

# Patent Wars and Innovation in Technology

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**Abstract.** The industry of technology is being crippled by a number of large litigation processes, all of which have a direct negative effect in modern markets' primary trait: competition, and indirectly attack technology at its core: innovation. Through case analysis and background checking, this document arrives to the conclusion that the root of such a dreadful landscape in the industry of technology is the direct result of a flawed patent system and the legal network that supports it.

**Key words:** patent, technology, innovation, infringement

## 1 Introduction

A patent is an exclusive set of rights issued by governments to the person who invents a new object. These rights contemplate mainly the object's right to be manufactured, sold and/or reproduced. In order for a new object or invention to be the subject of a patent, it must meet certain conditions, such as being original, non-obvious and be applicable in a relevant industry.

Legal systems all over the world today serve as the basis under which everything regarding patents is defined and controlled, such as the criteria for patentability, the process an invention must go through before its patent is released, and the consequences which result from the breaking of these laws. It is this latter point which is the main focus of this work. At the time of this writing, there exists a legal battle between large technological companies, the object of which is patent infringement.

It is the purpose of this document to show that while patent systems promote industrial innovation in several fields, such as the one of pharmaceutical drugs, and are thus accomplishing its original goal, there are other fields, such as the one pertaining to software development, where patent systems rather than encouraging innovation, are hindering it.

Also, while most of the countries in the world today have a patent system, this work will be focusing mainly on those affected by the aforementioned legal battle between the involved parties. The one in the United States of America is of particular interest due to its large influence in other countries, as well as its

ties with other large patent systems, such as the one in Japan and the European Union. Moreover, this current legal battle is used mainly as an example of the negative effect which might be associated with a patent system, which admittedly, does not pertain solely to this area.

### 1.1 Basic Terminology

In order to better understand the basic concepts regarding patent systems, a number of basic terms and their definitions are provided, as taken from the american website *www.law.com*. The acquainted reader may wish to skip this section altogether.

1. **Patent:** an exclusive right to the benefits of an invention or improvement granted by the U.S. Patent Office, for a specific period of time, on the basis that it is novel (not previously known or described in a publication), "non-obvious" (a form which anyone in the field of expertise could identify), and useful. There are three types of patents: a) "utility patent" which includes a process, a machine (mechanism with moving parts), manufactured products, and compounds or mixtures (such as chemical formulas); b) "design patent" which is a new, original and ornamental design for a manufactured article; and c) "plant patent" which is a new variety of a cultivated asexually reproduced plant. Example: Secretary of Agriculture and later Vice President Henry A. Wallace developed hybrid corn which made him rich for life. A utility or plant patent lasts 17 years and a design patent lasts 14 years, but all types require payment of "maintenance" fees payable beginning 3 1/2 years after the issuance to keep them up. Patent law specialists can make a search of patents to determine if the proposed invention is truly unique, and if apparently so, can file an application, including detailed drawing and specifications. While awaiting issuance of the patent, products or designs should be marked "patent pending" or "pat. pending." Upon receiving the patent the product can be marked with the word "patent" and the number designated by the Patent Office. The rights can be transferred provided the assignment is signed and notarized to create a record or "licensed" for use. Manufacture of a product upon which there is an existing patent is "patent infringement" which can result in a lawsuit against the infringer with substantial damages granted. [2]
2. **License:** a private grant of the right to use some intellectual property such as a patent or musical composition. [3]
3. **Copyright:** the exclusive right of the author or creator of a literary or artistic property (such as a book, movie or musical composition) to print, copy, sell, license, distribute, transform to another medium, translate, record or perform or otherwise use (or not use) and to give it to another by will. As soon as a work is created and is in a tangible form (such as writing or taping) the work automatically has federal copyright protection. On any distributed

