

# Professional Issues and Ethics Current Hardware Patent Practices and Regulations

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# 1 Introduction

**Investigate Current Hardware Patent Practices and Regulations in the USA and provide some comparisons to other countries**

In this essay we will be examining laws related to the issue of hardware patents, with a focus on the United States of America. We will be looking at the history of the patent system, reasons why patent systems are in place, analysing the cost of patenting, and looking at the problems various patent systems suffer from.

We then examine the patent laws in the United States in detail, and compare them to patent systems in other countries, Australia, China, and the European union. In particular, we will be looking at how the Free Trade Agreement (FTA) affects patent and IP laws in Australia. We will also look at how governing bodies such as the World Intellectual Property Organisation (WIPO) and the World Trade Organisation (WTO) effect the IP landscape.

We look at some notable hardware patents issued in the US, and some issues pertaining to these.

Finally, we look back at our analysis and see where the patent system is heading, both on a local, and international scale. We look at who really benefits from patents, rehash who the losers are, and the importance of being informed of current laws, as Engineers.

## 2 Intellectual Property and Patents

### 2.1 What is Intellectual Property?

Intellectual property refers to the intangible or intellectual nature of works or creations and the body of laws governing such property. [10]

Products of the human intellect are obviously valuable. A body of laws exists which aims to make such value tangible, and allow inventors and creators to enjoy property rights over what they produce.

Such laws seek to provide incentive for creators and intellectuals to partake in creative works, to develop new technologies and to advance fields of human endeavour.

The three main categories of intellectual property are trademarks, patents, and copyright.

### 2.1.1 Trademarks

A trademark is a word, phrase, slogan, design or symbol used to identify goods and distinguish them from competitive products. Trademarks are either explicitly registered, or accrue through common law usage in countries with legal systems based on English common law.

### 2.1.2 Copyright

A copyright is a legal right endowed on an author, composer, or publisher of a work giving exclusive right to publication, production, sale and distribution. What is protected by copyright is the “expression”, in the specific form it was created, not the idea, theme, or concept expressed in the work, which others are free to reinterpret. Copyright laws also govern rights to prepare derivative work, to reproduce the work or portions of it, and to display or perform the work in public. Such rights may be sold or transferred to others.

### 2.1.3 Patents

A patent, by definition, is the conferment of an exclusive right, namely one issued by an authority or government[19].

Legally, a patent principally refers to the exclusive right to make, use, or market an idea, making ideas into tangible products.

Unlike copyrights which are an exclusive right to make use of a work, patents are a right to exclude others from making, using, offering for sale, selling or importing the invention[15], for a fixed amount of time.

Another major difference between copyrights, and patents is that copyright applies to a tangible piece of work. Not the subject matter, or the idea behind the work, but the work itself. Patents are different, in that they apply to the *idea*, not the actual work. They make a design, a fundamentally intangible thing, into something tangible, which the holder can market, and sell.

In order to be granted a patent, an inventor must disclose the method used or

proposed to come to an invention. This means that theoretically, once a patent has expired, the use of such methods falls into the public domain. A patent is also usually only enforceable in the jurisdiction in which it was issued, as the act of enforcing patents is up to the court system.

## 2.2 A Brief History of Patents

Although the exact origins of patents is unclear, they can be traced back to 15th Century Britain when the Crown made specific grants of privilege to favoured manufacturers and traders. The earliest known patent for an invention given in England was granted to John of Utynam in 1449, by Henry VI. The patent gave John a 20-year monopoly over for a method of making stained glass[12].

At the time of Elizabeth I, patents were used as a means to grant monopolies but this was revoked by James I in 1610 as a result of public outcry.

The patent system in the US was instituted by President George Washington in 1790, enshrining an inventor's right to profit from his own invention into law.

"Congress shall have the 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." - U.S. Constitution Article 1. Section 8.

Prior to 1790, it was necessary for an inventor to make a special appeal to the governing body of the Colony or State to protect the invention. The first such patent in the US was granted by the Massachusetts General Court to Samuel Winslow in 1641 for a novel method of making salt. George Washington signed the first United States patent grant on July 31 1790, and the patent examiner was Thomas Jefferson. The first US patent went to Samuel Hopkins of Pittsford, Vermont for a new method of making Potash, an industrial chemical used in making soap, glass, fertilisers and gunpowder. In 1790, the fee for a patent was \$4.

The US system was distinct from the system in the United Kingdom, as patents were granted by law, rather than being a provision from a monarch.

In Australia too, the patent office dates back to the days of federation.

