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Safeguard Your Intellectual Property

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The use of intellectual property (IP) can make or break a designer or a company. Most engineers are inventors of one form or another, with many using their creative skills in the pursuit of some interesting and groundbreaking endeavors.

However, many could use some education in the basics of IP law.

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Big patent disputes are a major part of American history. Alexander Bell invented the telephone, right? Maybe not. Telephone-type devices by Daniel Drawbaugh, Elisha Gray, Antonio Meucci, and Philip Reis all predated Bell. A patent dispute that went all the way to the Supreme Court left Bell as the victor, and history has largely forgotten the others.

Early in the history of the PC, Apple, Xerox, and Microsoft fought a legal battle over the IP rights of the graphical user interface. Now, Apple and Samsung are heavily tied up in lawsuits over smartphone patents. Patents and the turf wars they create are an integral part of history and the development of science and technology.

IP is not just about patents, however. In the United States the patent has several variants, and the use of copyright or trademark methods sometimes may be more appropriate to retain ownership and control of your creations. Trade secrets also often are used to protect a device when the method of the invention is not easily determined by inspection or the market moves too quickly to use the slower patent process.

Copyrights

Copyright law covers items of expression, which encompasses a broad range. Copyright law typically protects literature, music, works of art, video game graphics, software, movies, and television productions.

The copyright term was extended in 1998. It is now for the life of the author plus 70 years. For works of “corporate authorship” such as movies and television shows, it is 120 years after creation or 95 years after publication, whichever is shorter. At the time this bill was in Congress it was commonly referred to as the “Mickey Mouse Protection Act” due to special interests wanting such long periods of validity.

One of the most visible creations protected by copyright is the “Happy Birthday to You” song, which is still under active copyright. Even though it’s probably the most recognized song in the world, it requires royalty payments to use. Most

television and movie productions avoid using the song, or expect to pay for it.

Copyrights associated with software, music, and other entertainment media suffer the most common violations. Free music download sites like Napster were shut down due to clear violation of copyright. After that, peer-to-peer file sharing blossomed. Although clearly they were violating copyright law, the violators were spread out and more difficult to find and prosecute. Today, bit torrent software makes the offender even more elusive by creating a distributed downloading protocol where the digital file has been broken up into smaller parts and distributed among multiple hosts. The legal system is still struggling with how to deal with some of these issues.

Trademarks

Trademarks can be symbols, words, or phrases that are unique to a particular manufacturer's products. Company logos are considered trademarks, and tag lines associated with a company also would be covered under trademark law. Apple, Google, General Electric, and McDonald's have some of the most recognizable trademarks in the world. Taglines like "Got Milk," "Think Different," "We Try Harder," "Tastes Great Less Filling," and "Intel Inside" were all designed and promoted to quickly bring a product image to mind.

Trademarks do not expire, but loss of ownership can happen when the trademark is abandoned or becomes generic. Terms such as videotape, cellophane, aspirin, laundromat, and zipper were all trademarks at one time. The General Electric logo has been around since the 1890s, and "melts in your mouth not in your hands" has been in use since 1954. Trademarks can have timeless staying power.

Trade Secrets

Trade secrets offer no legal protection, but are useful in several areas. If a technology is quickly developing or has a short life cycle, companies can hide its development and quickly launch it to successfully protect themselves. By the time an imitation is produced elsewhere, the product has largely run its life cycle. If the functionality of a device can't be easily determined by inspection, there is some IP protection there.

However, reverse engineering and knockoff copies makes this a risky path. Some notable trade secrets include Coca Cola's formula, Kentucky Fried Chicken's herbs and spices, WD-40's formulation, and the definition of the Google algorithm. In some cases, the trade secret is used as a marketing tool more than anything else. My reverse engineering of KFC's formulation has determined that salt and pepper are two of the 11 secret herbs and spices, so, only nine more to figure out and I can make fried chicken that's finger licking good.

Patentability

For something to be patentable in the United States, it needs to meet certain criteria. First, the device must be new or novel in some aspect. Second, it needs to be useful in some form. Finally, it should not be obvious to someone skilled in the patent's area.

The new or novel requirement generally is satisfied through a prior art research process. A thorough prior art search can be a humbling experience due to the multitude of earlier efforts in some areas. The useful criteria is easily met, with many examples of devices of questionable utility clearing the requirement. (See USPTO US5443036, "Method of exercising a cat," as an example.¹) Whether something is obvious or not can be argued, with many engineers having the perspective that something is obvious and not patentable. (See USPTO US 8519564 B2, "Multi-output power supply," for something most EEs would consider obvious.²)

The power supply patent is a good illustration of patents that do issue even when prior art exists. Often, the validity of a patent gets decided in a courtroom after it issues. The utility and non-obvious requirement are loosely interpreted, and the prior art requirement tends to be the most difficult requirement to meet.