and/or published work a notice should be affixed stating the word copyright, copy or , with the name of the creator and the date of copyright (which is the year of first publication). The notice should be on the title page or the page immediately following and for graphic arts on a clearly visible or accessible place. A work should be registered with the U.S. Copyright Office by submitting a registration form and two copies of the work with a fee which a) establishes proof of earliest creation and publication, b) is required to file a lawsuit for infringement of copyright, c) if filed within three months of publication, establishes a right to attorneys' fees in an infringement suit. Copyrights cover the following: literary, musical and dramatic works, periodicals, maps, works of art (including models), art reproductions, sculptural works, technical drawings, photographs, prints (including labels), movies and other audiovisual works, computer programs, compilations of works and derivative works, and architectural drawings. Not subject to copyright are short phrases, titles, extemporaneous speeches or live unrecorded performances, common information, government publications, mere ideas, and seditious, obscene, libelous and fraudulent work. For any work created from 1978 to date, a copyright is good for the author's life, plus 50 years, with a few exceptions such as work "for hire" which is owned by the one commissioning the work for a period of 75 years from publication. After that it falls into the public domain. Many, but not all, countries recognize international copyrights under the "Universal Copyright Convention," to which the United States is a party. [4]

4. **Trademark:** a distinctive design, picture, emblem, logo or wording (or combination) affixed to goods for sale to identify the manufacturer as the source of the product. Words that merely name the maker (but without particular lettering) or a generic name for the product are not trademarks. Trademarks may be registered with the U.S. Patent Office to prove use and ownership. Use of another's trademark (or one that is confusingly similar) is infringement and the basis for a lawsuit for damages for unfair competition and/or a petition for an injunction against the use of the infringing trademark. [5]
  
5. **Patent Infringement:** the manufacture and/or use of an invention or improvement for which someone else owns a patent issued by the government, without obtaining permission of the owner of the patent by contract, license or waiver. The infringing party will be liable to the owner of the patent for all profits made from the use of the invention, as well as any harm which can be shown by the inventor, whether the infringement was intentional or not. [6]
  
6. **Patent Ambiguity:** an obvious inconsistency in the language of a written document. [7]

## 2 United States Patent and Trademark Office

The United States patent system was the first in the world to be supported by law. Its roots can be traced back to the year 1790, the year in which George Washington signed the bill that included patents in the American legal system. The first patent office in the United States was founded in the year 1802. Most patent systems in the world today function in a similar way [8].

### 2.1 Patent Process

As stated above in the definition of patent, the United States Patent and Trademark Office, or USPTO, contemplates three kinds of patents: a utility patent, a design patent and a plant patent. Of these three, the first two take part in that which is the focus of this work. The process through which any American citizen may apply for obtaining a patent is best described by the flow chart in **Fig. 1**, as taken from the official website from the United States Patent and Trademark Office.

Said process, as it seems, is not a complicated one. One must determine which kind of patent one wishes to fulfill and the form in which the application will be presented. From there on, it is the USPTO job to examine the application and eventually grant the patent if it is found fitting. This is a long process, one which has accumulated a rather large backlog of patent applications which are yet to be examined. However, it does seem reasonable to think that the examination of whether or not each individual application meets the criteria for patentability is a time-consuming task.

### 2.2 Patentability

Not all industries are subject to patent protection. Industries where it would be very difficult for an invention to meet the patentability criteria are not affected by the patent system. For example, a simple list of instructions placed in a certain order cannot be patented. It is under this category that the food industry falls.

As stated earlier, anything that is too utilitarian or too obvious cannot be patented. Also, whatever is patented must have usability in some industry. **Fig. 2** provides a rough image of the distribution of industries across the field of the patent system.

### 2.3 Software Patents

After having covered the basics of patents and the criteria behind them, some inferences can be made regarding the possible location of proprietary software within **Fig. 2**. As mentioned before, a simple list of instructions placed in a certain order cannot be patented. In the strictest sense of the word, an algorithm

