
Inventions and Patents: Forces for National, Company, and Personal Growth

Paul A. Schumann, Jr.

The patent system added the fuel of interest to the fire of genius.

Abraham Lincoln

The Patent Concept

The first written argument in England for a patent was provided by Jacobus Acountius, a citizen of Trent, in 1559 in a petition to Queen Elizabeth:

Jacobus Acountius to the Queen. Nothing is more honest than that those who, by searching, have found out things useful to the public should have some fruits of their rights and labors as meanwhile they abandon all other modes of gain, are at much expense in experiments and often sustain much loss as has happened to me. I have discovered most useful things, new kinds of wheel machines, and of furnaces for dyers and brewers when known will be used without my consent except there be a penalty and I poor with expenses and labor, shall have no returns. Therefore, I beg a prohibition against using any wheel machines, either for grinding or bruising, or any furnaces like mine without my consent.

This argument, although 445 years old, still provides insight into why we have patents. Examine the argument carefully. What Jacobus Acountius says is that he has invested time, money, and creativity into devising something new. He also implies that his machines are novel because he had to discover them, not obvious because he had to search, and useful.

Is it not right, he states that I should be given protection for my work, because of my investigation? The answer, still found in our patent system, is yes - if you agree to teach others what you have learned. This unique arrangement of exchanging a temporary monopoly on the use of an invention for revealing the concept has stood the test of time and is a valuable ingredient to our economic system.

In antiquity, the patent concept was very broad. It was granted by monarchy to establish rank, precedence, land conveyance, monopoly, and invention. The earliest known monopolies were granted to cooks in about 500 BC in Sybaris, Greece for unique dishes.

The patent concept, as we know it, evolved from this through Greece, Rome, Germany, France, and England. There was much abuse of patents as they were handed out to friends of the ruling monarch even if they did not do the work on the invention. Patent law precedents for the current system were most influenced by Queen Elizabeth in England.

Article I, Section 8, of the Constitution of the United States, includes this statement:

The Congress shall have Power...To Promote the Progress of Science and useful Arts by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

A "patent" protects an "invention." Every year there are more than 100,000 people who have ideas that they feel should be rewarded with a patent. That is where the patent system plays a vital role in today's economy. As Dr. Chester Carlson (the inventor of xerography) said:

It takes patience to stay with an idea. In my case, I am sure I would not have done so if it were not for the hope of eventual reward through the incentives offered by the Patent system.

The Value Of A National Patent System

The patent system lies at the heart of our nation's economic progress. Examples abound which illustrate how virtually our entire industrial machine has been built under the stimulus that the U.S. patent system gives to the creation of intellectual property.

The importance of a strong patent system is now recognized worldwide. Early respect for the U.S. patent system came from the British in the War of 1812. Even though they burned virtually every building in Washington, D.C., the British recognized the building housing the inventive ideas of Americans. It was so important that it was deliberately spared-thus preserving those ideas for all mankind.

The Japanese, in 1890, after reviewing all of the possible causes for the tremendous economic growth in America, concluded that the patent system was an essential ingredient in that growth. Thus, they adopted a patent system themselves.

The statute defines patent protection as "...the right to exclude others from making, using, or selling the invention throughout the United States..." Although technically a patent gives the inventor only the right to exclude others, as a practical matter, it generally gives him/her, the right to exploit the invention. Except for patents on ornamental designs, which are granted for terms of three - and-one-half, seven, or 14 years, a patent is granted for a term of 17 years from the date on which it is issued. The exclusive patent right can be exploited by the inventor by:

- Manufacturing, using, or selling the invention himself
- Licensing others to engage in such activities
- Selling the patent outright

Patents give incentives for people to make inventions, to invest in research and development, to make new or improved products and processes available to the public, and to disclose their inventions instead of keeping them secret. Patents are property.

The History Of Patents In The United States

The issuance of patents in our country actually dates back to colonial days. In the colonies, it was quite natural that the issuance of patents-which carried forward the English patent law tradition would be focused on products and processes of a basic economic character. The first patent granted on the continent was to Samuel Winslow in 1641 for his method of extracting salt. Soon afterward, there were patents for the production of candles, canvas, linseed oil, paper, pitch, soap, and the grinding of grain. This practice continued under the new Federal Government.

President George Washington, in his address to the Congress on January 8, 1790, urged the representatives to give encouragement "...to the invention of skill and genius at home." On February 16 of that same year, Congress presented the President with the first patent bill, "An Act to Promote the Progress of Useful Arts," which he signed on April 10, 1790. The first U.S. patent issued under this act was for the making of potash-a chemical used in the manufacture of soap. This patent, issued to Samuel Hopkins of Pittsford, Vermont on July 31, 1790, was duly signed by President Washington and by two members of his cabinet: Attorney General Edmund Randolph and Secretary of State Thomas Jefferson.

Thus, a person with an idea could obtain legal recognition and the exclusive right to develop and profit from his idea. Less than 70 years later, the young United States of America-with a population far less than that of Great Britain surpassed that country in both industrial technology and the rate of inventions.