## 2.3 Types of Patents

The United States patent office lists three types of patents[15]:

- Utility patents may be granted to anyone who invents or discovers any new and useful process, machine, article of manufacture, or compositions of matters, or any new useful improvement thereof;
- Design patents may be granted to anyone who invents a new, original, and ornamental design for an article of manufacture; and
- Plant patents may be granted to anyone who invents or discovers and asexually reproduces any distinct and new variety of plants.

Provisional Patents are relatively new form of protection for inventions which is very simple and inexpensive to file and which allows the owner to use the term "Patent Pending" for a period of one year. However, a Provisional Patent Application can not become a patent, expires at the end of one year and can not be renewed or extended.

"Hardware" patents, as discussed in this essay, generally fall in either the Utility or Design category. By hardware patent, we are referring to patents other than those on pharmaceuticals and drugs, chemicals, plants, and software.

## 2.4 Why Issue Patents?

Patents are a means to protect the right of an inventor to make profit from his or her invention exclusively. Patents are designed to encourage investment in innovation by securing such investments.

The following justifications have been provided for the issue of patents[20]:

- A person has the natural rights to own and control things that he puts labour to.
- Patents encourage and reward innovation and creation.
- Patents encourage dissemination of information and ideas.
- Patents give recognition of property right endeavour on the basis that it create more efficient use on resource.



- Protect consumers from making ignorant decisions between goods and service from difference sources.

Patents give a legal safe-guard for inventors, allowing them to publish their work without fear of it being used for profit against their consent. A patent allows an inventor to talk about his or her work with investors, or discuss the work in academic circles without the ownership of the work being compromised. It puts knowledge in the public domain but retains the authors exclusive right over the knowledge.

A patent can offer more legal safeguard than a non-disclosure agreement as it applies universally in the district it was issued in, whereas an agreement only binds the parties involved.

In the following section, we discuss some objections to the above arguments.

## **2.5 Objections to Patents**

### **2.5.1 Stifling innovation**

Since unlike copyrights, patents are issued on an idea, not an actual innovation, they may hinder the implementation of the idea, or even improvements upon an idea.

With patents the cost of innovation is higher, as the burden of searching for previously patented ideas lies with the innovator. Since this search may not even be conclusive, it leads to the possibility of litigation for every new product marketed.

In many companies, the money traditionally put aside for R&D is now spent on the acquisition, and protection, of patents. Many large company R&D departments now consist mostly of lawyers and too many companies are spending money on patent lawyers, not research [11].

### **2.5.2 Cost of patenting**

In his report[22], John Orange examines the cost of patenting a simple product using the international patent system. The steps he took to patent the invention are summarised below:

1. An initial search to determine the patentability

2. An initial filing to establish a priority date
3. A review after one year of commercial interest, updating of the application and filing in other countries of interest.

This process ended up costing thousands of dollars, even though the product was simple, and the people doing the searching were experienced professionals. Since patents are only enforceable in the jurisdiction issued, many people elect to apply in many different countries.

Applying for a patent is only really viable for large companies, and for products that are going to be fairly profitable. Even though actually applying for a patent is cheaper for an independent inventor, than for a large company, an independent inventor is unlikely to have the funds to do the searching required to apply for a patent, or have the funds to prosecute any infringements.

### 2.5.3 Cost of protecting a patented product

As the burden of protecting and prosecuting a patent falls solely in the hands of the patent holder, to protect a patent, or invention, the patent holder will have to spend thousands of dollars in order to perform searches for infringements, and prosecute them.

According to Orange's[22] report, the cost of perform a search for infringements is upwards of \$10,000 (CAD) and the cost of hiring competent Counsel if there is a real risk of infringement is between \$15,000 and \$30,000 (CAD). This is before any persecution takes place.

The reason for taking out a patent is to protect your invention. If someone doesn't respect this right, prosecution is in order. Orange[22] estimates the cost of litigation to be 2-4 million dollars on each side. Again, well out of the budget of all but the largest of companies.

Of course, the cost of protecting patents does not only burden the patent holder. Any party who comes up with an invention, which happens to be similar to one previously patented, is liable for prosecution. Even if they win the case, they still lose the time and money vested in fighting the litigation. This problem is amplified by the fact that searching patent databases is non-trivial and expensive, and is not guaranteed to succeed.

#### 2.5.4 Bogus patents - Novelty?

Another big problem with patents is the issue of bogus patents. The US patents office is particularly notorious for this practice.

The issue of obvious software patents is well publicised, and examples of them can be readily obtained. US patent application DN/20030005058 is a fine example of this. This patent application is attempting to obtain a patent on the idea that after you press "Send" in your email program, you should get a "confirmation dialog box" asking you to confirm that you really want to send the mail to everyone on the To: and CC: lines. Other well known obvious software patents include Amazon's one-click patent, and Microsoft's double click patent.