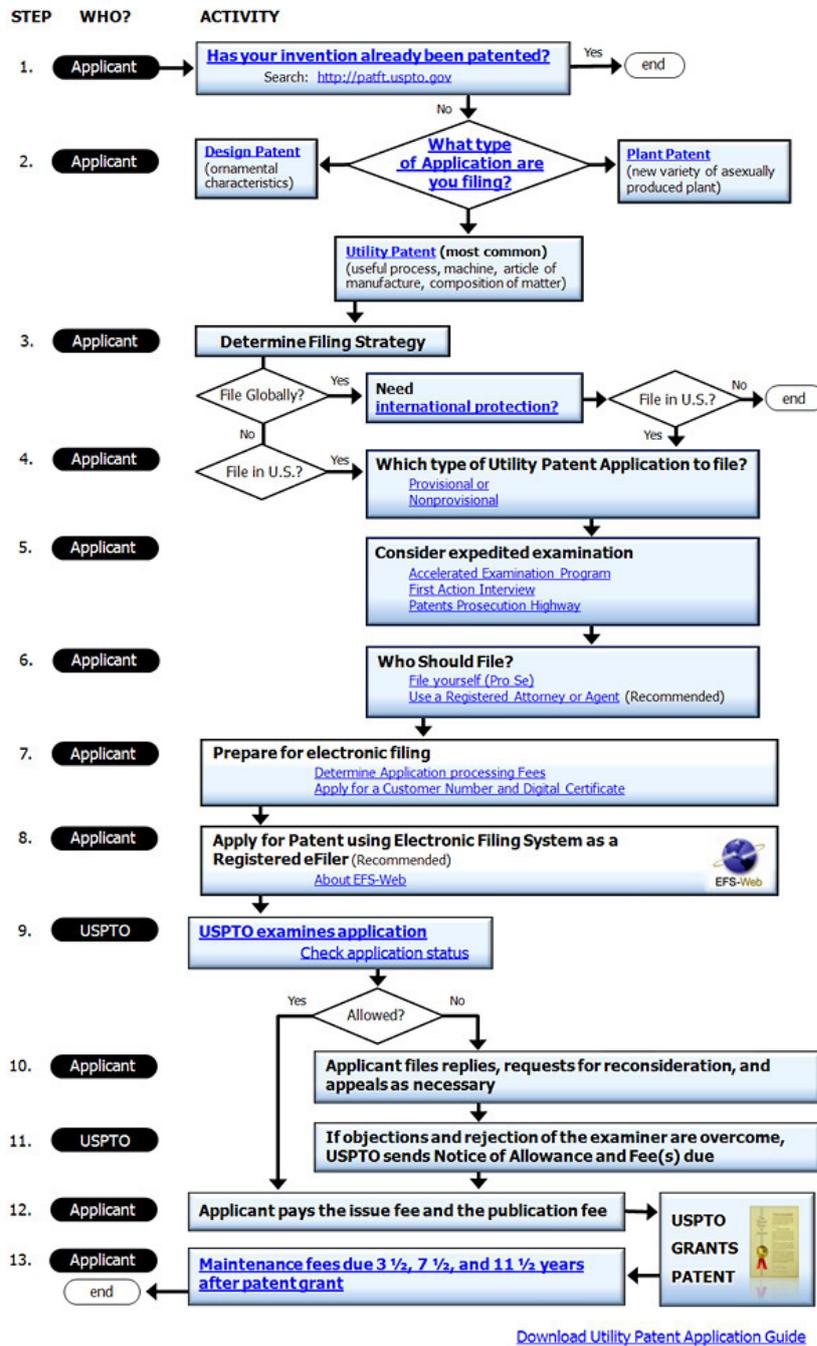


Fig. 1. Flow chart of the patent process in the USPTO. [9]

