# COMPREHENSIVE STUDY ON THE ROLES AND RESPONSIBILITIES OF A PATENT RESEARCH ANALYST

A

PROJECT REPORT

Submitted in partial fulfilment of the requirements for the award of degree

of

BACHELOR OF TECHNOLOGY

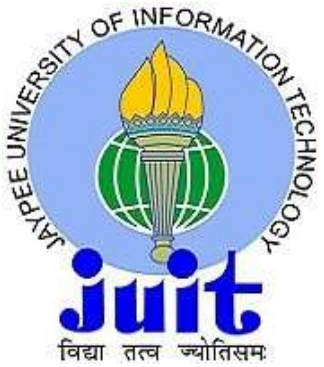
IN

BIOTECHNOLOGY

Submitted by

Jahanvi Singh (211803)

to




DEPARTMENT OF BIOTECHNOLOGY AND BIOINFORMATICS

Jaypee University of Information Technology, Solan

173234, Himachal Pradesh

2025

## DECLARATION

I hereby declare that the work represented in the project report entitled **"Comprehensive study on the roles and responsibilities of a Patent Research Analyst"** submitted towards partial fulfilment of the requirements for the award of the degree of Bachelor of Technology in Biotechnology at Jaypee University of Information Technology, Waknaghat is an original work carried out during my industrial internship at **TT Consultants**.

This report is based on the practical experience I gained under the supervision of **Dr. Neeraj Maurya (Senior Manager)** during my tenure as a **Patent Research Wing (PRW) intern** at TT Consultants, following my placement in the organization.

Prior to this, I undertook a six-month major project at my university under the guidance of **Prof. Dr. Ashok Kumar Nadda**. However, the work presented in this report is independent of the university project and is entirely based on my internship experience.

I further declare that this report has not been submitted elsewhere for the award of any degree or diploma. I take full responsibility for the contents and outcomes of this report.

Jahanvi Singh (211803)

Department of Biotechnology and Bioinformatics

Jaypee University of Information Technology,

Waknaghat, Himachal Pradesh,

India

## CERTIFICATE

This is to certify that the work which is being presented in the project report titled **"Comprehensive study on the roles and responsibilities of a Patent Research Analyst"** submitted in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology in Biotechnology** submitted to the **Department of Biotechnology and Bioinformatics** , Jaypee University of Information Technology, Waknaghat is an authentic record of work carried out by **Jahanvi Singh (211803)** during the period **January 2025 to May 2025** under the supervision of **Dr. Neeraj Maurya (Senior Manager)** and with the guidance from **Mr. Harpreet Singh (Team Lead)** and **Mrs. Harmandeep Kaur Gill (Team Lead)**, following her placement in the organization.

This project is entirely separate from the major project she had been pursuing at the university in her 7th Semester under the guidance of **Prof. Dr. Ashok Kumar Nadda**, and has been accepted as her final major project in light of her placement.

Jahanvi Singh

The above statement made is correct to the best of my knowledge.

**Dr. Neeraj Maurya**
Senior Manager, PRW
TT Consultants

Date: 07/05/2025

**Dr. Ashok Kumar Nadda**
Professor
Department of Biotechnology and Bioinformatics
JUIT, Waknaghat

Date: 23.05.25

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Ref. No: HRD/REC/TTCS/8/2025-26

Date: 06 May 2025

**PROVISIONAL TRAINING LETTER**

TO WHOMSOEVER IT MAY CONCERN

It is to certify that **Jahanvi Singh** (Employee Code: TTCS- 184) is working with Talwar and Talwar Consultants and Services Private Limited since 20 January 2025. Her current designation is **Intern- Patent Research Wing.** The internship is going to be completed on 20 July 2025.

Till now, her performance has been satisfactory. We wish her all the best for future endeavors.

**For Talwar and Talwar Consultants and Services Private Limited,**

Sna Rikhi

Authenticated through Leegality.com
(01JTJFN2C3VJ2C2H3196AP0DDA)
Sna Rikhi
Date: Tue May 06 15:14:44 IST 2025

**Authorized Signatory**

# ACKNOWLEDGEMENT

The successful completion of this project titled “Comprehensive study on the roles and responsibilities of a Patent Research Analyst” owes much to the generous guidance and support of many individuals, for whose contribution I am profoundly thankful.

I would particularly like to express my sincere gratitude to Dr. Neeraj Maurya (Senior Manager) for his invaluable mentorship throughout my internship. His insightful feedback and leadership were instrumental in shaping my work and enabling me to reach clear, well-supported conclusions.

My sincere gratitude also goes to Prof. Dr. Ashok Kumar Nadda, who supervised my previous project at the university. His mentorship provided a strong foundation for my professional journey and continues to significantly influence my growth. I also appreciate Dr. Jata Shankar, Head of the Biotechnology and Bioinformatics Department, for providing me with the opportunity to undertake this project.

I am deeply grateful to my team at TT Consultants for their steadfast support, encouragement, and guidance during my internship, which was crucial for my learning and development.

Finally, I wish to express my deepest appreciation to my parents for their unwavering support, encouragement, and for providing all the necessary resources for the successful completion of this internship.

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# I. 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 the company has worked with the clients to deliver foremost patent prosecution services and patent litigation support like Invalidity/ Validity Searches, Patentability Searches, Patent Drafting etc. We 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.

Our prime focus is to evolve a one stop platform for 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. We are among the top IP firms in India, providing patents services for the last 8 years to a growing list of satisfied clients all over the globe. In our constant pursuit to innovate, we have been able to successfully induct the many systems and tools aimed at providing enhanced quality solutions to our clients.