The patenting of the obvious isn't only limited to software. In 2001, a team of Australian inventors successfully patented a "Circular Transportation Facilitation Device" (AU - 2001100012), more commonly known as a wheel.

#### 2.5.5 Bogus patents - Usefulness?

Novelty is not the only thing certain patent applications lack. Many designs patented can be best described as mere flights of fancy, as they are un-implementable. Again, this issue is well known when it comes to software patents on certain algorithms, but hardware patents are certainly not free from this practice. The following:

- Johnson, Howard R., US4151431 "Permanent Magnet Motor", April 24, 1979
- Baker, Daniel, US4074153 "Magnetic propulsion device", February 14, 1978
- Hartman; Emil T., US4215330 "Permanent magnet propulsion system", December 20, 1977 (this device is related to the Simple Magnetic Overunity Toy (SMOT))

are all patents for perpetual motion machines.

Because employees at patent offices cannot possibly be acquainted with all inventions ever made, the problem of issuing patents for impossible, or well known, widely used, public domain inventions are inevitable. This not only does not encourage innovation, but suppresses it, for fear of litigation.

### 2.5.6 Evergreening and monopolising the market place

Proponents of patents claim that patenting is the interest of the consumer. The problem with patenting ideas, and not just tangible products is that it stifles the innovation of actual products, for fear of litigation.

By obtaining a patent, the holder effectively gets an exclusive right, or a monopoly, on an idea. This stops competitors from developing competing products, or improving on the product in question.

By reducing competition, consumers lose, as prices are set by the patent holder. A problem that's prevalent practice in pharmaceutical companies, but not exclusive to them, is evergreening. Evergreening is the practice of extending patents by making trivial changes in the invention, thereby maintaining the market monopoly.

## 3 Patent Laws in the United States

In this section various laws pertaining to patents in the US is be discussed.

### 3.1 The United States Patent and Trademark Office

The United States Patent and Trademark office (USPTO) is the US government entity responsible for granting patents. The USPTO is a part of the U.S. Department of Commerce, and advises the US President, the US Secretary of Commerce, and other US government agencies about domestic and global IP issues. It is responsible for the preservation and classification of patent information.

US law establishes the USPTO as the administrator of laws relating to patents, and specifies the subject matters for which patents can be obtained, and the conditions of patentability. Some of these laws are discussed in the following sections:

### 3.2 US Patent Laws

As mentioned before, patent laws are enshrined in the United States constitution, and the first patent law was enacted in 1790. On 19 July 1952 a general revision of patent laws were enacted, and came into effect in 1953. This act is codified in Title 35 of the United State Code.

In 1999, the US Congress enacted the American Inventors Protection Act (AIPA), further revising patent laws.

### 3.3 What Can Be Patented

Anyone who invents or discovers any new and useful process, machine, of matter, or any new and useful improvement thereof, may obtain a patent.

The law defines a process as a process, act or method, and usually refers to industry or technical processes.

The Atomic Energy Act of 1954 excludes the patenting of inventions useful solely in the utilisation of special nuclear material or atomic energy for atomic weapons.

Patents are only granted upon a new machine, manufacture, or process, and not upon a mere idea of a new machine, in other words, a complete description of the actual machine or other subject matter for which the patent is sought is required.

Another important restriction on the grant of patents is usefulness. This means that the subject matter must be operative, and serve its intended purpose.

### 3.4 Conditions for obtaining a patent

The main conditions for the grant of a patent in the US are:

- Novelty
- Non-obviousness

Novelty is defined in patent law as something that wasn't known or used by anyone in the US, or patented or described in a publication in a foreign country, before the invention by the applicant, and, the invention has not been in use, or been published, for more than one year before the date of the application in the United States.

The applicant has a maximum of two years to lodge a patent application from the time of the invention.

If the differences between the work and prior art are obvious, the patent can be refused.

### 3.5 Who May Apply For A Patent?

Only the inventor can apply for a patent, with the following exceptions:

- The inventor is dead – the application can be made by the administrator or executor of the estate.
- The inventor is insane – the application can be made by a guardian.
- The inventor refuses to apply or is missing – a joint inventor, or a person having proprietary interest in the invention may apply.

### 3.6 What does applying for a patent entail?

In order to apply for a patent, one must lodge a written application to the US patent office.

#### 3.6.1 What a patent application looks like

A non-provisional application for a patent is made to the Commissioner for Patents and includes [15]:

1. A written document which comprises a specification (description and claims), and an oath or declaration;
  - This must be written in English, must be typed, and must be presented on smooth, non-shiny white paper, to aid copying
  - It must conclude with a claim or claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as the invention. This dictates the scope of what is covered by the patent.
  - More than one claim may be presented, so long as they differ from each other.
2. A drawing in those cases in which a drawing is necessary; and
3. The filing fee. Applicant must determine that small entity status is appropriate before making an assertion of entitlement to small entity status and paying a small entity fee. Fees change each October.