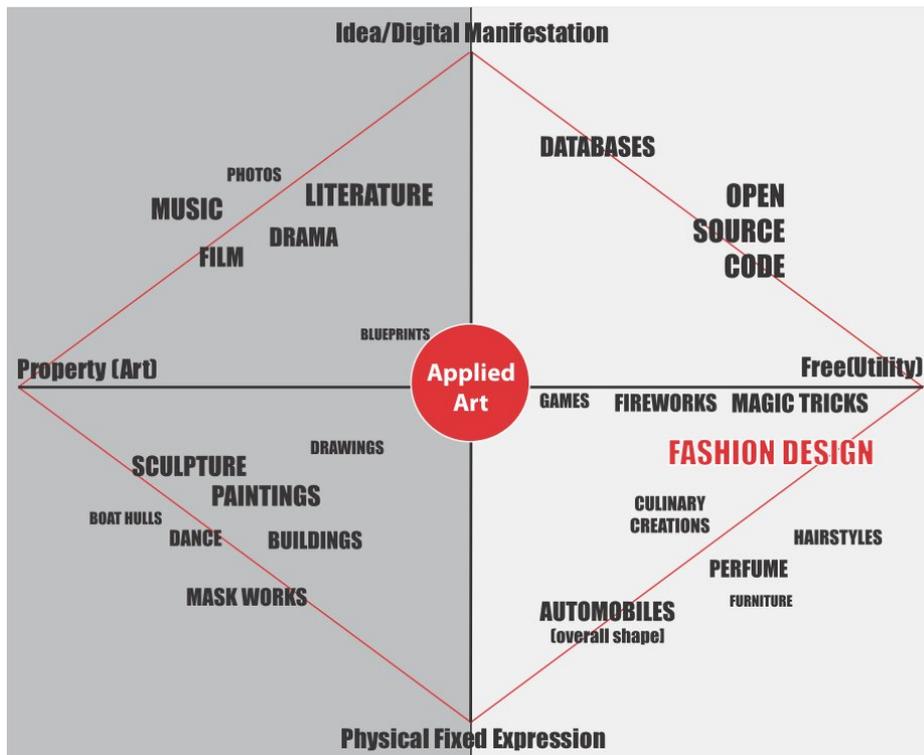


Fig. 2. Industries and the US patent system. [10]

is just that. However, an algorithm has a goal, and several different algorithms can achieve the same goal without following the same set of instructions in the same order.

These are two of the main points which have made software patenting the controversial issue it has been for decades. Several granted patents have been questioned to the point where, at the beginning of the 1990s, a federal court had to step in and solve these conflicts. At this point it had become clear that some new standardization was required and in 1996 the Examination Guidelines for Computer-Related Invention was released by the USPTO [11], after which a large number of patent applications were submitted to the patent office.

What the changes that were made had brought, it seemed, was not solutions, but rather a whole new problem which has a direct negative effect on innovation. Patents have ever since been granted to very broad and general software concepts. Also, these patents had been granted years after these concepts were already in use in their respective industries. All of these factors gave place to the scenario which is front and center in the industry of technology today.

### 3 Patent Wars

As it stands today, there are several lawsuits underway between large technological companies, and at the core of most of them lies the patent system. The details of these cases are irrelevant to the analysis of the general situation, but it is worth noting that Apple, HTC, Oracle, Samsung and Google are among the major corporations who are currently battling one another. Out of these five companies, three are American companies, all of which are in the top 100 of the Fortune 500 list for 2011 [1]. What these mean is that, not only are these companies large within their industries, they are among the largest companies in the United States and therefore, the world.

How it all began is not quite clear, but what is certain is what gives these companies the leverage to pursue litigation: their patent catalog. What these companies seem to have learned long ago is that it is extremely useful to have in their property a large patent catalog, containing from thousands of patents, to tens of thousands of patents. The extent of the power of such a catalog will be better illustrated by the following factual examples.

#### 3.1 PacketVideo and Spotify

Spotify is an online service which provides its users with streaming of music which can be selected by artist, style or even genre. Subscribers can access the service for free and receive a radio-like experience with advertisement, or for a monthly fee access the entire catalog with no advertisement whatsoever [12]. The service is highly popular in the countries where it is available. In addition,

no other similar service had been available to the public before its foundation in 2008.

PacketVideo on the other hand is a company based in East Texas, US and which has a patent for streaming music and video to mobile devices. PacketVideo and Spotify became aware of each other when, after releasing their service for mobile devices, Spotify became the object of a lawsuit involving patent infringement from PacketVideo [13]. Two are the main points that are to be observed here:

1. Spotify is the owner or a product. PacketVideo does not own a product, but rather the patent for one, a general one at that.
2. Spotify seeks to gain profit from the fees payed by their subscribers. PacketVideo, a company which does not provide a single service, seeks to gain profit by filing a lawsuit against Spotify.