Patent Services Offered by TTC:

Prior Art Searches: Prior Art Searches in the form of Patentability/ State of the Art Search, Patent Invalidation Search, Freedom to Operate Search, Patent Infringement Search, Structure and Sequence searches. Our 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: Include Technology Landscape & Whitespace Analysis, Competitor Monitoring, Patent Portfolio Management. We transform complex patent data into clear, visual insights, mapping technology landscapes, identifying untapped opportunities (whitespace analysis), and monitoring competitor activities to inform strategic portfolio management. Our dynamic charts offer interactive exploration of all categories.

Patent Prosecution Services: Handled by our partners Talwar Advocates, we offer seamless management of patent and trademark filings in India, along with expert responses to official

communications. Our experiences teams of registered agents and legal staff oversee every step of the process.

Innovative Patent Tools: Developed in-house by our experts, out automated tools like the Invalidator, landscape Viewer, and PAIR Tracking Platform deliver comprehensive results, rivalling the depth of manual analysis for various IP intelligence needs.

# ABSTRACT

Intellectual Property (IP) law establishes exclusive rights for creations of the human mind, encompassing patents for inventions, copyrights for authorship, trademarks for brand identity, and geographical indications for origin-linked goods. These rights incentivize innovation and creativity by granting creators control over their intangible assets, fostering economic growth and protecting consumers. Patents, a key category of IP, protect novel, non-obvious, and industrially applicable inventions for a limited term, offering advantages such as market exclusivity and revenue generation, balanced against costs and potential liabilities.

The patenting process involves specific requirements for novelty, inventive step, and industrial applicability, with certain subject matter deemed non-patentable. Effective patent searching, a systematic and iterative process involving understanding the invention, broad exploration, classification, and citation analysis, is crucial for various IP activities. The project delves into critical intersection of patent searching methodologies and the fundamental principles of patentability within the realm of intellectual property. This project aims to critically analyse the effects of different search strategies, their strengths and limitations, evaluate the impact and coverage of specific patent and non-patent literature databases within the context of determining patentability and understanding the existing technological landscape. This research seeks to provide insights into optimizing the patent search process for accurately determining an invention's novelty and non-obviousness, and for gaining a comprehensive understanding of the prevailing technological landscape.

# INTRODUCTION

1.1Intellectual Property: Intellectual property serves to acknowledge and shield human-made inventions, by granting the creator exclusive rights to them. Intellectual property makes sure that human creativity is protected. By registering their work with patents, copyrights, trademarks, and geographical indicators, IP rights secure a creator's exclusive hold over their assets.

1.2Intellectual Property Rights (IPR): Intellectual Property Rights (IPR) are the legal mechanisms and rules established in order to protect the products of human intelligence and creativity. IPR encompasses a distinct set of regulations designed to protect the outcome of human intellectual endeavours and creativity. These rights grant creators and owners exclusive control over the use and exploitation of their works for a specific period. These rights are conferred upon creators and owners for their works in diverse fields, including industrial, scientific, literary and artistic domains. These works can cover inventions, written materials, software programs, or brand names.

1.2.1Categories of IPR:

Copyright:This is a legal principle, adopted by many nations, that grants the originator of an original work exclusive control over its utilization and dissemination, typically for a defined period. The purpose is to enable creators of intellectual works to receive compensation for their efforts and sustain themselves financially. It safeguards the rights of authors (including composers and writers), arises automatically upon creation, and does not necessitate registration.

Patent: A patent constitutes a set of exclusive rights granted by a government to an inventor or their assignee for a limited duration, in exchange for a comprehensive public disclosure of the invention. An invention is a solution to a particular technical problem, taking the form of a product or a process. The term of a patent is typically 20 years.

Trademark: A trademark is a distinctive symbol, design, or expression that distinguishes the goods or services of one source from those of others. The owner of a trademark can be an individual, a business, or any recognized legal entity. Trademarks can be displayed on packaging labels, vouchers, or the product itself. For corporate branding, they are also often featured on company buildings. Trademarks serve to establish exclusive claims over products or services.

Geographical Indications: These identify goods that possess specific qualities or characteristics attributable to their geographical origin, often linked to factors like soil. They denote a particular region of production that influences the product's quality.

Trade Secret: Having a trade secret gives a business an edge since its formula, practice, process, design, instrument, pattern, or compilation of information is not broadly accessible. In some cases, confidential information refers to these types of details. One idea is that valuable information about leaders of a company, such as the Coca-Cola formula or KFC's secret recipe, is referred to as executive trade secrets and can be protected by law.

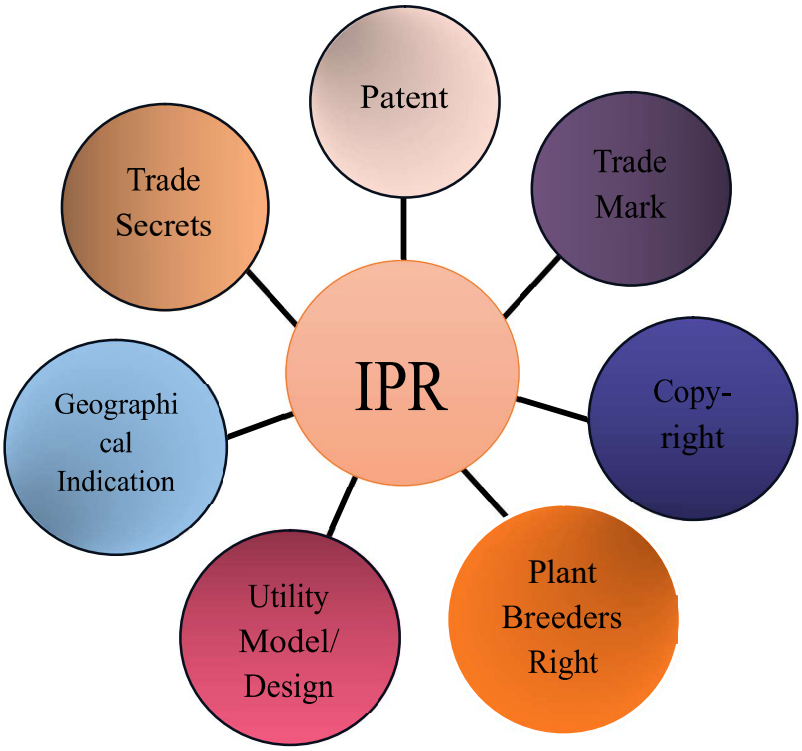



Fig: II.1

1.3PATENTS

The person who comes up with a new, useful, and not-obvious process, machine, product, chemical, or improvement is granted a patent for it. It is awarded to an invention, which could be a new method of doing things or a process or product that provides a better way to address a technical problem. After the grant date, it is valid for 20 years.