The first patent act delegated complete power to grant patents to a Board consisting of the Secretary of State, the Secretary of War, and the Attorney General. Since these three officials had much other work to do, they were unable to devote adequate time to patents. Not only were they unable to handle the volume of work, they were not prepared to handle conflicting claims. For example, four inventors claimed the steamboat. On February 11, 1793, a new act placed the issuance of patents under the direction of the Secretary of State in the Department of State. It was here that the Patent Office came into being as a distinct bureau in 1802.

To obtain a patent under the 1793 act, there was no formal requirement other than submitting a description, a drawing, a model, and the necessary fee, \$30.00. This was an over-reaction and a real step backwards. The applicant for a patent did not need to establish the "newness" of the invention. Aliens could not apply for patents in the United States-the only time in our history that was true.

Because of the workload, the Secretary of State delegated the patent job to the Superintendent of Patents, William Thornton, the same architect who designed the U.S. Capitol. In 1812, Thornton talked the British into sparing the building containing U.S. patent records. They burned virtually every other government building in Washington.

This system of issuing patents without any examination for novelty resulted in numerous conflicting patents. It remained in force until 1836, when patents were, being issued at the rate of some 600 per year, and dissatisfaction had become widespread.

By 1836, the United States was among the leaders of the Industrial Revolution. Some 10,000 patents had been granted, although they were impossible to research since no numbers had been assigned: They were -filed by name and by type of product.

To correct the situation, an act was passed on July 4; 1836 which, among other provisions, reintroduced the examining system used under Jefferson and which called for novelty proof. Additionally, the act designated the officer in charge as Commissioner of Patents. This Act of 1836 was amended from time to time. By an Act of Congress on July 19, 1952, our patent laws were

revised and codified, and it is under these provisions that the Patent and Trademark Office currently operates.

In 1836, the fee was still \$30 for U.S. citizens. It was \$300 for citizens from other countries, except those from Britain. British citizens had to pay \$500, perhaps in retaliation for the War of 1812. In addition, a numbering system was established to keep track of patents.

The Patent Office remained under the jurisdiction of the State Department until March 3, 1849, when it was transferred to the newly created Department of the Interior. It remained under this Department until April 1, 1925, when it was transferred by Executive Order to the Department of Commerce, its present location. On January 2, 1975, the President signed Public Law 93-596, changing the name of the agency from Patent Office to Patent and Trademark Office, in order to provide the public with a more accurate description of the functions of the agency.

Each applicant had to submit a drawing, specifications, and a small patent model. The requirement for models generated new occupations in Washington, and scores of model shops sprung up to produce one-of-a-kind models for inventors. Abraham Lincoln, unable to pay to have a model built, carved his own for a patent he received in 1849. That model is in the Smithsonian today.

As you can imagine, the models consumed huge amounts of storage space. They were displayed in glass cases and gradually filled up building after building in Washington.

Major fires in 1836 and 1877 destroyed 85,000 models! Because of the storage problems, the Patent Office made models optional in 1870 and banned them altogether in 1880 except for applications for patents for flying machines and perpetual-motion devices.

It's good they stopped requiring wooden models. Imagine trying to develop a wooden model of a software program!

- Some other interesting patent activities were taking place during this time:
- The Republic of Texas issued 14 patents between 1836 and the time it became a state.
- The Confederacy issued 256 patents.
- A number of foreign countries developed patent systems, many of them modeled after ours here in the United States.

A number of interesting developments in patent activity have happened during the 20th century. Patents were granted for plant varieties in 1930. And, in the 1980s, patents have been granted on:

- New life forms created in laboratories—a genetic variation of a mouse, for instance.
- Computer software.
- Mathematical algorithms for computing certain types of problems.

Also, in the 1980s, a change in patent laws helped pharmaceutical firms, which previously had to count years of testing against the 17-year duration of any patent they might receive.

The history of patents in the United States has been an explosive one. For the first four years after the patent law was enacted in 1790, only 57 patents were issued, an average of 14 per year. In 1850, 944 patents were issued. In 1890, 35,130 patents were issued. By mid-year 1935, 2,000,000 patents had been issued. While it took 145 years to reach this number, it only took another 41 years, 1976, to add another 2,000,000.

Growth in the number of patents awarded has been significant and indicates the rapid technological development now in progress (see Figure 1). The time period for each million patents generally is growing shorter, as more foreigners apply for U.S. patents and as technological developments continue to accelerate.

Patent Number	Date	Years per Million Patents
0	1836	
1,000,000	1911	75
2,000,000	1935	24
3,000,000	1961	26
4,000,000	1976	15
5,000,000	1990	14
6,000,000	1999	9

A special celebration was held from May 11-13, 1990 in Washington, D.C. to mark the 200th anniversary of the Patent and Copyright Act of 1790. It's been a tumultuous 200 years in the patent office, but despite those difficulties, our patent system ranks as one of the best in the world.

What Is A Patent?