### 3.2 Lodsys

Lodsys is a company which has recently risen to fame by suing several major corporations for patent infringement. Among these are Motorola, Canon, Hewlett Packard and Apple. The latter has recently been temporarily placed as the most valuable company in the stock market [14].

From the information that has been gathered by the National Public Radio organization, it was found that Lodsys, like other companies similar to it, are what is referred to as NPE or Non-Practicing-Entities. What that means is that these companies apparently have no register of having had employees, or a functioning office, ever. They have a registered address, but to an empty building. Moreover, a lot of these NPEs are located in the same place, the east of Texas, a largest of states in the United States of America.

What these companies want is to obtain money from the licensing of their patents, and while this is more than fair, it is the quality of these patents which is the root of the problem. But before we move on to the problem, let us cover one more example.

### 3.3 Intellectual Ventures

Intellectual Ventures is a company which takes the leverage provided by patents to a new extent. This is a company that claims to promote individual inventors and seeks to protect them, so that they may gain profit from their inventions. The method employed by Intellectual Ventures relies on buying the patent from an inventor and then acquiring license for this patent by means of contract or litigation. The latter fashion does take part in this work's subject matter, as can be seen by Intellectual Ventures recent lawsuit to Motorola Mobility. [15]

As a consequence of this, Intellectual Ventures' patent catalog is in constant growth and with it, the power the company has in terms of legal leverage. [16]

This is the leverage that the company uses in order to provide a service of protection, not only to individual investors, but also to companies who are releasing products that might be the subject of a lawsuit due to copyright infringement. The number of companies which fall under this latter category is, as evidenced by the rather generic patents which are at the center of these lawsuits, extremely large.

One more point needs to be made about Intellectual Ventures. It has been noted that Intellectual Ventures has in the past sold patents to the very same NPEs which were later suing companies that might have been benefited by the security service provided by the former.

## 4 The Problem

The very broad patents being granted in the software industry, along with the fact that a lot of these patents were granted long after these services were already established in their respective industries, thus rendering them obvious, make it so that a large patent catalog gives a company a lot of power. This power can be used in any way that the company pleases, and it seems that several uses for said power have been found.

Small non-practicing companies such as the aforementioned PacketVideo or Lodsys use this power to gain profit from larger, more established and fully functioning companies. Larger companies, such as Intellectual Ventures, use this power to provide a service of protection against potential lawsuits involving patent infringement. This protection comes in the simplest of forms. Intellectual Ventures offers any patent from their large catalog to be used to counter sue a company. The larger the catalog, the larger the possibility of finding a broad enough patent to serve said purpose. It must be noted here that since Intellectual Ventures is a company that does not produce anything, it is not vulnerable to a counter lawsuit for patent infringement. This latter is common today in the war of patents, as will be evidenced later in the case studies.

In much the same way, we see today that the battles being waged between large corporations such as Oracle and Google, or HTC and Apple seem to arise from the fact that one of these companies wishes to harm the competition in order to gain advantage over it, and they seem to do so through the use of patents. This leads to large corporations seeking to have large patent catalogs of their own, and so any company with a large number of catalog becomes even more valuable than the value of its patents, because there is competition now for the purchase of patents.

In this regard, it has recently been seen that large companies, such as Microsoft or Google, will buy smaller ones which might be on the verge of financial crisis or simply in search of their next move, such as Nortel or Motorola. The two former have recently bought the two latter for billions of dollars.

What all of this does is simply hinder innovation in the software industry, because patents no longer seem to protect the small inventor (or in this field never have), but rather serve as a weapon of war for large companies. Any small company that wishes to launch a new product is exposed to patent infringement lawsuits, the majority of which are for sums larger than the value of the entire company.

Today, inventors and small companies seem to find it more convenient to hide their invention and keep it to themselves, rather than publishing it, because they simply seek to prevent exposure to such a hostile market where large companies have all the advantages. Their only choice? To trust in the patent system which has created this situation in the first place, or rely on companies such as Intellectual Ventures, which only keep growing by making the market what it is today.