Advantages

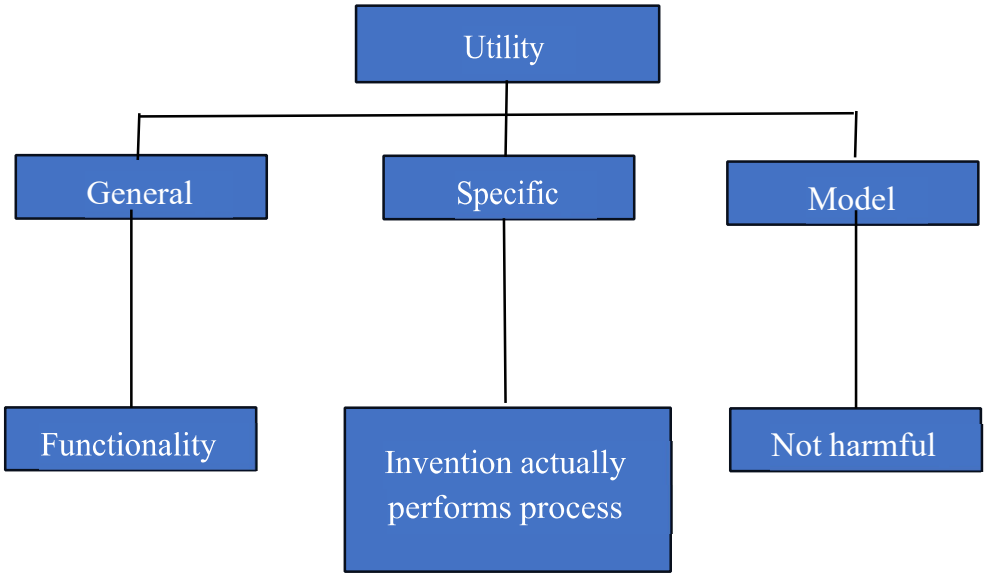
- It keeps other out of the market
- Restricts the competitors
- Generates revenues from license or sale
- Gives your product credibility

Disadvantages

- Cost issue
- Liability

II.3.1 Types of Patents

Utility Patent: A patent that safeguards an invention's functional elements; an invention could be a machine, a process, a manufactured good, or a material composition. It also includes enhancements to preexisting concepts in these areas. If a patent request is made, an inventor will be granted exclusive rights for a period of twenty years as long as the application was submitted.




Design Patent:A design patent protects the decorative appearance of a manufactured product. Chairs, wallpaper, shoes, and jewelry all have designs that are solely centered on aesthetics rather than any practical components. The validity of a design patent is 14 years from the date of issuance.

Plant Patent: Plant patents provide protection for the unique and novel asexually reproducing plant variety. To put it briefly, it was spread through methods other than seeding, like grafting or cutting. A plant patent is protected for 20 years after the application is filed.

II.4 Requirements for Patentability:

Novelty:An invention must be novel in order to qualifyIt must not be shown, in whole or in part, before the date you file the patent application. If an application tries to obtain a patent for prior art that's already covered, the re-patenting will not be granted. As a result, the invention should be unique and unfamiliar.

Inventive Step (Non-Obviousness):The "inventive step," which stipulates that an invention must be sufficiently inventive and not immediately apparent to a person with technical expertise at the time of creation, must be met. In other words, the invention must show a significant improvement over the current state of the art.

Industrial Applicability (Utility): The invention has to be industrially applicable, i.e., that it has at least some practical use and can be made or used by some kind of industry. It has to cater to a human need or a human requirement.

II.5 Non-patentable things: Natural laws, abstract concepts, mental processes, printed materials, computer software, and business practices are among the things that are not deemed patentable. II.6 Parts of Application

- Title
- Abstract
- Field of invention
- Background
- Summary
- Brief Description of drawing
- Detailed description of drawing
- Claims
- Drawing

II.7 Citations

Patent records contain references to earlier prior art.

Background Citations: Patents which make references of prior art

Forward Citations: If some invention is revealed after the patent is granted, the condition does not hold. Mainly useful for patent search.

II.8 Crucial Dates for the Patent Application

- Date of invention: The completion date of an invention.
- Filing Date: On this date, the application must be submitted with all necessary details.
- Priority Date: The earliest day on which an application may be submitted from any location in the world.
- Issue Date: The date the patent is granted by the patent office and patent law, and thus the date it becomes effective.
- Expiration Date: When a patent term expires.
- Publication Date: The date that the general public can access patent-related information. 18 months following the priority date.

# MODULAR DESCRIPTION OF THE JOB

## 2.1 Different Types of Searching

Novelty Search: These searches do not constrain the date when the prior art was performed. It helps if your invention can be patented or not, you are the inventor. All prior date is searched. The patent is registered to the inventor.

Validity Search: You should look for prior art that is most similar to the subject patent's claims. Every claim, not the overall concept or the full patent. Therefore, it means that stories or rumors can be turned down when they are found out to be made up. This lets claims be turned down if it's proven they were just made up. This shows that sometimes, the person filing the patent may not have been the first one to think of the idea. To prove that, the filing date is crucial. It was first thought of by the inventor. It is important to note, though, that we do not cite any earlier work. previous works of art that have already been cited in the subject patent. No need exists.

