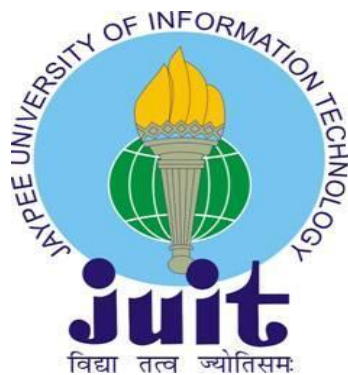


# **PATENT SEARCHING, RETRIEVAL AND ANALYSIS**

Enrollment No. - 142556

Name of the student- Stuti Misra

Name of supervisor- Dr. Gunjan Goel



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**Jaypee University of Information Technology**

**Waknaghat, Solan-173234, Himachal Pradesh**

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## **CERTIFICATE-I**

This is to certify that the project work titled “**Patent Searching, Retrieval and Analysis**” submitted by “**Stuti Misra**” in partial fulfillment for the award of degree of **Master of Technology** in **Biotechnology** from Jaypee University of Information Technology, Solan has been carried out under my supervision. This report has not been submitted partially or wholly to any other University or Institute for the award of this or any other degree or diploma.

**Supervisor:**

**Dr. Gunjan Goel**

Assistant Professor (Senior Grade)

Department of Biotechnology and Bioinformatics

Jaypee University of Information Technology (JUIT)  
Waknaghat, Solan-173234

**Date:**

## **CERTIFICATE-II**

This is to certify that the project work titled “**Patent Searching, Retrieval and Analysis**” submitted by “**Stuti Misra**” in partial fulfillment for the award of degree of **Master of Technology** in **Biotechnology** from Jaypee University of Information Technology, Solan is the result of work carried out by her under my guidance as her Team Lead/Manager (Biotechnology) at Talwar and Talwar Consultants Pvt. Ltd., Mohali.

**Co-Supervisor:**

**Mr. Punit Talwar**

Project Manager/Team Lead

Operations -Biotechnology

Talwar & Talwar Consultants Pvt. Ltd.

Mohali, Punjab

**Date:**

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**Stuti Misra**

**142556**

**Date:**

## COMPANY PROFILE

TT Consultants (ISO 27001 and ISO 9001:2008 certified) is a leading provider of high quality Intellectual Property and Innovation Support Services, helping clients to realize the opportunities and meet challenges. Through the years, they have worked with clients to deliver foremost patent prosecution services and patent litigation support like Invalidity / Validity Searches, Patentability Searches, Patent Drafting etc. They also specialize in Patent Analytics, Technology Transfer and Licensing and other affordable legal support services to corporate, attorneys, law firms, research institutes and universities across the globe.

Their prime focus is to evolve a one-stop platform for a complete patent search technology innovation cycle.

TT Consultants offers a unique combination and consortium of an international patent search firm and an international patent analytics firm from the best professionals across the world. They are among top IP firms in India, providing patent services for the last 8 years to a growing list of satisfied clients all over the globe. In their constant pursuit to innovate, they have been able to successfully induct the many systems and tools aimed at providing enhanced quality solutions to our clients.

### **Their Patent Services include:**

**Prior Art Searches** like Patentability/ State of the Art Search, Patent Invalidation Search, Freedom to Operate Search, Patent Infringement Search, Structure and Sequence searches. Their research includes innovative search reports that come along with a key feature analysis chart and many value additions offered by none other in the industry.

**Patent Analytics** that include Technology Landscape & Whitespace Analysis, Competitor Monitoring, Patent Portfolio Management. They search for, filter and analyze data for clients and present it in a graphical form with clickable dynamic charts for all categories. They identify gaps in a technology area (whitespace analysis) helping clients to direct their R&D efforts.

**Patent Prosecution Services**, handled by their partners Talwar Advocates, includes Patent Filing in India, Office Action Responses, and Trademark Filing/ Search/ Watch. An experienced



team of registered patent agents and other Para Legal staff look over filing of patents and trademarks.

**Innovative Patent Tools** that have been developed in-house by their dedicated experts. Automated Invalidator Tool, Patent Landscape Viewer, Project Allocation System, PAIR Tracking Platform are some of their tools that provide results as exhaustive as a manual search.

# CHAPTER 1

# 1. Introduction

## 1.1 Intellectual Property

The term intellectual property reflects the creation of mind which a person can protect as an intangible property. The subject matter which is referred to as intellectual property is a result of human intellect. Intellectual Property may be protected at law in the same way as any other form of property. Thus, Intellectual property (IP) is a legal concept, which refers to creations of the mind that arose out of a person's intellect and for which exclusive rights are recognized.

## 1.2 Intellectual Property Right (IPR)

These are exclusive set of rights and rules which protect creations of human intelligence and are intangible in nature. IPR are rights granted to creators and owners of works that result from human intellectual creativity for protecting their work from being copied or used by others without permission. These works can be in the industrial, scientific, literary and artistic domains, which can be in the form of invention, a manuscript, a suite of software or business name.

### 1.2.1 Types of IPR

- **Copyright:** Copyright is a legal concept, enacted by most governments, that grants the creator of an original work exclusive rights to its use and distribution, usually for a limited time, with the intention of enabling the creator of intellectual wealth (e.g. the photographer of a photograph or the author of a book) to receive compensation for their work. It provides protection to an author's work (composition/written material) from being copied. Validity of copyright is for the lifetime of authors, plus 50 years after their death.
- **Patent:** A patent is a legal right granted by a sovereign state to an inventor or assignee for a limited period of time in exchange for detailed public disclosure of an invention. A patent right protects the invention which can be novel invention as a solution to a specific technological problem, a product or a process. Validity is for 20 years.
- **Trademark:** A trademark is a recognizable sign, design or expression, which identifies products or services of a particular source from those of others. The trademark owner can be an individual, business organization, or any legal entity. A trademark may be located on a package, a label, and a voucher or on the product itself. In case of corporate identity,

trademarks can also be displayed on company buildings. Trademarks are used to claim exclusive properties of products or services.

- **Geographic Indications:** It is an industrial property right on that good that has a specific geographical origin and possesses its qualities or a reputation attributable to that origin. Eg. Kanchipuram Silk Saree
- **Trade secret:** It is a formula, practice, process, design, instrument, pattern, or compilation of information, which is not generally known, or cannot be assessed and by which a business can obtain an economic advantage over competitors or customers. In some jurisdictions, such secrets are referred to as "confidential information", but are generally not referred to as "classified information" in the United States, since that refers to government secrets protected by a different set of laws and practices. E.g. the coca-cola formula and the colonel's secret blend.



**Fig: 1.1 Different forms of IPR**

### 1.3 Patents

Patent refers to an exclusive right granted to anyone who invents any new, useful and non-obvious process, machine, article of manufacture or composition of matter or any new and useful improvement thereof. It is granted to an invention that may be a product or process that provides a new way of doing things or a better solution to a technical problem. If an invention fulfils the conditions of patentability, it can be protected as a patent. Its validity is for 20 years from the date of filing of the patent application

#### Advantages

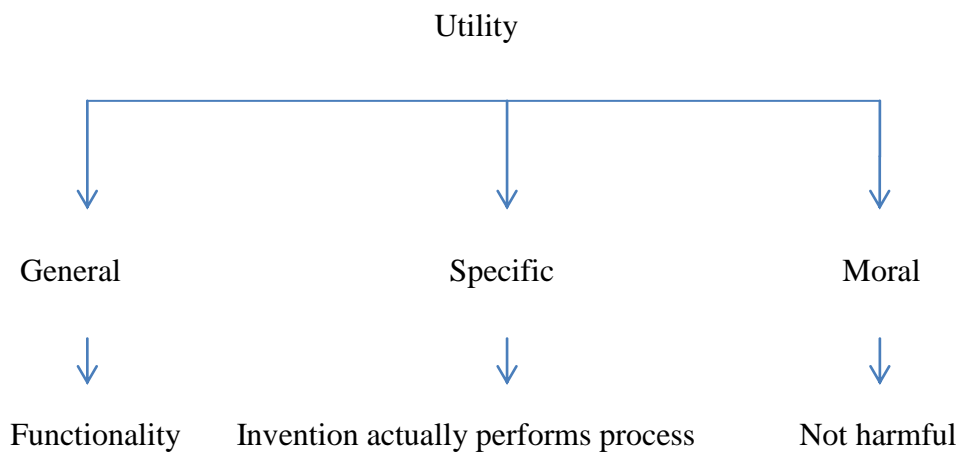
Patents provide incentives to individuals who are keen to invent by recognizing their creativity and rewarding them for their useful inventions. Such encouragement promotes innovation, which in turn improves the quality of human life. Also it helps the patent holders to generate .