## 5 Case Studies

### 5.1 Nokia vs Apple

The Finnish company Nokia filed a suit against the American company Apple Computers in October 2009 for infringement of ten of its patents. The patents involved dealt with communication and the use of wireless networks, particularly GSM, UTRAN and WiFi, through mobile devices. Nokia argued that Apple must pay for the licensing of these patents which one of Apple's products was using, specifically the iPhone. Nokia also claimed that most of the largest communication companies in the world were already paying for the license of these patents and that Apple had refused to do so. [17]

Two months later, Apple filed a countersuit against Nokia, claiming the latter infringed thirteen of the former's patents. Apple Computers also claimed that they were not committing infringement of Nokia's patents. [18]

This battle has come to an end though, with Nokia emerging a victor. Apple agreed to pay royalties to Nokia for every device sold that infringed upon its patents. [19]

### 5.2 Apple vs HTC

The American company Apple has filed a law suit in March 2010 before the United States District Court and the International Trade Commission against

the taiwanese company HTC for infringement of no less than twenty patents. [20] Most of the patents involved have to do with the way operative systems perform their tasks. Moreover, out of the twenty patents, the oldest granted patent dates back to 1995, while the newest one was granted in 2011. Some of these patents include an object-oriented graphic system, the unlocking of a device by performing gestures on an unlock image and a system and method for managing power conditions within a digital camera device. Out of these three patents, the first one covers most operative systems design of the graphic user interface, since the object oriented programming paradigm is the most widely used and successful programming paradigm today. The second patent, which has been granted to Apple in February of 2011, one month before filing said lawsuit, is broad enough to cover most unlocking mechanism in a touch sensitive interface, even if Apple does not use them in their products. The third one is by far the broadest. It basically covers most of today's digital cameras power managing systems. [21]

No less than two months later, HTC filed a counter lawsuit against Apple for infringement of five patents. Some of these patents deal with power management of smartphones and electronic devices, and having a telephone dialler with a personalized page organization of telephone directory memory. [22]

The patent battle between these two companies is anything but over, with HTC filing two more patent infringement complaints in August and September of 2011. [23] This latter complaint comes from a set of patents which had been acquired by HTC just a few weeks before filing the complaint. This comes to show that there is a group of companies who have joined HTC in the battle against Apple and its forms of competition through litigation. [24] This is hardly surprising, since most of the patents which have been allegedly infringed by HTC have to do with its operative system, which is the Android operative system developed by Google.

### 5.3 Apple vs Samsung

In April 2011 Apple Computers sued the south korean company Samsung for infringing upon Apple's intellectual property by copying the look and feel of Apple's products when designing their own. Apple's products involved in the lawsuit are the iPhone and the iPad. These two products were clearly registered at the International Trade Commission before their release, and in plain sight, Samsung's Galaxy S phone and the Galaxy Tab 10.1 do look very similar, both in the outside as well as on the inside. [25]

Just a few weeks later, the south korean company countersued Apple Computers for infringement of ten of their patents. These involved the reduction of power during data transmissions, 3G technology for reducing errors during data transmissions, and wireless data communication technology. [26]

This battle has had a lot of consequences in the past few months, with Apple being granted an injunction against Samsung in the Netherlands as well as Australia, which has resulted in Samsung not being able to sell their involved products in these countries.[27] [28] Samsung has looked for the banning of Apple's products in other countries as well, for example in France, but there has been no result of these actions as of yet. [29]

Apple has since then also extended their lawsuit to include more of Samsung's products. [30]

In a more recent event, it was announced in September 2011 that Microsoft and Samsung have signed a license deal which allows Samsung to make use of Microsoft's large patent catalog in its war against Apple. [31] Moreover, the American company Verizon has recently publicly expressed their support for Samsung and their entering the United States market. They claim this would only benefit competition and therefore, the industry. [32]

