology patents, it is very likely that claims in many issued patents are obvious under the new standard. A company can thus clear a path for itself and its technology through the patent landscape by invalidating competitor's claims through the reexamination process.

### 3.6 Procure Patents for Core Technologies.

While it is axiomatic that companies do not have unlimited resources, a company that fails to protect its inventions might as well hand its competitors a bag of money. By failing to protect innovation, a competitor is allowed to legally copy an innovator's unpatented technology by reverse engineering that technology. Instead of spending years of research, a competitor can buy a copy machine! The investment made by a company in research is oftentimes the most valuable asset. The intellectual property of a company (of which patents are a large component) can determine the value of that company. For a start-up which desires to be acquired as an exit strategy, the patent portfolio may not only determine the price of the company, but also whether the deal is consummated. After all, why should a large energy company buy a small start up if it can simply duplicate the technology at a much lower cost?

### 3.7 Obtain Patents for Revolutionary Ideas.

It is not uncommon for a company to make discoveries which do not ultimately end up in a commercial product. Looking back at the innovator who invented the hybrid automobile in the hypothetically posed earlier in this paper, he/she did not produce a saleable product. However, by protecting the invention with a United States Patent, Innovator A was in a position to collect a royalty from anyone who exploited a hybrid automobile in the United States. In the alternative, Innovator A could also prevent others from exploiting the hybrid technology. There are often times business reasons for preventing a competitor from using a technology, even if that technology is not being commercialized by the innovator.

### 3.8 Obtain Patents for Evolutionary Ideas.

Most ideas are not revolutionary. However, if an idea is not obvious, it is proper subject matter for a patent. In addition, an evolutionary idea can be the idea which makes a product saleable. It is often times evolutionary patents which are used as cross licensing fodder. This intellectual property will give a company the currency it needs to negotiate with its competitors to create mutually beneficial licensing agreements. Supporting new ideas in a regular patent program can reward inventors and create a culture of innovation that leads to additional revolutionary ideas.

### 3.9 Find License Opportunities for U.S. Patents.

Due to the current economic crisis, many new and innovative clean technology companies are struggling financially. Companies with knowledge of how to evaluate patent assets can potentially save millions of dollars and several years of research and development cost by investing in the patent portfolios of these struggling clean tech companies.

Additionally, many alternative energy technologies incorporate older inventions, as illustrated in the hypothetical. Licensing will be critical for many of these companies to realize economic viability in their inventions. Without a license, these companies are precluded from bringing their products to market. There are many opportunities to acquire these technologies through licensing, as colleges and universities can transfer their patented technologies to commercial ventures

### 3.10 Take Advantage of Special Provisions of the Patent Rules.

There is generally a motivation to obtain patent protection as quickly as possible. The U.S. Patent and Trademark Office recognizes the importance to the public of inventions which will help the environment and inventions which help relieve our energy problems. For this reason, the U.S. Patent and Trademark Office gives energy related patents examining priority, and will examine patent applications relating to clean technology ahead of other patent applications. This provision of the Patent Office guidelines can be taken advantage of with a simple petition.

## 4 CONCLUSION

It surprises most people to learn that the clean technology landscape includes a plentiful and rich supply of patents. These patents can be deadly weapons if not treated properly. They can also be a source of knowledge and technology, as well as a business opportunity. In tandem with a culture of innovation, an effective patent strategy allows clean technology companies to effectively commercialize their innovations.

## REFERENCES

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