Infringement Search: If you are accused of infringement, it means an unauthorized activity took place. When patents are concerned, duplicating a patented invention is only allowed if the said invention's holder gives consent. Using a copyrighted work for commercial reasons is considered an infringement in many parts of the world. The claimed benefits and details of what is protected by the patent are provided in the issued patent. A person can only be found guilty of infringement if the patents are valid in that nation, and the product they created matches one or more of the patent's claims. The main objective was to search for products that become available on the market as a result of granted patents.

FTO Search:Searching for patents that have been issued or are pending in order to ascertain whether a product violates any of the claims made in those patents. Additionally, it contains some expired art that may be used as a safe harbor for the process or product to be used in publications under patents.

State of the art Search:This is the current state of the field search. We review the patents for specific technologies. is to offer direction regarding the kind of research being carried out inside the business or organization. Every patent pertaining to the designated technology is searched.

Key Points of Searching:

- The claimed matter is only protected in cases where a patent is in place; in many countries, patents may not have been applied for. Think globally, search locally (for protection), A patent in the US doesn't mean they've protected it everywhere. A patent in the US doesn't automatically stop someone in Japan.
- Different countries have different laws regarding what can be patented, so some may not have granted patents in the countries where applications were submitted.
- If the patent holder has not made the required payments on a regular basis, the issued patents may no longer be valid.
- Check the expiration dates of patents, which are a limited monopoly.
- Some nations have exemptions for specific activities (for instance, New Zealand has an exemption for specific kinds of clinical trials, and Germany is implementing a research exemption).
- One should always check the patent's claim because the wording may vary, which means that aspects considered covered by the patent in one country may not be covered in another.

Databases Operated for Searching:

Conducting thorough patentability and invalidation searches require access to a variety of specialized databases that compile both patent documents and technical literature. These searches serve to determine whether an invention meets the legal standards of novelty and inventive step (patentability), or to identify prior art that may challenge the validity of an existing patent (Invalidation). To achieve comprehensive results, practitioners rely on a mix of publicly available databases, subscription-based commercial platforms, and resources that index non-patent literature.

Publicly Accessible Databases:

Several national and international intellectual property offices offer open-access databases, which are often used as starting points for patent research. For example, Espacenet, Provided by the European Patent Office, offers access to millions of patent publications from around the world, along with tools for filtering by technology classification and publication status. Similarly, USPTO's database provides detailed records of patents and applications filed in the United States. Another key resource is WIPO's PATENTSCOPE, which allows users to explore international applications filed under the Patent Cooperation Treaty (PCT) and includes multilingual search features.

Commercial Patent Databases:

In more advanced patent analysis- particularly in high-stakes invalidation or freedom-to-operate scenarios- subscription-based platforms are often preferred due to their enhanced search capabilities, curated data, and analytical tools. Systems such as Derwent Innovation, Orbit Intelligence, and LexisNexisTotalPatent One integrate global patent data with value-added features. These may include standardized abstracts, comprehensive legal status tracking, patent family grouping and the ability to conduct semantic or citation-based searches.

Non-Patent Literature Databases:

An essential part of any robust prior art search involves reviewing non-patent literature (NPL), which may reveal disclosures not covered in patent filings. Depending on the technical field, databases such as IEEE Xplore, PubMed, ScienceDirect, and Google Scholar may be consulted for journal articles, conference proceedings, or technical reports. Many commercial patent search platforms also offer integration with NPL databases, enabling parallel searching across both domains.

Emerging Tools and AI Integration:

Recent developments in artificial intelligence have led to the creation of next-generation patent search tools. Platforms like The Lens, PQAI, Ambercite use AI algorithms to enhance prior art discovery through techniques such as natural language processing, citation network analysis, and automated relevance scoring.

# PROJECTS UNDERTAKEN

## 3.1 Patentability Search:

To check if your idea is patentable, conducting a patentability search involves looking in the prior art at issued patents, published patent applications, and other published materials. If earlier examples of what you invented are available, you might reconsider trying to patent your idea. Patent Search and Prior Art Search are other terms for a patentability search. Before submitting an application, it helps to do an initial search of patents that are similar to yours. Thanks to this exercise, the examiner is better equipped to find the most related prior art and then describe the invention's novelty in the patent claims.

Part of the initial research, a patentability search can help when drafting an application. Through searching, you can find out how broadly to file for the patent and which pieces of technology to focus on in it.

It takes a substantial amount of time to complete a patentability search. The search time ranges from four hours to twenty hours. It is crucial to understand the important idea of the invention being searched, as they are easier to find among a short collection. Examining a big group of search results will allow the searcher to find any prior art that is connected to the primary idea. After that, the searcher has a chance to check if the selected artwork has any additional significant search features. Sometimes, searching to include alternative embodiment ideas in the patent papers might also be necessary. When an invention is modified by changing its basic and unoriginal parts to illustrate how it could be used with other products or in different situations, it is referred to as alternative embodiments. If the pocket for an MP3 player is sewn into the jacket fabric, it would work the same way as if it could be removed and attached elsewhere.

### 3.1.1 Searching Patent Documents:

A search for patentability typically involves looking through significant patent collections, which typically include the US, European, Japanese, and Patent Cooperation Treaty (WO/PCT) collections. The majority of patent examiners from major patent offices will go directly to these collections, so it makes sense to include them in any patentability search, no matter how quick, even though any previously published document can be used against a patent application. With little time available for patentability investigations, prices can be a challenge, so the main coverage is what

should be prioritized when choosing the search tool. You can find help with many tools, paid and free, described in both US and key international databases.