As evidence of the dimension of Microsoft's patent portfolio, it is worth noting that Microsoft is currently one of the companies which is making the most profit from Google's open source operative system Android. Microsoft has had several companies, which make use of this operative system, sign a license agreement which results in Microsoft being paid royalty fees for each device that is sold with said operative system. [33]

Google, from their part, have recently acquired the company Motorola Mobility, which means they now hold in their hands a set of new patents, which can be used in the battle which Apple is, sort of indirectly, leading against the Android operative system. [34]

Finally, it is worth mentioning that both HTC and Samsung have hired the service provided by Intellectual Ventures back in November 2010 in what seemed to be an attempt to prepare for a possible patent war with Apple. [35] [36]

#### 5.4 Cases Overview

There are indeed several more of these cases. Companies such as RIM, Kodak and Canon, as well as several others, have been or are currently involved in litigations due to patent infringement issues. **Fig. 3** shows a graph from Reuters which illustrates the patent battles currently being waged. The aforementioned cases have been chosen among all others due to the size or the importance of the companies involved, as well as the consequences that these cases have had. So let us contemplate the implications of these cases.

Of the three, the case presented by Nokia against Apple does seem to hold water. Nokia pointed to ten strong patent infringements out of the thousands of patents within their portfolio. The case ended up favoring Nokia, as has been