#### Disadvantages

Patent filing incurs a handsome cost and demands liability.

#### 1.3.1 Types of Patent

- **Utility patent:** It includes a new process, machine, composition of matter, or any of these as an improvement of an existing idea. It lasts for 20 years from the date of application for a patent.



**Fig: 1.2 General Characteristics of Utility Patents**

- **Design Patent:** It has an aesthetic value only and should not be functional for instance, a design of chair, wallpaper, shoes, and jewelry. Its validity is for 15 years from the date of grant.
- **Plant Patent:** It includes patent for those plants which are asexually reproduced. Its validity is for 20 years from the date of filing.

### 1.3.2 Criteria for Patentability

- **Novelty:** Novelty is a basic patentability requirement. An invention is novel only if it has not been known before in any oral/written form. If it is not new and has been known before the date of filing of the patent application, or before its date of priority if the priority of an earlier patent application is claimed, then it is not patentable. The purpose of the novelty requirement is to prevent the prior art from being patented again.
- **Inventive step and non-obviousness:** The inventive step and non-obviousness reflects a same general patentability requirement present in most patent laws, according to which an invention should be sufficiently inventive — i.e., non-obvious in order to be patented. Even if an invention is new and useful, it cannot be patented if it is just trivial step forward in the art. Since the objective of the patent system stands as the advancement of science, therefore, it aims to protect those inventions which are not obvious to anyone skilled in the art if they apply their mind to it. In other words, the non-obviousness principle asks whether the invention is an adequate distance beyond or above the state of the art.
- **Utility:** The invention should have some industrial utility. It must satisfy some requirements of the humans must be capable of being useful in an industry.

### 1.3.3 Non-Patentable Subject Matter

There are certain subject matters which cannot be patented. These are as mentioned below.

- Laws of nature
- Abstract ideas
- Mental process
- Printed matter
- Computer software

- Method of doing business

### 1.3.4 Parts of a patent Application

An application for a patent as well as a granted patent has different parts, each part having its own significance.

- **Title** -As the name itself suggests, it is the title of the invention which is to patented
- **Abstract** -A brief idea on the what the invention to be patented is all about.
- **Field of invention** - Similar to the abstract, it tells about the novelty of the invention
- **Background** -This section gives a brief idea about the prior art or related art pertaining to the invention, where emphasis is put on the drawbacks of the existing technology as well as on the fact that how the current invention is an advancement of the existing art.
- **Summary** - This part summarizes the invention describing every relevant aspect of it in brief.
- **Brief description of drawing**
- **Detailed description of drawing-** Every single drawing given in the application is described in detail.
- **Claims** -These are the legal boundaries of the protection conferred by a patent.
- **Drawing**

### 1.3.4 Patent Family

A patent family is a set of all the patent applications as well as granted patents taken in multiple countries to protect a single invention by a common inventor(s) .A first application is made in one country – i.e. the priority – and is then extended to other offices. An INPADOC (International Patent Documentation Centre) patent family is defined as consisting of all the documents sharing directly or indirectly (e.g. via a third document) at least one priority. This includes all the patent documents resulting from a patent application submitted as a first filing with a patent office and from the same patent application filed within the priority year with a patent office in any other country.

### 1.3.5 Citations

References that are used in a patent to refer to earlier prior arts are given in a patent as citations. Some references are given by the applicant while some are cited by the examiner who examines the patent application.

- **Backward Citations:**

Reference of prior arts used in a patent are its backward citations . These are cited by the applicant as well as the examiner.

- **Forward citations:**

Reference of invention done in that field after the patent is issued. The patents citing this patent as the prior art are referred to as forward citations. This is quiet useful for patent search.

### 1.3.6 Granting of patents

Patents are granted by national patent offices of the countries where the applications are applied for the grant or regional offices that carry out examination for a group of countries – for example, the European Patent Office (EPO) and the African Intellectual Property Organization (OAPI). Under such regional systems, an applicant can request protection for an invention in one or more countries, and each country decides whether to offer patent protection within its borders or not. The WIPO-administered Patent Cooperation Treaty (PCT) provides for the filing of a single international patent application that has the same effect as national applications filed in the designated countries.

### 1.3.7 Important Dates in a Patent Application

Some dates hold great significance for a patent as they define the life of a patent as well define its legal status.

- **Invention date:** When an invention was completed.
- **Filing date:** The date of filling of application with completed information required.
- **Priority date:** The first date of filling of an application anywhere in the world.
- **Issue date:** Grant date i.e. the date on which the patent is issued from patent office.
- **Expiration date:** The date when a patent term ends.



- **Publication date:** The date on which patent information is made available to public 18 months after priority date

# CHAPTER 2

## 2. Modular Description of the Job

### 2.1 Types of Patent Applications

- **Ordinary Application:** The first application for a patent that is filed in the Patent Office without claiming priority from any application or without any reference to any other application under process in the Patent office is called an ordinary application. An ordinary application can be a Non-Provisional application which contains complete specification of the invention including the claims. However, application can be a Provisional application if contains only a basic idea of the invention without specifying the claims. A provisional application is filed only to obtain a filing date and is not examined by a patent office. It can be become an ordinary standard patent application after an year by filing a Non-Provisional application.
- **Convention application:** When an applicant files a patent application, claiming a priority date based on the same or substantially similar application filed in one or more of the convention countries, it is called a convention application. To get a convention status, an applicant should file the application before any of the patent offices within **12 months** from the date of first application in the convention country.
- **PCT- International Application:** The Patent Cooperation Treaty or PCT is an international agreement for filing patent applications. Such an application can be filed in a any PCT member state for obtaining a patent in many different countries after entering the 'National Phase' without the need for filing different applications in different countries. However, there is nothing called as a 'world patent'. The PCT application does not provide for the grant of an international patent, it simply provides a streamlined process for the patent application process in many countries at the same time.
- **PCT - National Phase Application:** The PCT-national phase must follow the international phase. The applicant must individually 'enter into the national phase'. i.e. he files a National phase application in each county he wishes to enter. The applicant can enter the national phase in up to 138 countries within 30-31 months (depends on the laws of the designated countries) from the international filing date or priority date (whichever is earlier). If the applicant does not enter the national phase within the prescribed time limit, the International Application loses its effect in the designated or elected States.

- **Continuing patent application:** Applications filed for a patent with respect to any improvement or modification in an invention described or disclosed in the complete specification in an already applied application or a patent are the continuing patent applications. These are of three types -
  - Continuation Application: The continuation application is the same disclosure as the parent application with claims similar to the parent application but with some more relevant text added in the description.
  - Continuation-in-part (CIP) application: Such an application contains new subject matter added to the claims of the parent application.
  - Divisional Application: A divisional application is one, which has been "divided" from an existing application. The applicant, at any time before the grant of a patent can file a further application, if he so desires or if an objection is raised by the examiner on the ground that the claims disclosed in the complete specification relates to more than one invention. A divisional application can only contain subject matter in the application from which it is divided (its parent), but retains the filing and priority date of that parent. A divisional application is useful if a unity of invention objection is issued, in which case the second invention can be protected as a divisional application.

## 2.2 Claims

It is the extent of the protection conferred by a patent or the protection sought in a patent application. It defines the scope of protection granted by the patent. It is more valuable to have claims that include the minimal set of limitations that differentiate an invention over what came before. Fewer limitations can increase rejection due to lack of novelty.