The various parts of the application need not be submitted together, but doing so is preferable. The application isn't forwarded for examination and processing until all parts are received.

### 3.6.2 How long does it take to process?

In the US, patent applications usually take between 1 and 3 years to process, after being filed. Sometimes interference can prolong this process.

Interference is when two or more patent applications are filed by different inventors claim substantially similar patentable material within a period of a year. The patent can only be granted to one of them. Typical losses arising from interference are three to four million dollars, and about 1% of patent applications are subject to interference.

### 3.6.3 How much does it cost?

The actual cost of obtaining a patent runs far higher than just the cost of applying for one. A patent for a fairly simple invention, providing narrow protection costs around \$5,000, whereas one for a more complicated invention or one that offers broader protection can cost well over \$30,000.

As only about 3% of patents issued actually make any money for the inventor, and only about 10% of patents ever make it to the market, this cost is a substantial investment.

In order to apply for a patent, one must first lodge an application. For an independent inventor, lodging an application at the USPTO costs about \$395. If it is granted, an issuance fee of \$600 is charged.

Patent applications usually take 1-3 years to process from the date of application. Once a patent is issued, it provides 20 years of "patent protection" for the inventor, however, the inventor must pay maintenance fees. 3.5 years after the patent is issued, \$525 must be paid, at 7.5 years, another \$1,050 is due. After 11 years a final payment of \$1,580 goes to the patent office. This totals to about \$4,150 in total just for the application and maintenance fees.

In order to apply for a patent, one must hire a patent attorney to instigate a search. Hiring one can cost tens of thousands of dollars, and is separate from the application fees due at the USPTO. Even once a patent is issued, the USPTO does nothing to defend it. If a dispute arises, the inventor is responsible for the legal fees associ-

ated with litigation and the hire of legal staff.

Large corporations have to pay about double that of independent inventors for lodging and maintaining patent applications.

### 3.7 Contentious Issues with patents in the US

Not everyone thinks patents are a good idea. In the following sections some arguments against the US patent system in particular are presented.

#### 3.7.1 Erroneous Acceptance of Patent Applications

The US patent office processes thousands of patents a year, many of which are neither novel nor practical. This creates many problems, as litigation and profiteering over meaningless patents abounds.

Part of the reason for this problem lies in the fact that patent office employees are not qualified to judge the novelty or usefulness of a proposed patent, in many cases. Due to the sheer number of applications, they can't really investigate each and every one in great detail either.

A proposal given by Jaff and Lerner [7] in their book due for publication soon, *Innovation and Its Discontents: How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do about It*, envisages that most patents would only be given a cursory examination, given they are probably "economically unimportant". In other words, patents like 6,701,872– "a method and apparatus for automatically exercising a curious animal" which is unlikely to be contested by another inventor shouldn't take up much time for examination. Instead, this time should be spent on more contentious patents, in order to properly evaluate prior work, and judge novelty and usefulness.

Of course, even if the above procedure is instituted, bad patents will still be granted, as patent laws currently strongly favour the patent holder. The law presumes the patent is valid, and places the onus on the plaintiff to present "clear and convincing" evidence that an error has been made by the examiners. The requirement of trial by jury exasperates this problem, as jurors are often even less qualified than examiners in grasping the intricacies of the technology, and often don't understand patent law either. Having trials heard by qualified judges, and not juries would go far in reducing the bias against plaintiffs in such trials, and providing a means of questioning the validity of bogus patents.



### 3.7.2 Submarine Patents

A contentious issue in the US patent system is that of submarine patents. The US system allows lodgment patent applications, without disclosing the nature of the invention publicly.

These patents sit idle until the technology to implement the ideas becomes available, and slowly grow in scope. When someone implements the idea, the person who lodged the patent promptly sues the actual inventor for patent infringement.

A prominent example of the effects of this practice is illustrated by the Lemelson group law suit [5].

Lemeson lodged many patents in his lifetime, his 550 puts him close behind Thomas Edison. The companies suing Lemelson claim that by taking advantage of the system, he continually delayed the issuance of a patent. This kept the details of the patent secret, giving him time to broaden its scope to encompass technologies invented and sold by others.

One of such patents, covering bar-code scanning, surfaced no less than 40 years after being filed. After its issue, Lemeson asked for licensing fees from thousands of companies utilising this technology, and sued them if they refused to pay. Some estimates claim that he generated \$1.5 billion US dollars by pursuing this strategy.

Although the Lemeson institution disputes the claim that its founder was a submarine patenter, and claims he was a victim of delays at the patent office, if won this case could undermine lawsuits brought by the foundation against over 400 others.