### 3.1.2 Searching Non-Patent Literature:

Part of a patentability search includes checking non-patent literature. Some of the important written sources that cover a wide variety of technical matters include: You can search through Google Scholar, Google, IEEE Explore (with a subscription), Science Direct, and Wikipedia for your information.

### 3.1.3 Particular Search Techniques:

You can learn about important practices to follow when doing a patentability investigation from these search examples. Besides following the usual search rules, the following steps should be taken.

Never start the search without first talking to the person about the basic direction of the search. Think about whether additional discussions of other arrangements should be looked for or if justright art already answers your questions.

Ask the recipient if they have prepared any claims for the patent application. In this case, it is important to consider if all of the features should be checked in the search, just as an examiner would, upon getting the application. Initial claims may not be included since a patentability search is sometime carried out to find out if more research would be feasible before pursuing the project further.

To determine the inventor's primary research interests, always search for their name. Similar art may have been influenced by or sourced from collaborators and highly cited colleagues.

### 3.1.4 Typical Search Sequence

Getting your Bearings: You should first figure out what you want and need before doing anything else. If you are unsure about the topic, you should usually start with some general reading from technical sources. If the person does not mention anything specific, you can search the web for general materials on the topic. Checking the background information of the inventors or companies involved is another way to obtain useful clues and resources.

Mapping the Territory: A broader search is performed of the entire text of relevant documents to get a feel for how much information is out there. If it's a huge amount, you'll need to refine your focus by using more specific terms.

Finding Related Patents: Examining patent documents can reveal more precise language used by inventors in that area. Identifying keywords and their synonyms to perform more accurate searches.

Zooming in with Classification: The search can be narrowed down by focusing on the most relevant categories and subcategories within patent classification systems. Focusing on US classification systems like IPC or ECLA are essential for searching patents from other countries. Sometimes, talking to a patent examiner can uncover important US subcategories you might have missed.

Deep Dive within Categories: Once you've chosen your categories, you thoroughly search all the relevant documents within each.

Repeating and refining: Using the already learned information to identify even more relevant documents. It's an iterative process of narrowing and expanding.

Exploring Uncharted Categories: After you've exhausted your initial categories, you hadn't considered before, and then repeat the search process within those new categories.

Revisiting the Broad Search: You return to your initial full-text search and use the new keywords you've gathered to search again. If your search tool allows it, you might exclude documents or categories you've already thoroughly reviewed to avoid repetition.

Leveraging All Clues: Searches are conducted further using keywords gleaned from important documents, notes from the person who requested the search, suggestions from examiners, and any other relevant sources.

Following the Footprints: Finally, patents that cite the key documents found (forward citations) and which documents those key patents cited (backward citations). You examine any interesting documents found this way to understand their relevancy to the particular project.

Essentially, a patent search is a methodical process of understanding the invention, broadly exploring the existing information, gradually narrowing your focus using classification systems and the language of the field, and then iteratively refining your search based on the documents you find and the connections between them.

### 3.1.5 Case Study Patentability Search

Initially the information given by the client is present is a limited amount of information. While they didn't reveal the entire invention upfront, they did offer guidance to help us pinpoint relevant references as we explored various databases.

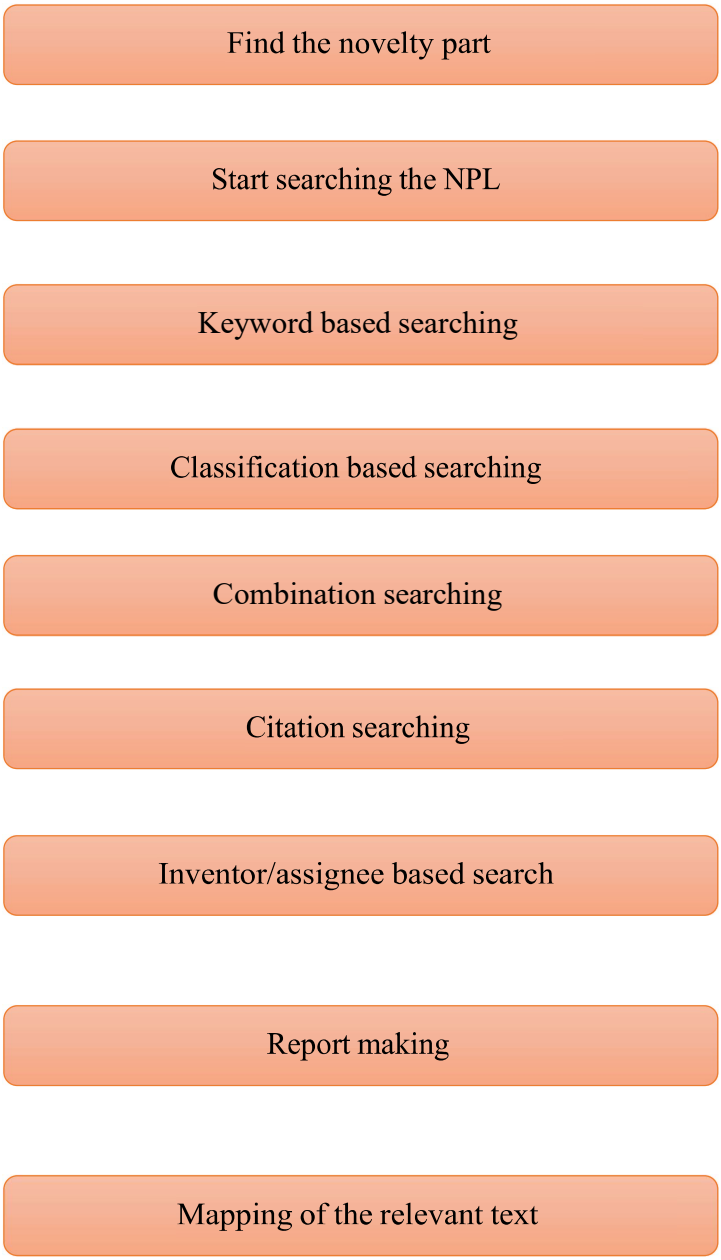
Information given by the client:

A chickpea protein concentration, from legume plant, which is debittered and used as meat or cheese analog in different food products. The protein extraction steps comprises suspension, precipitation and filtration.