### 2.2.1 Types of Claims

- **Independent claims:** An independent claim stands alone and is self-contained. It is always broader than the dependent claims that follow.
- **Dependent claims:** It is dependent on parent claim and makes a reference back to the parent claim. It allows the applicant to include all the limitation of the parent claim. E.g. the hammer of claim1, further including a nail claw extending from the head and separated by a gap. It helps to cover the invention and various embodiments of the

invention. It is narrower in scope than parent claim. It can add features to parent claim but cannot delete any feature from it.

- **Multiple dependent claim:** It is a dependent claim, which refers to more than one other claim and must refer to such other claims in the alternative only. E.g. a hammer according to claims 2 or 3 further comprising a neoprene layer over the handle. A multiple dependent claim cannot serve as basis for any other multiple dependent claims. They have high filling fees.

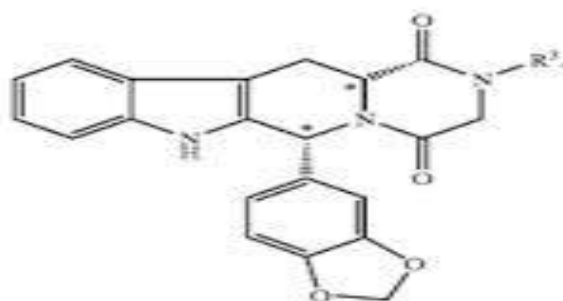
### 2.2.2 Various other forms of Claims

- **Jepson Claims:** It is an improvement of an existing invention. The improvement, the invention being improved and the elements that have been altered are mentioned. It is not used in domestic patent application but is accepted in USPTO. It helps in explaining the novelty easily. “Where in the improvement comprises” is always there in Jepson claim.
- **Reach Through Claims:** They seek to protect things which have not yet been discovered by an inventor but which might be discovered in future by making use of their invention.
- **Markush Claims:** Mainly used in chemistry, a markush claim is a claim with multiple “functionally equivalent” chemical entities allowed in one or more parts of a compound. Format: “selected from the group consisting of A, B and C”. Markush groups are simply listings of alternative elements in a peculiar format.  
E.g. “with nails, screws, bolts or glue” makes the claim indefinite. The use of the term ‘or’ is confusing as it does not tell which of the connectors is being claimed.  
“At least one of nail, a screw, a bolt and glue”. This format makes the claim more definite.

Format of Markush Claim:

“A chair held together with a coupling selected from the group consisting of a nail, a screw, a bolt and a glue.” Here the final connecting word is “and”.

What is claimed is:  
 1. A method of preparing a compound having a structural formula:



**Fig: 2.1 A Markush Structure, where the functional group can be one from a set of functional groups.**

- **Product by Process Claims:** It is a product claim where the product is defined by its process of manufacture especially in chemical and pharmaceutical industries.  
 “Product obtained by the process of claim X” or “Product made by the steps of”.  
 Products by process claims are almost always chemical inventions but they may be for a physical device.
- **Apparatus and Machine Claims:** They can be independent, dependent or multiple dependent. The term apparatus refers to a machine or device.
- **Article of Manufacture Claims:** Similar to machine or apparatus claim. It has no moving parts where as machine or apparatus does. It is a combination of elements that interrelate and are useful. E.g. lightweight hammer.
- **Mean plus Function Claims:** Claims that include one or more such means plus function elements are called mean plus function claims.

**Structure Claims:** It defines elements by structure. If claim for means for opening door but the drawing only shows a doorknob then the patent excluded any other way of opening door.

- **Omnibus Claims:** It is a type of claim that refers to the description, drawing and /or examples described in the patent specification without defining any technical features of the claimed product process.

Advantage: It provides a claim larger that may be held valid and infringed while all other claims are held invalid.

- **Swiss Type Claims:** It is a claim format intended to cover the first, second or subsequent medical use of a known substance or composition. It is used to protect the new features of a product. E.g. a drug is used to treat headaches but a person found it is useful to treat hair loss than the person can file a Swiss type claim for the 2<sup>nd</sup> use. Mainly used in pharmaceutical industry. Medical practitioners remain free to use the new purpose without fear of infringement yet the patentee has the ability to restrain the manufacture of the medicament for that purpose.
- **Programmed Computer:** A programmed computer claim is one of the forms – a general-purpose digital computer programmed to carry out such and such steps where steps are those of a method etc.

The basic idea is: A new program makes an old general-purpose digital computer into a new and different machine.

### 2.3 Patent Cooperation Treaty (PCT)

The Patent Cooperation Treaty (PCT) is an international patent law treaty, which provides a unified procedure for filing patent applications to protect inventions in each of its contracting states. It efficiently accomplishes the filing of an application in multiple countries.

There are different approaches for obtaining international patent protection

- Apply in each country separately in which a patent is sought. Cost is very high, documentation probe etc.
- Apply in accordance with the “Paris Convention for protection of industrial property”. It provides a 12 months delay and priority date etc. are main features.
- File a PCT application. It provides an inventor a 30/31 months delay; preliminary examination option and prior art search report depending upon the inventor’s wish in which he sought to get patent.

### 2.4 Patent Filing

Applicants for patents have many options with respect to the manner of securing a patent. Patent protection may be obtained through the filing of a “Provisional” patent application, an International (“PCT”) application, or a regular “Utility” application. Each strategy has advantages and drawbacks.

### **2.4.1 Provisional Application filing**

A Provisional Application can be filed just to gain the advantage of obtaining a priority date even when the invention is not yet finalized. It has minimal requirements and is not examined by the patent offices. However, within one year, a non-provisional application must be filed with complete specification of the invention in order to claim the invention.

### **2.4.2 Non Provisional Application filing**

The Non Provisional Utility Patent application is filed in a patent office giving complete specification of the invention, without claiming priority to a previous application such that the life of patent is counted from the date of filing of this application. In such a filing, the priority date as well as the filing date of the patent application is same.

### **2.4.3 PCT Application**

A patent application filed under PCT is called PCT application.

Steps:

- A single filing of PCT application is made with RO (Receiving Office) in one language.
- Search is performed by International Searching Authority (ISA) plus written opinion regarding the patentability of the invention, which is the subject of the application, is given.
- Preliminary examination is done by International Preliminary Examination Authority (IPEA) but it is optional.
- Following this, the applicant enters a national office where national regional authorities examine the application
- Then the final issuance of application takes place

**Some of the benefits of the system are:**

- It simplifies the process of filing patent applications i.e., an applicant can file a single international patent application in one language with one receiving patent office
- In order to simultaneously seek protection for an invention in up to 138 countries throughout the world.



- It provides internationally recognized priority date, which has an effect in each of the countries designated.
- Delays the expenses associated with applying for patent protection in various countries. PCT gives 30 to 31 months time to enter into various countries from the priority date or international filing date whichever is earlier unlike the convention method which gives only 12 months time to file for a patent application in the country of interest from the priority date. Hence, the PCT route allows the inventor more time to assess the commercial viability of his/her invention.
- It provides an international search report. The results of this search are very valuable to the applicant. They allow the applicant to make more informed choices early in the patent process, and to amend the application to deal with any conflicting material, before the major expenses of the national phase of the patent process begin.
- Provides an option of an International Preliminary Examination Report that is forwarded to the elected Offices and the applicant, the report containing an opinion as to whether the claimed invention meets certain international criteria for patentability.
- These reports give the applicant a fair idea about the patentability of the invention before incurring charges for filing and prosecution in each individual country.

### **Role of WIPO in PCT**

World Intellectual Property Organization (WIPO) is situated in Geneva, Switzerland. The international bureau of WIPO administers the international phase of the PCT application process. WIPO receives and store PCT applications and ensures the required format, declaration, filing fee for the patent. Defects and corrections are done at this stage itself. It helps to reduce formalities in the applying to the national patent offices.

WIPO also publishes the document which can be accessed from their website and its translation is also done at WIPO itself.

### **Filing under PCT**

#### **Alternative 1**

- File an international PCT application that complies with PCT formality requirements and pay one set of fees.