Recently the patent office has made 40 year delays impossible, by making the total time of protection 20 years, including the non-disclosure period. This means that companies have far less incentive to not disclose their method.

### 3.7.3 Defending Patents

Since a patent is like any other property, the cost and responsibility of defending it falls upon the owner. This means that to search and spot violations, to force the payment of licensing fees, and failing that, to litigate, the owner must pay for the cost of enforcing the law.

Extensive searches are expensive, and litigation is also expensive, putting defending a patent only in the means of large corporations. Litigation is also often futile, costing both parties in the order of millions, and preventing the defendant from

doing business. Another case where the only winners are the lawyers.

## 4 Patents Around the World

In the last few years, great effort has been put into unifying patent and intellectual property laws around the globe, and codifying IP ownership laws into the constitutions of developing nations.

Two major organisations pushing this effort are the World Trade Organisation (WTO) and the World Intellectual Property Organisation (WIPO). These organisations hold biannual negotiation talks, and organise the signature of treaties between different nations, as well as promote the importance of IP legislature through education programs, particularly ones aimed at children. [?].

### 4.0.4 World Intellectual Property Organisation

With headquarters in Geneva, Switzerland, WIPO is one of the 16 specialised agencies of the United Nations system of organisations. It administers 23 international treaties dealing with different aspects of intellectual property protection. The Organisation counts 181 nations as member states.

The WIPO program states two main aims:

1. to promote the protection of intellectual property throughout the world through cooperation among States and, where appropriate, in collaboration with any other international organisation,
2. to ensure administrative cooperation among the Unions.'

In other words, WIPO aims to promote the importance of IP throughout the world, and organise a framework of legislature to protect IP rights. In conjunction with the governments of member states, WIPO negotiates the integration of IP laws into the socio-economic policies, and aims to increase the benefactories of IP protection.

### 4.0.5 World Trade Organisation and TRIPS

With the increasing ease of communication, and the far freer flow of knowledge between entities across borders, the World Trade organisation takes a keen interest

in Intellectual Property rights and laws.

One of the key agreements is TRIPS, the Trade-Related Aspects of Intellectual Property Rights. The TRIPS agreement covers several areas of IP rights, including copyright and related rights, trademarks and service marks, geographical indications including appellations of origin, industrial designs, patents (including plant patents), layout and design of integrated circuits, and undisclosed information like trade secrets and test data.

Notwithstanding the three exceptions to this rule, TRIPS member countries are to make patents available, without discrimination, to any invention subject to the normal tests of novelty, inventiveness and industrial applicability.

The three exceptions to this rule are:

1. Inventions contrary to ordre public or morality includes inventions dangerous to human, animal or plant life or seriously prejudicial to the environment. This condition can only be used when the commercial use of the invention is also prohibited, for the protection of public ordre or morality.
2. Diagnostic, therapeutic and surgical methods for the treatment of humans or animals.
3. The third is that Members may exclude plants and animals other than micro-organisms and essentially biological processes for the production of plants or animals other than non-biological and micro-biological processes. However, any country excluding plant varieties from patent protection must provide an effective sui generis system of protection. Moreover, the whole provision is subject to review four years after entry into force of the Agreement. [18].

The rights that must be conferred to a patent holder are fairly similar to those given to patent holders in the United States. These include exclusive rights to make, use, offer for sale, sell, and import the product. For processes this protection gives the right to not only use the process, but also rights over products directly derived from the process. Patent rights are no different from physical property rights, as the holder must have the right to assign, transfer, and to conclude licensing agreements.

As in the US, the term of the patent is a minimum of 20 years from the date of filing, and again, as in the US, the applicant must be required to disclose the invention in a clear and complete manner.

Member states may provide limited exceptions to the rules outlined above, providing that such exceptions don't conflict with the normal rights of the patent holder.

Compulsory licensing and government use is allowed, so long as the legitimate rights of the holder are protected.

In TRIPS there seems to be a big emphasis on protecting the rights of the patent holder above all else, and extending such rights as much as possible. The agreement forbids, or at least, strongly discourages member nations to reduce the rights of patent holders.

## 5 A Cross-Country Comparison

### 5.1 Major differences between patent laws in the US and other countries

With agreements like TRIPS, and the advent of WIPO, patent laws around the world are becoming increasingly uniform. One of the main differences between the US and other systems remains in deciding who can obtain a patent.

The US system, unlike most others, uses a “first to invent” rule. This means that if inventors can establish that they came up with an idea first, they can still file a patent later, or contest one already granted. In most other countries, a “first to file” system is used instead. Proving one is the first person to invent something is far harder than proving one is the first to file for a patent. This increases both the legal fees, and the delays associated with filing patents. In order to meet the first to invent requirement, and minimise the difficulty of proving it, inventors often keep a detailed log of their work, and prepare signed and witnessed disclosure documents as they continue their work.