The conditions under which a patent will be issued have evolved over the years. Currently, there are three primary conditions. Patents are issued for new, non-obvious, and useful inventions. The patent law states that anyone who "invents or discovers any new and useful process, machine, or any new and useful improvement thereof, may obtain a patent" for his invention.

Newness. The invention must be novel. An invention is not new if there has been previous public knowledge of the invention. For example, if the invention was publicly used or on sale in this country before your discovery, you cannot obtain a patent. If your invention was publicly used or put on sale more than a year before you file a patent application in this country, you cannot obtain a patent. Indeed, other countries are even stricter on divulgence. If it can be shown that someone else had invented it in this country ahead of you and this other person had not abandoned, suppressed, or concealed the invention, then you cannot obtain a patent. Any patent or publication on the same invention anywhere in the world that precedes your conception date by even a day, or precedes your filing date in the United States by more than a year, is a bar to your obtaining the patent. In patent language, novelty has a very special meaning. It does not mean the newness that is associated with a person who, upon reaching a certain state of sophistication, learns an old principle for the first time. It means that the contribution is different from anything known and available as prior knowledge and information.

Useful. The invention must process utility. The patent law requires that, in addition to being new, a contribution must also be "useful." This means that the invention must be more than a mere idea. It must be more than an identification of a problem to be solved or of a result to be obtained. The invention must be operative and the description thereof must be complete enough to enable a person skilled in that particular art to realize the desired result. In line with this, principles of nature and methods of doing business are not patentable. No patent is granted on a mere idea or suggestion.

Patentable Invention. This is something more than ordinary skill. Besides being new and useful, your contribution must also be the result of an inventive faculty. This means that the step you have taken must be one that would not have been obvious to one of ordinary skill in the art to which the invention pertains. A change in degree, size, form, material, position of parts, portability, and

durability ordinarily does not amount to patentable invention. Too often, it is believed that if a device is new and useful, this, in itself, is enough to warrant obtaining a patent. This is not the case. An acceptable "rule of thumb" that may be applied in attempting to discover whether a contribution is patentable is as follows:

A new and useful contribution may be considered a patentable invention if the contribution would not have been "obvious" to a person having ordinary skill in the art to which the concept pertains. In determining whether or not something is obvious within the meaning of the patent laws, it must be assumed that the inventor was aware of all prior art knowledge that is relevant to his invention.

Each determination of obviousness must be based on its own merits and no two situations are ever exactly alike.

The Value Of Patents To Companies

Seeking patent protection on selected inventions, and publishing others, is part of a vital multi-purpose business strategy.

A primary purpose is to free the professional to perform research and development that leads to the most advanced and most demanded products that can be manufactured and marketed-with minimal patent concerns. By acquiring patents to inventions that can be used .by other companies, the company can use its patents to trade for rights to patented inventions owned by others. This kind of trading has not only made useful inventions available; it has also saved billions of dollars over the years.

Market driven companies, in order to meet and anticipate the needs of the marketplace, must have complete freedom of action to design products and provide services that are the very best - excellent. A strong patent portfolio provides freedom of action to provide customers with the very best solutions; solutions customers deserve and have the right to expect.

And, companies need the freedom of action and benefits provided by the U.S. patent system to establish a sustainable competitive advantage. Patents can assist in meeting business objectives.

Another important purpose involves requiring others to pay patent owners a reasonable royalty for permission to make, use, or sell the patented technology. This can result in the company receiving income while, at the same time, ensuring that others do not receive a windfall from the technology.

An additional benefit of acquiring patents is recognition of the company and its inventors for their major contributions. This, in turn, stimulates others to become inventors.

After filing for a patent or for innovations less likely to affect business purposes and, therefore, not patented, publication is recommended. Publication helps to preclude others from obtaining patent protection on discoveries similar to those already made by the company's inventors while enhancing their image.

By seeking patent protection on selected inventions and publishing others, a company can achieve a number of business purposes efficiently and economically.

The Value Of Patents To The Individual

Inventing and then seeking a patent on your invention is a valuable asset and is an important part of your professional and personal growth.

Patents have economic value to you! Many companies offer awards for patents. These can be cash awards, plateau systems, or profit sharing.

Obtaining a patent gives you recognition for your contribution. It is tangible evidence, permanently rewarded, that you have created something of economic value. It has been reviewed by your peers and management and considered worthy. It is rare that you can specifically point to a single accomplishment clearly identified. The patent is given publicity both inside and outside your company.

Patents are an important ingredient for promotion, especially to the higher technical positions. Patents are a part of your professional credentials that are easily transferable.

Obtaining a patent is a challenge. It is a puzzle. Once the rules of the puzzle and its language are understood, it becomes easier to clear all the obstacles.

Patenting is a learning experience. For the first time, you may understand your new idea.

Patenting is fun. It is very rewarding to see the tangible evidence of the creative powers of your mind brought to fruition by your productivity.

About the Author

Paul Schumann is the editor and publisher of the Innovation Road Map Magazine (www.theinnovationroadmap.com) He can be reached at paul@theinnovationroadmap.com or 512.302.1935.