- At least one of the inventors is a resident of a PCT contracting state.
- It can be filed with the national patent office (which will serve as receiving office for the PCT) or directly with WIPO in Geneva.
- Time limits are given in the website of WIPO. Documents must be submitted within the time limit. The limits under PCT are measured from the priority date.

### Alternative 2

- File a national application first and then a PCT application within 12 months. Once a PCT application is filed, the inventor has up to 18 months to decide on which countries he wants to apply for patent.
- During the 12 months period following the filing of the priority application, the applicant can choose to file one or more additional national applications, as new refinements or embodiments of the invention are developed.
- PCT application can incorporate the disclosures of, and claim priority to, all the national applications directed to that invention that were filed during the previous 12 months period.
- PCT application can also include new disclosure pertaining to the invention or new claims that were not set forth in any of the previous priority applications. However, to obtain benefit of earlier priority date, the new claim must be supported by earlier priority application.

## PCT TIMELINE

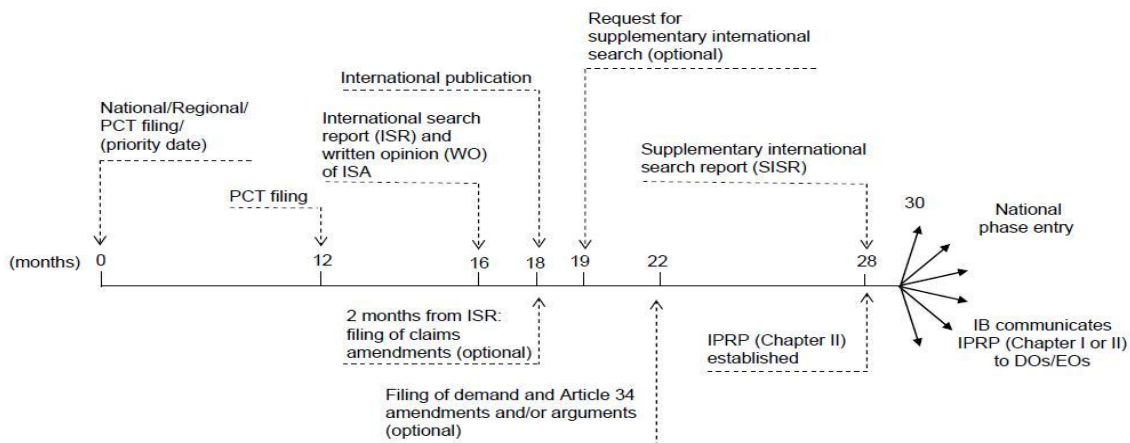


Fig: 2.2 PCT Timeline

Total delay = (12 + 18) months

1. National application (priority date claim)
2. Within 12 months PCT application is filed
3. After PCT application, within 18 months of that time or within 30 months of priority date we can enter the national phase.

## **2.5 Patent Classification System**

Any patent office has patent documents arranged and categorized in an orderly manner on the basis of the classes of the technical areas which are covered by the invention. Each invention is categorized under appropriate technical classes and subclasses.

For the same there are different types of patent classification systems which are:

- International Patent Classification (IPC), which is agreed internationally.
- United States Patent Classification, which is fixed by USPTO.
- European Classification (ECLA), which is adopted by the European Patent Office (EPO).
- F-terms and FI Index (Japanese Classification)
- Locarno Classes (International Classification of Design Patents)
- Cooperative Patent Classification (CPC): It is joint partnership between USPTO and EPO to integrate toward a common classification system. It is largely based on ECLA and is modified to ensure compliance with the IPC administered by WIPO. CPC is an effort to bring the best practices of USPTO and EPO together and to make patent research internationally compatible.

The purpose behind classification is to make patent searching and retrieving easy

### **2.5.1 Classification Based Searching**

Patent Searching on the basis of different classification systems of patents greatly helps in extracting those results which are sometimes not covered up by searches based on keywords. It gives results which have great relevance to the technological concept of the invention

#### **Advantages**

- Wider coverage of results than text searching.
- Independent of the language syntax.

- Independent of changes in terminology.
- Concept search.
- Available for patent documents where no full text of claims/description is available.

### **Disadvantages**

- Complex structure of classifications.
- It requires study of classification rules.

## **2.6 Different Types of Searching**

### **2.6.1 Novelty search**

This is the most common type of search and is also called as the patentability search. It is conducted when an inventor wants to know whether the invention can be patented or not. It requires to find if a prior art that already exists and which can prove that the invention is not novel. There is no date constraint for a novelty search. Any form of an existing prior art is a useful result for the inventor in such a search.

### **2.6.2 Validity Search**

The idea is to find prior art that is relevant to the validity of the CLAIMS of the subject patent. Not the general idea, not the entire patent but each claim. Thus it allows the claims to be disallowed on the grounds that someone came up with the invention before the patent in question was filed. Filing date is very important to prove that he/she was the first person to come up with the invention. NOTE we do not cite any prior art that has already been referenced by the subject patent. Relevant art does not have to be in the claims of other patents. It can be in the description also. Independent claims are the targets in validity search.

### **2.6.3 Infringement Search**

Patent infringement is a prohibited act with respect to patented invention without permission from the patent holder. In many countries, the use should be for commercial purposes to constitute infringement. The extent of protection provided by the patent is defined in the claims of the granted patent. Patents are territorial and infringement is only possible in a country where patent is in force. If the infringing party's product falls within one or more of the claims of the patent, then the product is said to be infringing that patent. In this we have to find some product

which infringes the claims of the subject patent. Search is focused on the products, which are introduced in the market after the subject patent has been granted.

#### **2.6.4 Freedom-To- Operate Search**

It is a search done on issued patents or on pending patents to determine if a product is infringing any of the claims of the issued or pending patents. It is conducted to ensure that a product can be commercialized without infringing any patent. It may also include expired art that acts as a safe harbor permitting the product or process to be used on patents in publications.

#### **2.6.5 State of the Art Search**

The current technology or a product being developed in a particular field of interest is searched. Patents pertaining to a specific technology are read and analyzed. It is done to provide direction to the research being done in the company or organization. Each and every patent on given technology is searched. Similar to this is a landscape search which focuses on the entire filing and market trend of patents filed on particular technological field of interest.

# CHAPTER 3

### **3 Patent Searching**

The most critical aspect of patent searching is for the searcher to understand as to why a particular search is requested no matter what type of search is requested. Searching is an iterative process. The searcher's knowledge of information resources that are available and understanding the requestor's requirement is very useful in defining the scope of the search.

A searcher must be proficient in searching different information sources as well as should be well acquainted with the technical or scientific background specific for the subject matter at hand. Following a particular strategy for searching always proves beneficial. Patent literature is highly organized, highly consolidated, and has good consistency between documents. Thus, the benefit that can be incurred from these characteristics during searching of patent literature is that a highly systematic methodology can be used. Searchers of patent literature have a number of valuable tools at their disposal: Citation Searching, Bibliographic Data Searching, Classification Searching, Full-Text Searching. Following are the different types of patent searches.

#### **3.1 Patentability Search**

Also referred to as Novelty search, is the most common type of search. These searches have no date constraints on the prior art. It helps the inventor to determine whether or not a prior art on the invention already exists which means that the invention is not novel and cannot be patented. Any form of existing prior art is a relevant result for the inventor. It is based on the sole criteria of novelty and non-obviousness. Novelty/patentability search helps to evaluate a particular invention and provides an insight into the already existing technologies. It is important to conduct patentability searches before filing a patent application, while drafting the claims of a patent and during the invention review cycle.

A patentability search is designed to tell you the likelihood of obtaining a patent on your idea. Although the law does not require that you do a patentability search before filing a patent application, however often such a search is the right first step in the patent process. While conducting this search, some aspects need to be specifically taken care of.

- Time is often an obstacle with patentability searches. A patentability search is often a short search ranging from anywhere between 4 hours and 20 hours. Because they are

short in nature, it is important to understand the main novel idea of the invention disclosure to be searched. By doing so, a searcher will be able to quickly scan a large set of search results looking for prior art that appears relevant to the main idea. Upon finding the relevant art, the searcher can then determine if the art has additional search features of interest.