Another difficulty with the first to invent system is that an inventor has no real way of knowing whether her invention is in fact, novel. In countries with a first to file system, one can theoretically do a full patent search, and if there’s nothing found, can file a patent. In the US however, another person could dispute a patent on the grounds that they came up with the idea first.

Another difference is the more lax requirement of novelty in the US. Most countries require absolute novelty, meaning that if an idea has been published in any form prior to filing, a patent can not be granted. The US however, allows a one year grace period before filing a patent. This means that while someone may be unable to file a patent in her home country, she can file a patent in the US.

In the following sections we discuss patents in Australia, the European Union and in China in greater detail, providing a comparison with the US system.

## 5.2 Patents in Australia

In his paper, Gordon [3] does an overview of the costs and benefits of the patent system in Australia. Here Gordon asserts that patents are a hindrance to Engineers, as most Engineers don't use them as a source of technical information, and the ones who do, don't rate them as important.

His summary of the 1982 report into Australia's patent system states that while patents can have some benefit to the small inventor, they aren't an important determinant of domestic R&D activity.

The main benefactors of the patent system are large, overseas companies, and the patent system plays a subtle role in increasing investment expectations and the transfer of technology to Australia. Domestic firms holding patents report returns from them, but these returns wouldn't be significantly different in the absence of a patents system.

Although patents have some benefits, the negative effects seem to be far higher. Resources that would be better utilised doing actual R&D are often diverted into patent compliance costs. The licensing practices patents protect dampen the already minute local R&D effort and patent monopolies increase prices for both consumers and industry. Patents have been likened to tariffs. The main use of the system by research institutions and Engineers seems to be patent system orientated, as in, for patenting and checking on infringements. The utilitarian purpose of patents being a way to share information isn't utilised.

The Australian government recently signed a Free Trade agreement with the United States. Details of the FTA, and its implications are discussed in the following section:

### 5.2.1 Australia and the Free Trade Agreement

Australia and the United States have traditionally had very close trade and diplomatic ties. With the signing of the FTA, Australian citizens are bound by many US intellectual property laws and this has interesting implications for all Australians.

Article 17 of the FTA is about intellectual property, and part 9 is about patents. [14] This document is strongly reminiscent of the TRIPS agreement, and indeed, does bring Australia in line with TRIPS.

In particular Australia will make patents available for "any invention, whether product or process, in all fields of technology, provided that the invention is new,

involves an inventive step, and is capable of industrial application". (Article 17.9(1)).

Another interesting change is that in Article 17.9(15) "Each Party shall endeavour to establish a cooperative framework between their respective patent offices as a basis for progress towards the mutual exploitation of search and examination work". This could have interesting interpretations, does it imply outsourcing patent examinations?

The FTA's provision on statutory damages is also note-worthy. Statutory damages are damages that are fixed at a figure. Instead of showing how much damage they've actually suffered, the IP owner is given an option to choose statutory damages. In the US IP owners can elect a statutory damage between \$750 and \$30,000 per infringement. Although Australia hasn't actually elected to introduce statutory damages, under article 17.10.7, we have two choices. We can either introduce statutory damages, or a system of additional damages ... provided that if such damages, while available, are not regularly awarded in proceedings involving deliberate acts of infringement ... that Party shall promptly ensure that such awards are regularly made or establish a system of pre-established damages...". so, in other words, if our (independent) judiciary don't "regularly" award additional damages under s115(4) of the Copyright Act, the government has to step in.

### 5.3 The European Patent office

European Patent Office EPC [2] is the European Patent Office. It offers a way to file a single patent application which can lead to patent coverage in all the 28 European countries that belong to it. Some of these countries are Austria, Belgium, Switzerland, Germany, Denmark, Spain, France, United Kingdom, Greece, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, Netherlands, Portugal, and Sweden.

The inventor might choose to file directly with the country or countries in Europe in they think the patent is needed. Or they can apply through EPC which provides an easier solution and is of less cost.

The patent law is different in every nation. The patent system in Europe are comparatively similar. The most influential states in Europe are UK, France, Germany and Italy.

A further difference between the US Patent System and the European Patent System is that there is no provisional application in Europe. In the United States one may file a provisional application which allows the applicant to establish an early effective filing date for a later non-provisional patent application. The provisional application is pending for 12 months and will become abandoned if no non-provisional application corresponding to the from date is filed later.

## 5.4 Patents in China

Being the world's most populous country, and having one of the world's largest economies, China's position on patents affects many aspects of world trade.