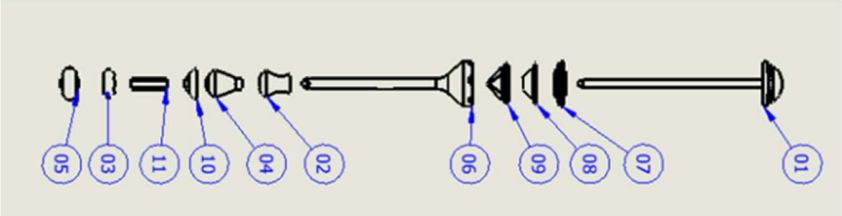
The debittering of protein were achieved by treating slurry with fumaric acid, under the acidic condition, while precipitation of protein were done with the help of alkaline agent like NaOH or KOH.

Search begins

The first step in the search is to identify the novelty of the disclosure. To understand the novelty, a patent analyst needs to read the disclosure's description and background. If they are unable to obtain the novelty, they must discuss it with the inventor; otherwise, the search will not proceed as the inventor intended. Therefore, understanding the disclosure is crucial. Then the real search begins. According to our disclosure, the inventor asserts that the prior art did not include the message's error, which is highlighted by the user's request for retransmission to the system.




NOTE: We generally break the information given by the client into key features, so that it will help us to break the whole invention into parts. The splitting of disclosure makes the invention more understandable.

| | |
|---|---|
| KF 1 | **This project aims to create a low-profile, disposable, affordable surgical device.** |
| KF 2 | **The device is less prone to dislodgement 3mm laparoscopic port that can be used by surgeons who perform minimally invasive procedures in small patients.** |
| KF 3 | **The most interesting and novel way this invention is different from other available products is the novel balloon retention device.** |
| KF 4 |  |

Relevant Citations: US20030225369A1 (Mapped according to key features)

| | |
|---|---|
| Application/ Patent No. | US20030225369A1 |
| Title | Low Profile Transpyloric Jejunostomy System |
| Assignee | Kimberly Clark Co |
| Inventor | Mcmichael Donald J \| Foster Mark Elliott \| Cox Dennis \| Christian Kelly Jay |
| Priority Date | 2002-05-31 |
| Filing Date | 2002-05-31 |
| Family Members | Link to INPADOC Family Member(s) |
| | |
| **Abstract** | |

The present invention relates to a low profile device having a head, a catheter segment, and a retention mechanism. The head of the catheter has at least two openings through which fluid may pass to or from a patient, the head having a low profile relative to a patient when the catheter is properly positioned in the patient. The catheter has at least a first and second lumen, each lumen being in communication with at least one of the openings of the head. The openings in the head of the catheter are designed to allow for the passage of fluid into the catheter and/or out of the patient. The low profile head may contribute to a reduction in the number of removals or displacements of as compared to traditional "on-low profile" apparatus in that the amount or length of the catheter or system which extends external the patients body is significantly less.

**Relevant Text**

**Claims**

**1.A catheter comprising:**

a head, the head comprising at least two openings through which fluid can be injected into or removed from a patient, **the head having a low profile relative to a patient when the catheter is properly positioned in the patient;**

a catheter segment extending from the head, the catheter segment having a proximal end and a distal end, the catheter segment further having at least a first lumen and a second lumen, each of the lumens having a proximal end and a distal end, and each lumen being in communication with at least one of the openings of the head; and

**a retention mechanism attached to the catheter segment at a position between the proximal end and the distal end of the segment.**

**5. The catheter of claim 1, wherein the retention mechanism is a balloon.**

**6. The catheter of claim 5, the balloon consists of a sleeve with a first end that remains attached to the catheter segment so as to create a first cuff and a second end that attaches to the catheter segment to create a second cuff, allowing the balloon to collapse over the catheter segment when not inflated, making it easier to either insert or remove the catheter through the stoma.**

**Description:**

In response to the difficulties and problems discussed above, a new low profile catheter has been developed. **The present invention relates to a catheter or system for providing nutrition and/or medication to a patient whose stomach function is inhibited or nonfunctional.More particularly, the present invention relates to feeding tubes or feeding devices, such as transpyloric feeding tubes**

**and the like, which are adapted to enable the provision of nutrition and/or medicine directly into the patient's jejunum** where the patient is experiencing a nonfunctioning or impaired stomach and/or difficulties swallowing, chewing or the like. The devices contemplated by the present invention may also permit nutrients to be placed directly into a patient's stomach and/or into the patient's jejunum. As noted above, this may be necessary when a patient has a disorder of the gastrointestinal tract, malabsorption (impaired absorption of nutrients, vitamins or minerals from the diet by the lining of the small intestine), or neurological or renal disorders.

**More specifically one aspect of the present invention relates to a catheter having a head, a catheter segment, and a retention mechanism.The head of the catheter has at least two openings through which fluid (including gases) may pass to or from a patient,the head having a low profile relative to a patient when the catheter is properly positioned in the patient.**The catheter segment extends from the head of the catheter and has a proximal end and a distal end. The catheter has at least a first and second lumen, each lumen being in communication with at least one of the openings of the head. The openings in the head of the catheter are designed to allow for the passage of fluid, including fluids with solids, into the catheter and/or out of the patient. **The low profile head may contribute to a reduction in the number of accidental removals or displacements of the feeding tubes or systems as compared to traditional "nonlow profile" apparatus in that the amount or length of the catheter or system which extends external the patient's body is significantly less.**Additionally, the improved cosmetic appearance of a low profile system or device is desirable for many patients, especially those who are ambulatory and/or those individuals who would like to be able to conceal the fact that they have an enteral feeding tube.