- In addition to finding related art, some patentability searchers may also be tasked with identifying less relevant documents that could contain "alternative embodiment" ideas that will be included in the drafting of the patent specification. Alternative embodiments are changes made to an invention's non-essential or non-novel parts, but that show how the invention could be adapted to work in different situations or with existing products. For example, an invention for a curtain-hanging device could work whether the user was hanging curtains, drapes, or valances, and it might also work for hanging blinds. Or, as another example, a novel design for a jacket that holds an MP3 player in an inner pocket would work whether the inner pocket was detachable, or sewn into the jacket fabric.
- Alternative embodiment searching may not be necessary in all patentability searching. The bottom line is that searchers should always discuss the main goal of the search with a patent attorney, and tailor the focus of the search (and what kind of results are returned by the search) to the requesting party's specifications.
- A patentability search will usually include a search in major patent collections, normally encompassing at least the United States (US), European (EP), Patent Cooperation Treaty (WO/PCT) and Japanese (JP) collections. Although any prior published document can be used against a patent application, most patent examiners from major patent offices will go straight to these collections, so it makes sense to include them in any patentability search. The patent search tool should be selected so as to gain necessary basic coverage, but pricing is usually a constraint with shorter patentability investigations. Many commercial and free tools will have some coverage in US and major foreign country databases.

### **3.2 Validity Search**

It is conducted to find prior art that is relevant to the validity of the claims of the subject patent. Neither the general idea, nor the entire patent but each claim. Thus it allows the claims to be disallowed on the grounds that someone came up with the invention before the patent in question was filed. Filing date is very important to prove that he/she was the first person to come up with



the invention. Note: We do not cite any prior art that has already been referenced by the subject patent. Relevant art does not have to be in the claims of other patents. It can be in the description also. Independent claims are the targets in validity search.

A validity search also helps with the valuation of a patent. If a closely related prior art is discovered that may cast doubt on the validity of the subject patent, the patent may be considered "weak." On the other hand, if the search does not discover these other documents, the subject patent may be considered "strong." Such an investigation plays an important role when licensing agreements or other royalties are being negotiated between the subject patent holder and a third party interested in practicing its claimed subject matter.

One important consideration during a validity search is claim interpretation. Because validity searches are performed on patents that have already been examined and allowed, a broad interpretation of the allowed claims is necessary to find further relevant art. It is very essential for the searcher to give the selected claims a broadest reasonable interpretation. Even if such an art does not seem to throw a direct challenge to the claims, it may still form the basis for a legal argument against validity.

Successfully defining the scope of a validity search usually requires a strong understanding of the current state of the technology field, as well as a positive approach towards identifying analogous technologies that may also fit into the claim limitations. A step in the specific shows an example of dividing a claim into its particular limitations; this activity can help the user in his or her quest to achieve the broadest possible interpretation.

Another aspect of a validity search can be referred to as an Invalidation Search. It is usually conducted when someone wants to invalidate a patent and prove that it should not have been granted at the first place or when someone gets sued for infringing a patent. If a patent owner sues some other party for infringing patent, then the accused party can conduct a search so as to invalidate a patent. Patents can be invalidated in certain cases when owing to some unintended human errors, a patent examiner approves of a patent application for a grant even though it should not have been. So, if the accused party is able to gather results for invalidating a patent, they can escape the acquisition. Similar to the validity search, such a search too requires a very clear understanding of the claims and invention covered in the subject patent.

Date constraint is very important for a validity as well as an invalidation search such that the search is performed only for the time period that lies before the earliest priority date of the

subject patent. This date constraint is dependent on the national laws in the issuing country from which the subject patent originates. The laws which govern the novelty, non-obviousness and application of an invention are all carefully dealt with while conducting a validity search of a patent

A validity search should cover the entire body of potential prior art that can be used to reject the original patent application. To meet these requirements, search tools selected for a validity search should be extended, reliable coverage in US and major non-US full text collections, as well as a complete worldwide bibliographic and family collection from at least one of the two major sources, the EPO's INPADOC/DOCDB file and the Derwent World Patents Index. Free tools such as the EPO's espacenet or Google Patents should probably not be used as primary sources, but can serve as useful supplementary sources of information, such as for free patent PDF downloading.

### **3.3 Infringement Search**

Patent infringement is the act of making and selling a product which is identical to a patented invention without the permission from the patent holder. The extent of protection provided by the patent is defined in the claims of the granted patent and if the infringing party's product falls within one or more of the claims of the patent then a product infringes that patent. Patents are territorial and infringement is only possible in a country where patent is in force. In this search we have to find a product of some company, which infringes the claims of the subject patent. Search is focused on the products, which are introduced in the market after the subject patent has been granted.

An infringement search primarily requires the searcher to analyze the claims of enforceable (or "live" or "in-force") patents, and published applications that may proceed to grant. The goal of the search is to uncover patents with claims that could represent an infringement risk to a new product, and the search should take place before the product is released to market. Infringement searches may also cover expired patent art, and sometimes non-patent sources such as product literature.

Infringement searches can sometimes be extended to include expired art, where searchers may find "safe harbor" (Freedom-to-Operate) patents which show material that has entered into the public domain. Finding expired art during the search process may allow an inventor to create,

change, and/or tweak current processes of the invention to “design around” possible cases of infringement.

The biggest obstacle for preparing an infringement search strategy is the need to understand and predict all potential generic claim language that a new product might infringe upon. To compensate for this, a searcher must be able to identify technology areas and/or applications, which are equivalent or analogous to the product being searched. To illustrate this point, take the following example. A product disclosure states: "A bag closure clip including a pair of opposing T-shaped clip members held in pivotal engagement by a U-shaped metal spring. Each clip member includes a jaw, a handle, and a fulcrum. As the handles are squeezed toward each other, the jaws open to allow a bag, such as for snack food or cereal, to be inserted between the jaws. When the handles are released, the spring forces the jaws toward each other to grip the bag and hold it closed." A quick search of the US classification system shows that US Class 24 defines subclasses for various embodiments of clips, clasps, buckles, and fasteners. This is an obvious place where patents having claims that the disclosed bag closure clip may infringe upon could be found. However, this is not the only place the searcher should look. Other classes may be applicable, such as Class 132, which includes subclasses for squeeze-open clips for hair, etc.; Class 223 includes clothespins; Class 439 includes jumper cables; and Class 606 includes surgical clamps. All could potentially have devices that claim the structural elements of the disclosure.

It is also necessary to carefully evaluate the claimed material to determine whether it could possibly encompass the proposed product of interest, especially when there are any vague limitations within the claims. For example, an infringement search could be conducted on a product that has the feature of “a radio frequency identification (RFID) tag.” If a patent document is found that is related to the search subject matter, and claims an “inventory item marker,” at first, the searcher may not think that the claim is relevant to the search. However, after reading more of the document, it might become clear that the “item marker” could be an RFID tag, as seen in the embodiments described in the specification. Thus, the claim could be interpreted as possibly including the feature of interest. (This example is used here to show how claim language should always be given its broadest possible interpretation, and any final decisions should be left to the search recipient. In general, when there is any doubt about whether

a claim could possibly encompass the search subject matter, that patent should be included in the search results.)

Non-patent sources are usually not primary sources for an infringement search. However, this type of search can include non-patent sources, especially product literature, as a means of identifying potential competitors in the market. Examining the patent holdings of close competitors is an important strategy in infringement searching, since the patented material from companies with similar products will be highly relevant to the search. Another consideration is that due to the lag between the filing and publication of a patent application, product literature may show the existence of a similar new product before its related patent applications are published.

### **3.4 Freedom-To-Operate Search**

It is a search done on issued patents or on pending patents to determine if any product is a potential infringer any of the claims of the issued or pending patents. It may also include expired art that acts as a safe harbour permitting the product or process to be used on patents in publications.