China has far more conservative patent policies than capitalist countries. Obtaining a Chinese patent is far more difficult, as the application must go through many different levels of government, and government departments.

If an employee makes an invention while at work in China, the employer has a right to patent it. Any job related inventions made by employees in foreign owned enterprises or Sino-foreign equity joint ventures also belong to the enterprise, or joint venture. [1]

Unlike the US, and the TRIPS agreement, if an invention was made by more than one person or entity, the person who applies first gets the right to own the patent. The other entity or entities may not join the patent later.

Patents in China grant the additional right of granting the right to control imports of the product or process into the country. Most other patent systems don't explicitly have this right enshrined.

In China, the person who applies for a patent must be alive and mentally competent, before patent rights are granted. No such condition applies in the United States. Unlike the US, where the only person who can apply for a patent is the inventor, in China a foreign national or foreign enterprise can entrust the patent agency designated by the state council to act on its behalf.

The Chinese government has the power to control what's patented. If a patent is of great significance to the State or to the public, the applicant must obtain permission from the related department. The government can also permit designated entities to exploit important patents held by state-owned entities. The entities exploiting such patents shall, in accordance with state provisions pay an exploitation fee to the entity holding the patent right.

## 6 Some Case Studies

### 6.1 Case Study 1 – The Inventor of Television

Television is a classic case where the inventor is ambiguous because two or more people were working on the same idea at the same time, but in different places.

Vladimir Kosma Zworykin, a Russian-born American inventor working for Westinghouse, and Philo Taylor Farnsworth, a privately backed farm boy from the state of Utah.

Zworykin is usually credited as being the father of modern television because he owned the patent for the heart of the modern TV. He invented the electron scanning tube, and patented it in 1923 under the name of an iconoscope.

Farnsworth however, was the first of the two inventors to successfully demonstrate the transmission of television signals, in 1927 using a scanning tube of his own design. Farnsworth received the patent for the electron scanning tube in 1930, after demonstrating the transmission of television signals in 1927.

Zworykin was unable to duplicate Farnsworth's efforts until 1934. In this sense, although Zworykin came up with the idea first, Farnsworth's invention was far more useful. [17, 9]

### 6.2 Case Study 2 – Endoscopic Surgery

In 1998, Ethicon alleged that competitor US Surgical Corp infringed two claims of an Ethicon patent for manufacturing and selling the "safety trocar".

U.S. Surgical found that one electronic technician named Mr. Choi who worked on the safety trocar project but was not named as a co-inventor. While the suit was pending in district court. U.S. Surgical then purchased from Mr. Choi a retroactive license to manufacture the trocar. Mr. Choi also agreed to assist in any legal proceedings relating thereto.

The district court found that Mr. Choi had, indeed, contributed to two of the 55 claims of the Ethicon patent even though his contribution was very little. Thus he be added as a named inventor and U.S. Surgical won the case. [21]

This illustrates the case where more than one inventor was involved in the invention. US law requires that all inventors who worked on a project be named on the



patent, no matter how little their contribution is.

### 6.3 Case Study 3 – Electronic Multi-function Card

In 1994 *E-Pass Technologies* filed a patent for an electronic multi-function card. The object of U.S. Patent No. 5,276,311 was to provide a method and device for substituting a single electronic multi-function card for multiple credit cards. [4, 6]

The abstract of the patent describes the invention as a credit card sized device holding distinct data sets representing individual single purpose credit cards, as well as display devices for use for electronic activation.

E-Pass filed a suit against *Palm Inc.* in February 2000 alleging that Palm infringed their multi-purpose credit card patent, since the E-pass patent is not limited to credit card sized devices. The Californian District court ruled in favour of E-Pass, and the Federal Circuit further held that Palm sized PDAs could literally, as well as under the doctrine of equivalents, infringe on E-pass's patent.

E-Pass has since launched similar litigation against Microsoft and Compaq (now HP). Since the patent has been vindicated by the Federal Circuit, it's expected that E-Pass will launch further litigation against makers of hand-held devices.

This is a good example of a patent being far too broadly specified, and covering products which the inventor did not in fact invent. Such patents cause unnecessary litigation, and punish actual inventors.

## 7 Conclusion

Patents were originally intended to protect the interest of the inventor, to make an invention a concrete property, by granting a monopoly over the marketplace for a fixed amount of time.

By giving concrete value to an invention, intellectual property laws aim to open up fields of knowledge, and give intellectuals, inventors, and developers an incentive to produce new works.

As we have seen in this essay, the patent system, as in now stands in the US and in Australia, is often abused, and does little to serve inventors.