**In one of the embodiments of the present invention, the retention mechanism may be a balloon. Specifically, The balloon can be shaped by a sleeve with one end hooked to the catheter part to create a first cuff and the other end to create a second cuff, so that the balloon will shrink and lie on the catheter segment when deflated.**

| S. No. | Queries | Database | No. of Hits |
|---|---|---|---|
| 1. | (("CHICKPEA" OR "CHICK PEA" OR "GRAM PEA" OR "CICER ARIETINUM" OR "BENGAL GRAM" OR GARBANZO | | |

| | | | |
|---|---|---|---|
| | OR “EGYPTIAN PEA” OR CICER) 8D (PROTEIN) 8D (CONCENTRAT+ OR EXTRACT+ OR SUPPLEMENT+ OR ADDITIV+ OR FLOUR+ OR PRODUCT+ OR FOOD????))/TI/AB/CLMS AND ((“FUMARIC ACID” OR “C4H4OH” OR “TRANS-BUTENEDIOIC ACID”) P ((REMOV+ OR EXTRACT+ OR DISCARD+ OR TREAT+ OR SEPARAT+ OR ELIMINAT+ OR WASH+ OR WITHDRAW+) 10D (BITTER+ OR TART+ OR TANG+ OR SOUR+ OR SAPONIN+ OR PHYTIC) 15D (PROTEIN)))/TI/AB/CLMS/TX AND ((A23J03/227 OR A23L27/26))/IPC/CPC | ORBIT | **203/408** |
| 2. | ((MEAT OR PORK OR BEEF OR CHEESE OR LAMB) 9D (PROTEIN) 12D (ANALOG?? OR ANALOUGE OR SUPPLEMENT+ OR SUBSTITUT+))/TI/AB/CLMS/TX AND (ACID+) 10D (FUMARIC OR OR “C4H4OH” OR “TRANS-BUTENEDIOIC ACID”) AND ((ALKALI????) P (“KOH” OR “NAOH” OR “POTTASIUM HYDROXIDE” OR “SODIUM HYDROXIDE”)) AND ((DISTILLATION?? ORBIT 236/663 39 OR “NANOFILTRATION” OR “ULTRAFILTRATION” OR “DIAFILTRATION” OR “EVAPORATION”) P (FILTER+ OR SEPARAT+ OR EXTRACT+ OR | ORBIT | **236/663** |

| | | | |
|---|---|---|---|
| | PRECIPIT+ OR CONCENTRAT+ OR TREAT+ OR WASH+)) TI/AB/CLMS/ AND (A23J-03/140 OR A23L-11/000) | | |

**NPL Queries**

| S. No. | Queries | Database |
|---|---|---|
| 1. | (CHICKPEA OR "GRAM PEA" OR GARBANZO) (PROTEIN) (CONCENTRATE) ("FOOD PRODUCT") (MEAT OR CHEESE) (ANALOG OR SUBSTITUTE) | GOOGLE, GOOGLE SCHOLAR, IEEE EXPLORE, SCIENCE DIRECT |
| 2. | (METHOD OR STEP OR PROCEDURE OR TECHNIQUE OR PROCESS) (LEGUME OR "LENTIL") (PROTEIN) ("FUMARIC ACID") (DEBITTER OR DETOXIC) (FILTERATION) (PHYTIC OR SAPONIN) (""NaOH OR "KaOH") | GOOGLE, GOOGLE SCHOLAR, IEEE EXPLORE, SCIENCE DIRECT |

| Classification | Definition |
|---|---|
| **A23L-02/726** | Meat flavors |
| **A23J-03/227** | Meat like texture food |
| **A23J-03/014** | Vegetable proteins |

**Keywords:**

| Additive | Distillation | Lentil | Separate | Alkaline | Egyptian Pea | Meat |
|---|---|---|---|---|---|---|
| Sodium Hydroxide | Analog | Eliminate | Method | Sour | Beef | Evaporation |
| Extract | Phytic | NaOH | System | KOH | Product | Step |
| Bitter | Fabaceae | Pork | Meat | Diafiltration | Procedure | Substitute |
| Filter | Pork | System | Procedure | Technique | Technology | Supplement |
| C4H4OH | Cheese | Chickpea | Food | Precipitate | Tart | Tang |

3.2 Invalidation Search:

Such a search aims to find any related patents from the past that could prove a granted patent is invalid. They give you prior art citations, a breakdown of the claims in a chart, and a search report. Results from searches can prioritize due diligence, help evaluate a patent, or rule that a patent in question was not valid during an infringement trial. 41. A client checks the validity and invalidity of a patent if he is unsure that his product does not violate the rights of someone else's patent. For the patentee, searching is vital for the growth and protection of the business. A firm can initiate a search for invalidating a patent if it thinks their idea is violating a patent, if its product is similar to another's patent, or if another company is looking to find evidence that can make the claims in a patent questionable and work to have it invalidated. The aim is to discover prior art or previous use, which affects the content of the granted patent. A group of proficient experts undertakes an in-depth search called the invalidation search to try and nullify patents.

Assessing claims as you do a validity search is very important. As most art is not found among the reviewed and approved patents, the claims should be explained broadly so you can search for other similar patents. The searcher should try to expand the understanding of the claims as much as possible. It is important to check with the search requester and give them clarity regarding the finding. Even when art does not appear to refute claims straight away, it may still form a key part of an argument disputing them in a court case.