Freedom to operate", abbreviated "FTO", is usually used to determine whether a particular action, such as testing or commercializing a product, can be done without infringing the valid intellectual property rights of others.

Since IP rights are specific to different jurisdictions, a "freedom to operate" analysis should relate to particular countries or regions where you want to operate. If you want to commercialize a new cancer drug in your own country, for example, you might have complete freedom to operate with that if there are no patents, covering that particular composition of the drug or the process used to make it in that country. But, you might not have the same freedom to operate if you want to market it in another country, where patents or other IP rights may have been issued covering your invention

If you discover a patent application or patent in the database that seems to relate to the action for which you are seeking FTO, you can't immediately conclude that there isn't FTO, because for a variety of reasons the matter claimed in the patent could be available to use. For example:

- Patents may not have been applied for in many countries; the claimed matter is protected only where there is a patent.

- Patents may not have been granted in some of the countries where applications were made; laws about what is patentable vary between countries.
- Patents that were issued may not still be in force if the patentee has not made regular payments due.
- Patents are a limited monopoly and they do expire (check expiration dates!).
- Some countries have exemptions for certain actions (for example, Germany is enacting a research exemption, and New Zealand has an exemption for certain types of clinical trials).
- Patents that were issued in different countries may have broader or narrower claims---so it is really important to look at the claims to see what they read on.

If you ask an attorney to render an FTO opinion, that might consist of finding such IP rights, issue jurisdictions, expiry dates and so on, and also assessing how the issued claims are to be construed and whether or not the issued claims might be invalid. Most commonly, claims in a particular patent could be invalid because there is a prior art, perhaps a publication or a public presentation about the matter claimed in the patent, that the patent examination process didn't find. In some countries a patent could be vulnerable to challenge because an inventor wasn't properly named.

### **3.5 State of the Art Search**

In this search one looks for what is currently being developed in the field of interest. The purpose of the State of the Art search is to gain an overview of a particular product or technology and so patents pertaining to a specific technology are read and analyzed. It is done to provide direction to the research being done in the company or organization. Each and every patent on given technology is searched which is why the data set retrieved is quite large. Therefore, searcher needs to have a good understanding of what the requestor is looking for to enable quick review of the results for relevancy. Similar to this is a landscape search which focuses on the entire filing and market trend of patents filed on particular technological field of interest. A landscape search is conducted so as to inform the search recipient about all the patents filed on a particular technological field of interest as well as a comprehensive graphical representation of the filing trend of the identified patents is given to the requesting party.

# CHAPTER 4

## **4. Basics of US Patent Laws**

For any patent searcher, US patent laws (Title 35 of United States Code U.S.C) are very vital to know especially while conducting an invalidation search.

### **4.1 35 U.S.C. 101- Inventions Patentable**

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title. This may seem expansive, but certain subject matters are not patentable, what are called 101 judicial exceptions.

Patents are not granted for all new and useful inventions and discoveries. The subject matter of the invention or discovery must come within the boundaries set forth by 35 U.S.C. 101, which permits patents to be granted only for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof."

The term "process" as defined in 35 U.S.C. 100, means process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.

### **4.2 35 U.S.C. 102- Conditions for patentability; Novelty**

35 U.S.C. 102, entitled "Conditions for Patentability"; novelty describes some of the conditions when a patent should not be granted to an inventor based on the concept of novelty. These conditions generally relate to when an invention is already known publicly. Each subsection of section 102 describes a different kind of prior art, which can be used as evidence that an invention is already in public. This includes inventions that have already been described in other patent applications or publications. It also includes inventions that have been on sale for more than a year before a patent application was filed.

This section of US code was affected by the America Invents Act (AIA), and now reads as follows:

A person shall be entitled to a patent unless —

- The claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention; or

- The claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122 (b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

For the time period that lies before the date on which AIA came into existence, these laws are referred to as Pre-AIA 35 U.S.C. 102.

**Pre-AIA 35 U.S.C. 102- Conditions for patentability; novelty and loss of right to patent.**

**There are seven sub-sections for 35 U.S.C. 102, namely (a),(b),(c),(d),(e),(f),(g)**

A person shall be entitled to a patent unless -

- a) The invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
- b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or
- c) He has abandoned the invention, or
- d) The invention was first patented or caused to be patented, or was the subject of an inventor's certificate, by the applicant or his legal representatives or assigns in a foreign country prior to the date of the application for patent in this country on an application for patent or inventor's certificate filed more than twelve months before the filing of the application in the United States, or
- e) The invention was described in - (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language, or
- f) He did not himself invent the subject matter sought to be patented, or



- g) During the course of an interference conducted under section 135 or section 291, another inventor involved therein establishes, to the extent permitted in section 104, that before such person's invention thereof the invention was made by such other inventor and not abandoned, suppressed, or concealed, or (2) before such person's invention thereof, the invention was made in this country by another inventor who had not abandoned, suppressed, or concealed it. In determining priority of invention under this subsection, there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.

Sections 102 (a), (b) and (e) are the most important considerations when determining patentable subject matter during patent prosecution.

#### **4.3. 35 USC 103 Conditions for patentability; Non-obviousness**

35 U.S.C. 103 describes the condition of patentability referred to as non-obviousness. This provides that a patentable invention must not have been obvious to a "person having ordinary skill in the art" (PHOSITA) in view of the appropriate prior art.

The most important section of section 103 is 103(a) It states:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

#### **4.4 35 U.S.C. 112 - Specification**

35 U.S.C. 112 dictates the form and content of the specification and the form and content of the patent application's claims. The first paragraph introduces 3 legal concepts, the written description requirement, the enablement requirement, and the best mode requirement. The second paragraph limits the ability of claims to be too open-ended or unclear.

- The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to

enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.
- A claim may be written in independent or, if the nature of the case admits, in dependent or multiple dependent form.
- Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.
- A claim in multiple dependent forms shall contain a reference, in the alternative only, to more than one claim previously set forth and then specify a further limitation of the subject matter claimed. A multiple dependent claim shall not serve as a basis for any other multiple dependent claims. A multiple dependent claim shall be construed to incorporate by reference all the limitations of the particular claim in relation to which it is being considered.
- An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

# CHAPTER 5

## **5. Project Undertaken**

### **5.1 Patentability search**

A patentability search involves searching the prior art, which includes published patent applications, issued patents, and any other published documents, with the aim of determining whether filing your patent application makes sense or not. If one finds prior art that describes the invention completely or renders it obvious, one probably should not try filing an application for an invention that cannot be patented. A patentability search is sometimes called a prior art search or simply just a patent search.

Before filing an application, it is quite advantageous to perform a preliminary patentability search. Doing so will provide an idea of the closest related prior art, and allow the patent claims to be drafted "around" this previous art, so that the novelty of the invention will appeal more clearly to the examiner.

In addition to being used as a preliminary research tool, a patentability search can aid in the drafting of an application. The search will help define an appropriate dimensions for the claims of a future patent application as well as act as an aid in finding which aspects of the technology to focus an application on.

#### **5.1.1 Obstacles Facing the Searcher**

Time is often an obstacle with patentability searches. A patentability search is often a short search lasting for about a few hours or couple of days. Owing to this, it is important to gain a clear understanding of the novelty of the invention disclosure to be searched. By doing so, a searcher can quickly scan a large set of search results looking for a relevant prior art. Upon finding the relevant art, the searcher can then determine if the art has additional search features of interest.

In addition to finding related art, some patentability searchers may also be tasked with identifying less relevant documents that could contain "alternative embodiment" ideas that will be included in the drafting of the patent specification. Alternative embodiments are changes made to an invention's non-essential or non-novel parts, but that show how the invention could be adapted to work in different situations or with existing products. For example, an invention for a stent made of a biodegradable material can work as one for different aparts of the body as mentioned in other embodiments even though it is patented for one particluar type of use.