Major flaws in the patent system, have been discussed, and include:

- Exuberant costs of obtaining patents
- Lodgment and issuance of bogus patents
- Litigation arising from bogus patents, or patents that are too broadly specified
- Problems associated with searching patent databases
- Lack of utilisation of patented knowledge by academics and inventors
- Abuse of patent systems by large corporations to the detriment of consumers and small inventors
- The fundamental problem of two or more people working on the same idea simultaneously, yet independently
- The cost of enforcing patents

Most of the problems were discussed using the system in the United States as an example, however, with the advent of the FTA, Australians are subject to the same issues as their US counterparts. Furthermore, with organisations like WIPO and the World Trade Organisation actively perusing the uniformisation of patent laws across the globe, patent issues will affect every body.

Most people agree that the pursuit of knowledge is a worthy aim, and those who invent new things, come up with new ideas, and produce works of art should be duly rewarded for their work. Inasmuch, intellectual property laws are fundamentally a good idea. We have however demonstrated in this essay, that fundamental flaws exist in the current system of patents, and IP laws in general. Although abolishing the system as a whole is probably no answer to the problems, genuine reforms must be made to the patent and IP system before they truly benefit those who they were originally intended to. Inventors and intellectuals.

Until then, the main beneficiaries of IP laws will be lawyers, and the large companies that employ them. As scientists and Engineers, we will probably face patent issues in our careers, and there is little we can do to avoid them. As such, we should be informed of our rights and responsibilities with respect to intellectual property, and actively seek to improve laws governing IP issues.

## References

- [1] Chinese patent law – [http://www.novexc.cn/patent\\_law\\_92.html](http://www.novexc.cn/patent_law_92.html).
- [2] Convention on the grant of european patents (european patent convention) – <http://www.european-patent-office.org/legal/epc/e/ma1.html#CVN>.
- [3] Cost analysis of patents in australia – <http://lpf.ai.mit.edu/Patents/papers/historical-overview-gordon>.
- [4] Court rules e-pass handheld patent suit can resume – [http://www.palminfocenter.com/view\\_story.asp?ID=5844](http://www.palminfocenter.com/view_story.asp?ID=5844).
- [5] Deep-sixing the submarine patent – <http://www.sciam.com/article.cfm?articleID=000C4F59-8093-1D2B-97CA809EC%588EEDF>.
- [6] Federal circuit hands palm a setback, brenda sandburg – <http://www.law.com/jsp/article.jsp?id=1061487920604>.
- [7] If it's broke, fix it. – <http://www.sciam.com/article.cfm?articleID=000BA312-7845-10CF-B4F283414%B7F0000>.
- [8] Ip ethics – <http://arstechnica.com/wankerdesk/01q3/ip-ethics/ip-ethics-1.html>.
- [9] Mzstv museum of television – <http://www.mzstv.com/newframe.asp?content=http://www.mzstv.com/pioneers.h%tml>.
- [10] nrcan glossary – [www.nrcan.gc.ca/cfs-scf/science/prodserv/kmglossary\\_e.html](http://www.nrcan.gc.ca/cfs-scf/science/prodserv/kmglossary_e.html).
- [11] Skyrocketing method patents stifling innovation, say critics – [http://www.usatoday.com/tech/news/techpolicy/2003-07-28-patents\\\_x.htm](http://www.usatoday.com/tech/news/techpolicy/2003-07-28-patents\_x.htm).
- [12] Uk patent office history – <http://www.patent.gov.uk/patent/whatis/fivehundred/>.
- [13] The united states constitution – <http://www.house.gov/Constitution/Constitution.html>.
- [14] Us – australia free trade agreement – [http://www.dfat.gov.au/trade/negotiations/us\\_fta/final-text/chapter\\_17.%html](http://www.dfat.gov.au/trade/negotiations/us_fta/final-text/chapter_17.%html).
- [15] Us patent office website – <http://www.uspto.gov/>.
- [16] Uspto fee schedule (2005) – <http://www.uspto.gov/go/fees/fee2004oct1.htm>.

- [17] Who is the inventor of television? – <http://www.physlink.com/Education/AskExperts/ae408.cfm>.
- [18] World trade organisation, trips agreement – [http://www.wto.org/english/tratop\\_e/trips\\_e/intel2\\_e.htm](http://www.wto.org/english/tratop_e/trips_e/intel2_e.htm).
- [19] *Webster's Revised Unabridged Dictionary*. 1913.
- [20] FITZGERALD, A. *Intellectual property*, 1999.
- [21] KURT W. LOCKWOOD, J. B. M. What you claim is what you get – <http://www.tht.com/Pubs/pdfs/IP\%20beserverSummer2001.pdf>.
- [22] ORANGE, J. R. S. The cost of patents, an issue for whom? – [http://www.invention-ifa.ch/Costs\\\_orange.pdf](http://www.invention-ifa.ch/Costs\_orange.pdf).