Different Types Of Patents

Patents come in several major variants: design, utility, and plant patents.

The plant patent is probably of the least interest to EEs, although it is invaluable to those in agriculture. The United States Patent and Trademark Office (USPTO) started to recognize plant patents in 1930 due to legislation passed by Congress. Luther Burbank, a prominent plant breeder of the era, had developed hundreds of unique and useful plants, and a method to protect that form of IP did not exist.

Today, new plants created by genetic engineering generates a steady stream of plant patents. Genetically modified organisms (GMO) can be advantageous, although controversial. The plant patent provides coverage for 20 years from the filing date.

The design patent has a misleading name. A design patent protects the ornamental aspects, or appearance, of a device. Some examples of design patents would include the style and shape of an automobile, a particular style for sunglasses, or the shape and style of a necklace. You could not obtain a utility patent for a car, sunglasses, or a necklace due to the existence of prior art. Design patents are easy to get but also easy to circumvent with ornamental changes.

The design patent is valuable where the shape and appearance is an important part of the product. In the electronics arena, wearable technology is the latest thing, and design patents are issuing on items with a decorative aspect. Wearable technology is being meshed with jewelry, and the physical appearance is an important part of the product. Devices like the iPhone, where physical appearance is inherent to its marketing, also often are covered by design patents. The design patent provides 15 years of coverage from the date granted.

The utility patent is the general-purpose workhorse of our patent system. It is issued for the invention of a new and useful machine (electrical or mechanical), manufacturing method, material, or composition of matter. New variations or improvements upon prior inventions are a big part of this as well. The utility patent now has a term of 20 years from the date of filing.

First To File And The Provisional Patent Application

The America Invents Act of 2011 enacted a major change to patent law, namely the “first to file” instead of “first to invent” rule, which the United States used to operate under. Precedence of the inventor now falls to the first to file documents with the USPTO. A Provisional Patent Application (PPA) can be put together and filed with 24 hours of effort, so this is an easy rule to follow.

The PPA can be a very useful tool for the independent inventor. Typically, patent attorneys will advise you toward a full patent filing so they can then collect the \$10,000 to \$20,000 in legal fees for the application. However, the inventor can file a PPA. Filing fees are usually under \$200, and the invention date is legally established. You then have a year to determine whether the idea filed on has merit and is worth the additional expense to file a patent on. A full patent filing is within the skills of typical engineers if they choose to do so.

Patent It Yourself?

If you are interested in writing and filing your own patents, several books are essential. *Patent Pending In 24 Hours* (Stim & Pressman, Nolo Law) will guide you through the PPA process. If you decide to process and file on your own, *Patent It Yourself: Your Step-by-Step Guide to Filing at the U.S. Patent Office* (Pressman, Nolo Law) and *How to Make Patent Drawings: A Patent It Yourself Companion* (Lo & Pressman, Nolo Law) will get you through the process. There are many specific guidelines on form, structure, and the picky legal wording of claims. The Pressman book (now in its 15th edition) is the bible of the process.

Conclusions

Without careful IP protection, you can be sent on a death march if competitors bring out similar products. If you produce a popular product, someone will come out with a competing product if they can. As an engineering designer, you need to recognize what is new and unique about what you create and make sure that it gets appropriate protection.

Big organizations have IP lawyers to consult with and deal with the process. Independent designers and entrepreneurs often need to take matters into their own hands and deal with this issue early in the creative and design cycle. I'm not a lawyer. But having been caught in the middle of a number of IP wars, and filed my own patents, I have learned that you need to have appropriate protection in place to survive.

References

1. "Method of exercising a cat," <https://www.google.com/patents/US5443036>
2. "Multi-output power supply," <https://www.google.com/patents/US8519564>

Jerry Twomey has been involved in IC and PCB design since 1979. He has designed multiple consumer, commercial, and medical products including data communication, satellite systems, video, medical instrumentation, disk drives, cell phones, RF transmitters and receivers, and many others. Mixed-signal systems and design are his primary focus with a special interest in things not easily defined or solved. In addition to design, he teaches in both industry and academia and is a Senior Member of the IEEE. He holds an MSEE from Worcester Polytechnic Institute. He can be reached at jerry@effectivelectrons.com.

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