Alternative embodiment searching may not be necessary in all patentability searching but does hold significance in some cases

### **5.1.2 Searching Patent Documents**

A patentability search usually includes a search in major patent collections, normally encompassing at least the United States (US), European (EP), Patent Cooperation Treaty (WO/PCT) and Japanese (JP) collections. Although any prior published document can be used against a patent application, most patent examiners from major patent offices will go straight to these collections, so it makes sense to include them in any patentability search. The patent search tool should be selected in a manner so as to gain necessary basic coverage, but pricing is usually a constraint with shorter patentability investigations. Many commercial and free tools will have some coverage in US and major foreign country databases.

### **5.1.3 Searching Non-Patent Literature**

A patentability search will also include a non-patent literature search. Major non-patent literature sources encompassing many technical subject areas include, but are not limited to:

- Engineering Village (subscription)
- Scopus (subscription)
- Google Scholar (free)
- Google (free)
- IEEE explore (subscription)
- Science direct (free)
- Wikipedia (free)
- Pubmed(subscription)

### **5.1.4 Specific Search Strategies**

These search strategies are examples of specific best practices that can be applied during the course of a patentability search

- Always discuss the general search focus with the search recipient. Determine whether there is a need to search for documents, which may describe alternative embodiments, or if only direct prior art is needed.

- Ask the search recipient if potential claims have been drafted for the patent application. If so, the searcher should discuss whether a search on all of the claimed features is needed, just like the examiner would perform upon receiving the application. (Sometimes patentability searches are performed to determine whether further research is viable before proceeding, and thus initial claims are not always available.)
- Always perform a search on the inventor name to get an idea of the person's core research interests. Collaborators and heavily cited colleagues are possible influences/sources of similar art.

### 5.1.5 Typical Search Sequence

The following search sequence is a generic progression of search steps that could be applicable to many prior art investigations.

- Understanding phase: This usually requires reading of one or more technical publications in the field of search where familiarity is lacking. If the person who requested the search does not have any recommendations, a web search on the general search topic is usually good place to start for identifying these resources. Performing an entity search on any known authors or applicants can also help to orient the searcher and identify some useful references as a starting point.
- Full-text search to quantify the scope of the art: Where the scope is broad, research the topic to narrow the scope with more specific search terms. For example, in a chemical engineering reactor search, a fluidized bed reactor or a packed bed reactor can also be use as a title. If a packed bed reactor, what other terms are typically used for the reactor type and specific media used therein? Use an industry standard resource to become familiar with the terms of art.
- Identifying relevant prior arts: Identify related patent documents to determine more specific terms related to art in the field. (To continue the reactor example, a document may disclose silica as a type of inert media used in a packed bed reactor. However, silica is merely one species of inert media used in this type of reactor. Identify the other species and consider including them as additional keywords to broaden the search when appropriate.)

- Classification based search: Narrow the search body with the most relevant classes and subclasses from the appropriate classification area(s) of interest. Patentability searches that encompass US art will benefit from a US class search in that collection, while at least IPC and/or ECLA classes should be used to adequately cover collections from other patent issuing authorities.
  - Search all relevant art within each chosen subclass. Review each central reference for additional keywords and structural features that can be used to improve the full-text searching in .
  - Iterate the above two steps to dig out additional references.
  - Examine key central references for classes and subclasses not originally considered and repeat with respect to each new subclass.
  - Return to the full-text searching body and search the art for more recently identified keywords. If the search engine permits it, exclude search strings or subclasses, which were already fully reviewed.
  - Search the remaining body of art using keywords found from central references, client notes, Examiner suggestions, etc.
  - Perform a forward and backward citation search on each centrally relevant reference found during the search. Examine any relevant document discovered by this process to ascertain why it was not discovered during the text/class search. Perform additional search iterations to cover any newly identified classes or keyword terms.
- Finally, compile the results in a formal report and submit to the client.

## **5.2 Invalidation Search**

A validation/invalidation search seeks to uncover patents or other published prior art that may render a granted patent invalid. The search results consist of a search report, a claims mapping chart, and citation of prior art. The results of the search are used to invalidate a patent involved in infringement litigation or to support due diligence and ascertain the validity of a patent.

A client who is concerned about his product infringing a particular patent conducts a patent validity/patent invalidity search.

Whenever a company is concerned that its product might infringe another company's patented product/process or another company alleges infringement of a patent on a company, a patent

invalidation search can be performed to invalidate the claims of the granted patent. Patent Invalidation Search is performed to identify documents or prior use that may reduce the claims of a granted patent, thus invalidating it. The aim of the search is to uncover prior art or prior use, which limits the scope of the granted patent. Detailed research is conducted to determine whether the claims of a particular patent are valid or invalid when analyzed and compared to the prior art available on the date of filing.

### **5.2.1 Obstacles Facing the Searcher**

One important consideration during a validity search is claim interpretation. Because validity searches are performed on patents that have already been examined and allowed, a broad and clear interpretation of the allowed claims is necessary to find a relevant prior art. Furthermore, this interpretation must be discussed and clarified with the search recipient. Even if such an art does not seem to throw a direct challenge to the claims, it may still form the basis for a legal argument against validity. Successfully defining the scope of a validity search usually requires a strong understanding of the current state of the technology field, as well as some creativity when identify analogous technologies that may also fit into the claim limitations. A step in this consideration can be dividing a claim into its particular limitations; this activity helps the user in his or her quest to achieve the broadest possible interpretation. It must be stressed, however, that the interpretation of the claims should also be discussed with the search recipient (a patent attorney), and agreed-upon prior to the start of the search. As in all patent searching, the searcher should get as much direction as possible from an attorney, and the task of interpreting any claims should fall directly to an attorney.

Another consideration in validity searching is determining the search cut-off date, as in the priority date or the publication date (or it can be any other date as and when required) that is considered in an invalidation search. Put simply, the search cut-off date should be determined to encompass any prior art that might defeat the subject patent's validity. This date is dependent on the national laws in the issuing country from which the subject patent originates. There are a number of legal concerns that dictate what cut-off date should be used for a validity search; however, in all cases, a qualified attorney must determine this date.

Sometimes, the search recipient designates a search cut-off date of 3 to 5 years after the filing date of the patent to be searched. This is especially useful in certain emerging technologies,



where searchers may find highly relevant references published after the filing date of an early seminal patent under validity investigation. Tracing their origins back to an early obscure conference proceeding or other hidden source can form the basis for a legal argument against validity. However, searchers should also note that the number of publications for a quickly moving technology might accelerate after a certain seminal publication in the technology's history, meaning that a post-filing-date search could result in too many useless references. When this happens, searchers should consult with the search recipients to determine whether it is appropriate to move the search cut-off date back to an earlier date.

Another obstacle that arises is when Internet publications are found containing information that appears relevant to a validity investigation. Any publicly available information can be used to make a case against validity, but there is a need to prove that the information was in fact available before the effective filing date of the patent document. One way to do this is to use Internet archiving services, which have been crawling the web and making date-stamped copies of web pages. The most well-known of these is the Internet Archive (also called the Wayback Machine), available [here](#). This service will not index some pages, for example, those pages that are marked with a robots.txt file to discourage web crawlers, or "orphan" pages that are not linked by any other web pages on the net. Still, there is a chance that technical information publicly available on the web can be date-stamped using this resource.

Another useful tool in a validity/invalidation search is the patent's prosecution history (also sometimes called a "file history"). A prosecution history is a record of all correspondence between a patent applicant and the patent office that examined the application. It may contain a search report filed by the examiner, which can be a helpful starting-off point for the searcher. It will also often contain a reasoned statement written by the Examiner considering the prior art found during the search, and explicitly describing the novel claim limitations that allowed the patent to be issued in consideration of past inventions (in the US, this document is called the Reason for Allowance). Because it states exactly which claim limitations were not found in the prior art, this document is sometimes helpful to determine the focus of validity investigations, although the exact search strategies and claim interpretations should always be controlled by a qualified patent attorney.