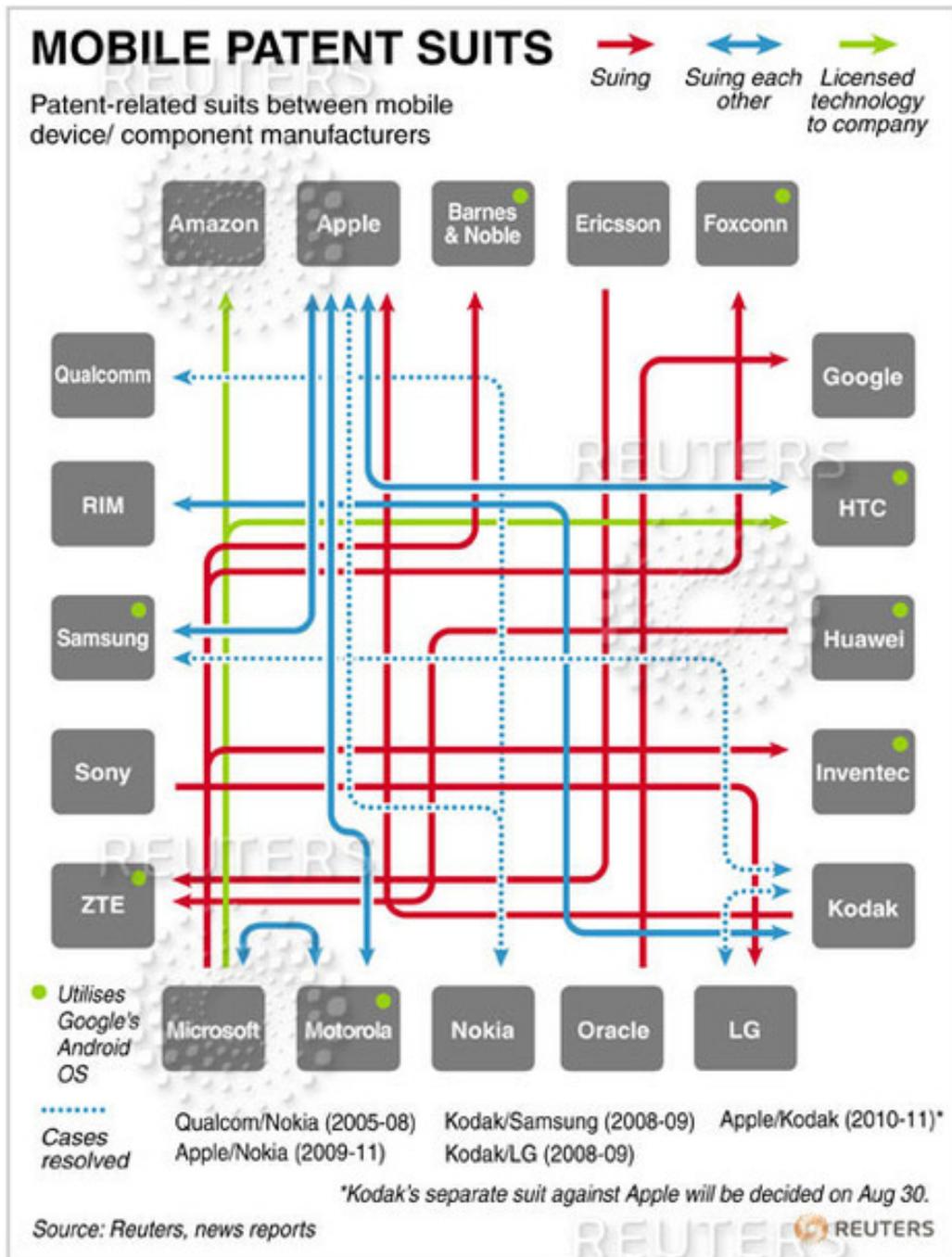


Fig. 3. Flow chart of the patent process in the USPTO. [9]

mentioned, due to their patents being considered essential in the development of today's wireless networks. Of course, one can argue that these ought not to be considered so, but this would mean that the patent system is to blame, as oppose to Nokia's intentions. And while Nokia was only after the licensing fees that they were entitled to, they were at the time in the midst of a losing battle in the market of mobile devices which they themselves had led for years, against Apple's star product, the iPhone. This may indeed be the battle that started the war among the large companies, since it was after this lawsuit that Apple went on to sue HTC.

The case presented by Apple against HTC has been ongoing for over a year. One of the largest companies in the world of technology today, Google, is on the side of HTC. There are twenty patents involved in this case, many of which are very broad indeed. This case seems to point to the fact that Apple does wish to hinder their competitors through legal ways, instead of engaging them in the market of product development, as has been pointed out by HTC. [37]

Finally, one cannot help but acknowledge the strong similarity between Samsung's products involved in the lawsuit and Apple's, particularly in the graphic user interface of the operative system. This case is favoring Apple in more than one country already and one might even say, with due justice.

A question must be asked about all the patents involved though: Should they have been granted in the first place? There are several different kinds of patents among the aforementioned ones. Some seem too broad, such as Apple's patent on power management in camera devices, while some just point out to original ideas, such as Apple's product designs. Regardless, each company that has been sued, has countersued in response, and all countersues also deal with patent infringement. This pattern should only point us back to the origin of the problem: the patent system. To have companies constantly sue and counter sue each other over the same matter cannot be a good sign.

## 6 Possible Solutions

In this section, a number of possible solutions to the problem with the current patent system are presented.

### 6.1 Strict rules and reexamination of patents

A simple and widely suggested solution is simply having very strict rules for granting patents, so that no patent too broad or too late becomes available to anyone. Also, the process of reexamination of a patent as requested by a third party is already functioning in the United States patent system, and the strengthening of this procedures can only be a step towards the solution to this problem.

## 6.2 A patent free industry

Others suggest that the elimination of patents altogether in the industry can serve as an enormous advantage for each participant. As an example, industries such as the Fashion Industry are cited, where no protection for a product exists beyond trademark protection, and yet this industry is among the most profitable industries in the world [10].

## 6.3 Patent Reform in the US

In recent developments, the president of the United States of America, Barack Obama, has passed a new law which serves as a reform to the ill-functioning patent system. Through this reform, the government of the United States is providing the USPTO with the necessary resources to reduce the time that is required to examine a patent application, as well as reducing their current backlog. Also, the reform will benefit the inventor who first applies for a patent, thus eliminating the conflict of deciding who first came up with the invention [38].

## 7 Conclusion

Most of the reasons that drive the problems presented in this work might not be exclusive to the software industry, but what is certain is that the problems are working against the essence of science and technology as a whole: innovation. And while these recent events certainly seem to be a step in the right direction, it remains to be seen whether the patent system will continue to allow such fierce litigation processes and as a consequence, continue to cripple innovation, rather than promoting it, as its original goal states.

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