Locating the prosecution history can be a tricky business. In the US, some newer patent prosecution histories may be accessed online via the USPTO Public PAIR service. A prosecution

history for a newer document may be available as an Image File Wrapper (or IFW), meaning it is fully available online in PDF format but older documents may need to be ordered from a prosecution history service, where employees physically retrieve the records and make copies. Similarly, the EP maintains a system for accessing prosecution histories online, at the EPO's Register Plus service; although not all EP prosecution histories are available this way. The situation gets even trickier when a prosecution history is needed from other patenting authorities. Some patent office's allow physical inspection of their prosecution histories, but do not allow them to be copied. In addition, some patent offices may destroy their records due to lack of storage space.

### **5.2.2 Searching Patent Documents**

A validity search should encompass the entire body of potential prior art that can be used to reject the original patent application. (However, due to the legal complexities involved in what material can be used to reject patent claims, a patent attorney should always determine the "search cut-off date".) To meet these requirements, search tools selected for a validity search should have extended, reliable coverage in US and major non-US full text collections, as well as a complete worldwide bibliographic and family collection from at least one of the two major sources, the EPO's INPADOC/DOCDB file and the Derwent World Patents Index. Free tools such as the EPO's esp@cenet or Google Patents should probably not be used as primary sources, but can serve as useful supplementary sources of information, such as for free patent PDF downloading.

For validity searching in older technologies, specifically the mechanical arts, it is very advisable for searchers to select a data source with a complete collection of US full text patent data. In the mechanical arts, it is possible for a current idea to actually appear in the patent literature far earlier than 1976, the date at which many US full text collections begin in electronic sources. Micro Patent PatentWeb, Thomson Innovation, LexisNexis TotalPatent, and Google Patent Search are examples of sources, which provide complete US full text back file data.

Citation searching is another valuable tool during any search effort. The searcher should attempt to get an idea of the closest art found during the initial search cited by the examiner, to understand which claim limitations the examiner discovered, and which were not found, allowing the patent to issue. (The patent file history should also be consulted, whenever possible,

to gain an understanding of the reasons for allowance. For US patents, this can be done using Public PAIR, and for EP patents, using the EPO's Register Plus service.)

The essential features in any full text patent search tool to be used for validity searching should include:

- Highest quality data possible
- As much back file data as possible
- Efficient citation search features
- The ability to limit the search by date using publication, application or priority date

### **5.2.3 Searching Non-Patent Literature**

A validity search must also include a non-patent literature search, encompassing any document published before the search cut-off date. Recommended non-patent literature sources for various technical disciplines can be found in their respective best practices articles. All kinds of individual journals, books, and even web pages can be sources of relevant prior art during this type of in-depth investigation.

Validity searches by nature are intended to be more extensive and in-depth than the search, which was performed by the examiner who issued the patent. For that reason, validity investigations often require searchers to consult obscure, unusual, and remote sources of potential prior art. Failing the ability to go to a nationally recognized source, searchers might consider gaining access to university libraries in their area.

Major non-patent literature sources encompassing many technical subject areas include, but are not limited to:

- Engineering Village (subscription)
- Scopus (subscription)
- Google Scholar (free)
- Google (free)
- IEEE explore (subscription)
- Science direct (free)
- Wikipedia (free)
- Pubmed(subscription)

#### 5.2.4 Specific Search Strategies

Following are the search strategies that can be applied during the course of an invalidation/validity search.

- Develop the search features by making each limitation of the claims its own feature. Through discussion with the search recipient, identify the various limitations which are likely to be the most difficult to find in the prior art. (Usually, the searcher must ensure that every limitation of the selected claims is included in the search features). However, the purpose of breaking the claim into its component features is that it will be easier to find pieces of the claim, rather than the entire claim in entirety. Because examiners can combine multiple patent references to prove non-obviousness, a validity searcher must look for individual “pieces” of a claimed invention rather than only focusing on the whole.
- Agree on and clarify the broadest reasonable interpretation of claim limitations with the search recipient. Claims in a validity search should always be given the broadest reasonable interpretation; a patent attorney should always be consulted during this process. This step is crucial for searchers to fully understand what to include and exclude in the search results.
- Identify keywords from the claims of the patent. A patent drafter can pick words he/she wants to use and lay stress on specific words. The reverse is also true which means that he/she may avoid words that are less important. A neat way to start an invalidity search is to pick keywords based on the patent drafter’s focus. Generally, a patent drafter would use important keywords in the claims and use them repeatedly. A searcher can tap this resource and pick out such words. This will ensure that the searcher begins the search on the right track, making the initial searches highly focused.
- Establish a search cut-off date with the person requesting the search. Due to a number of legal complexities involved in determining what kind of prior art can be used to challenge validity, this date should always be determined by a patent attorney. A common range will be 3-5 years after the filing date of the subject patent.
- Scan through the file history of the subject patent. The patent prosecution is a tool that can provide some extra help and useful clues to the validity searcher. The examiner’s original search report, including the field of search and relevant results found by the

search, is often contained in the prosecution history. Also, the prosecution history can provide some answers to questions as to why did the examiner allow the patent application and what feature was the examiner unable to find in the prior art? In US, the patent prosecution history contains a copy of a special document known as the examiner's Reason for Allowance, which states as to why the application was allowed to issue as a patent. Searchers should discuss the conclusions drawn from examining the file history with a patent attorney before they are used to direct the search.

Scanned US prosecution histories can be found via the USPTO Public PAIR website (<http://portal.uspto.gov/external/portal/pair>), while EP file histories are available from the EPO's Register Plus service (<https://register.epoline.org/espacenet/regviewer?lng=en>). For non-US or EP patent documents, the file history may need to be ordered via proxy from the issuing patent office, if the search time budget allows.

- When reporting the results of a validity search, consider using a feature matrix to note key subject areas addressed by each reference. Always relate the results to the claimed subject matter.

### **5.2.5 Typical Search Sequence**

The following search sequence is applicable to validity/invalidation prior art investigations..

- Understanding phase: This requires thorough understanding of the subject patent by reading one or more technical publications in the field of search. Performing a search on articles by any known authors or applicants can also help to orient the searcher and identify some useful references as a starting point.
- Identify the relevant key words and apply to full-text search: Where the scope is broad, research the topic to narrow the scope with more specific search terms. For example, in a search for chemical engineering reactor, the title can be searched as fluidized bed reactor or a packed bed reactor also. Use an industry standard resource to become familiar with the terms of art (in this case, Perry's Handbook would be a good choice).
- Identify some related patent documents and note some more specific terms related to art in the field.
- Keywords based search: Narrow down the search with the most relevant classes and subclasses from the appropriate classification area(s) of interest. Searches that encompass

US art will benefit from a US class search in that collection, while at least IPC and/or ECLA classes should be used to adequately cover collections from other patent issuing authorities.

- Search all relevant art within each chosen subclass. Review each central reference for additional keywords and structural features that can be used for a search combining keywords as well as relevant classes
- Do full-text searching with more recently identified keywords. Searching can include keywords found from central references, client notes, Examiner suggestions, etc.
- Perform a forward and backward citation search of the relevant references found during the search. It sometimes help in identifying a potentially relevant result.

# CHAPTER 6

## 6. Conclusion

After completion of my internship, I truly realize the significance of patents in the technological world. Various companies, universities as well as individual inventors are speedily moving towards protecting their products and inventions by obtaining IPR on the same. It turns out to be quite beneficial for the owners who invent a new process or a product and get a patent on it. To get a patent one requires a strong idea, which should be novel, non-obvious and should have a utility in the life of the people. It should be useful to mankind and should not harm any life and the sentiments of people. If so, the inventor gets the protection over claims, which are define the scope of the protection. Therefore, a good interpretation of claims is very important for certain searches such as invalidation, FTO or Infringement search. Date criteria is very important for the a patent searcher as it is dependent on the type of search. Also, the type of results given by the searcher varies with the type of search being performed. For patentability search we give the patents and NPL till date. In invalidation we give patents and NPL before the priority or effective filing date of subject patent. In case of infringement we give the products, which are introduced, in the market after the priority or effective filing date of subject patent. Patents can also be given if the client asks for it. For FTO search, only patents are given.

Throughout my training period, I gained in-depth knowledge about the field of patent searching which I am able to apply to my patent searching tasks that are weekly assigned to me.



# CHAPTER 7

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