A thorough grasp of the state of the technology industry today, along with some ingenuity in identifying similar technologies that might also fall under the claim limitations, are typically necessary for effectively defining the scope of a validity search. In order to help the user reach the most comprehensive interpretation, a step in the specific provides an example of breaking down a claim into its specific limitations. However, it is important to emphasize that the search requester (a patent attorney) should also discuss and agree upon the interpretation of the claims before the search begins. When conducting a patent search, it is best to consult an attorney as much as possible and assign them the responsibility of interpreting any claims that are found. Another consideration in validity searching is the search cut-off date; ideally, the searcher and search recipient will agree on this important date. Stated differently, the search cut-off date should include any prior art that might cast doubt on the subject patent's validity. This date will be set by the national laws of the nation where the patent in question is issued. Due to a number of legal factors, a legal expert must always determine the cut-off date for a validity search.

It is also helpful to look at the patent's prosecution history, which is known as a "file history." All the letters, forms, and communications between the applicant and patent office are kept in the prosecution history. The search report created by the examiner can give the searcher a good starting pointMost patents likewise have a legal statement by the examiner (Called Reason for Allowance in the US) explaining how features of the claim ensure that it qualifies for a patent despite similarities to other knowledge. Even so, using what's lacking in previous patents to check your validity reviews can be useful, but you should still leave specific details and reviews to a licensed patent attorney. It can be tricky to find the prosecution history for a patent. Viewing the latest records from US patent prosecution can now be done in Public PAIR, an online service at the USPTO. In some cases, you may need to request records from a prosecution history service, and the service will take care of getting and copying them in person. You may be able to look up recent prosecution history through online PDF Image File Wrappers (IFWs).It is also possible to search for similar data online at the EU Register Plus page using the European Patent Office (EPO). Understand that not every case is included in the database. It can also be tough if you have to review patents in other offices since you can need their prosecution history. A few patent offices do not allow people to make copies of prosecution files, but they do permit inspection on site. A shortage of room in certain patent offices can lead to their records being lost. The availability of this resource relies on the year the patent was filed and the body that issued it.

Searching Patent Documents

Every type of prior art that could have led to the initial patent application being denied should be considered during a validity search. Still, a lawyer working in the field of patents should always decide on the "search cut-off date" since it is somewhat complicated to decide which information can be used against a patent claim. The free USPTO EAST system in Alexandria, Virginia, and the majority of commercial patent search tools will meet these requirements; however, users should keep in mind that the more thorough the coverage, the better the search. Although they shouldn't be used as primary sources, free resources like Google Patents and the EPO's espacenet can be helpful supplementary sources of information, such as for downloading patent PDFs for free. Selecting a data source that contains a comprehensive collection of US full text patent data is highly recommended for validity searching in older technologies, particularly the mechanical arts. A contemporary concept in the mechanical arts may actually have been published in the patent literature much earlier than 1976.Google Patent Search, Thomson Innovation, LexisNexis TotalPatent, and Micro Patent PatentWeb are a few examples

of resources that provide extensive US full text backfile data. Citation searching is a helpful tool for any search, but the examiner should always look into the patent art cited first because a validity search always starts with an issued patent. The searcher should attempt to get a sense of the closest art found during the initial search in order to distinguish which claim limitations were found and which were not by the examiner. The patent will be able to issue as a result. (Whenever feasible, the patent file history should be reviewed in order to comprehend the rationale behind the allowance. Public PAIR can be used for US patents, and the EPO's Register Plus service can be used for EP patents.)

A full-text patent search tool for validity searching should include these essential parts:

- Maximum quality data
- Maximum backfile data
- Effective citation search tools
- The option to refine the search by date using publication, application, or priority date

Looking Through Non-Patent Works

Any document published prior to the search cut-off date must be included in the non-patent literature search as part of a validity search. (Because of the intricate legal issues)

It is important for a patent lawyer to determine which details can stop the approval of a patent claim.) Every best practices article for each field of technology includes a list of helpful non-patent sources. This kind of comprehensive search can find important earlier works in detailed collections as well as in single journals, books, and websites.

The following are some important non-patent literature sources covering a wide range of technical subject areas:

- Google Scholar (free),
- Google (free),
- IEEE Explore (subscription),
- Science Direct (free),
- Wikipedia (free)

Specific Search Strategies:

These search tactics serve as illustrations of particular best practices that can be used when conducting an infringement search. In addition to being accepted, these actions must be taken.general search procedures that are applicable to every search.

1. Create distinct search features for each of the claims' limitations.
2. Determine the different limitations that are probably the hardest to locate in the prior art by speaking with the search recipient. Typically, the searcher needs to make sure that all of the limitations of the chosen claims are covered by the 45 search features. But by dissecting the claim into its constituent elements, it will be simpler to locate specific parts of the claim rather than the full one.
3. Together with the search recipient, determine and explain the most expansive reasonable interpretation of claim limitations. A patent lawyer should always be consulted during a validity search, and claims should always be interpreted as broadly as possible. this procedure. For searchers to completely comprehend what to include and exclude in the search results, this step is essential.
4. Determine keywords from the patent's claims. For the patents she drafts, a patent drafter serves as a lexicographer. She is free to choose which words to emphasize and use. Conversely, she might refrain from using words that she views as less significant.
5. Choosing keywords according to the patent drafter's area of interest is a clever method to begin an invalidity search. In most cases, a patent drafter together with the person making the search request, decide on a cutoff date. This date should always be established by a patent because there are several legal nuances involved in figuring out what qualifies as prior art and can be used to contest validity. Three to five years following the subject patent's filing date is a typical range.
6. Examine the subject patent's file history if at all possible. One resource that can offer the validity searcher additional support and helpful hints is the patent prosecution. First off, the prosecution history frequently includes the examiner's initial search report, which includes the search field and pertinent results discovered during the search. Second, the following two questions can be partially addressed by the prosecution history.

   Typical Search Sequence:

1. Identify the search. This usually means you need to look at some technical documents related to the subject area you don’t know much about. If the person who requested the search has

no ideas, you can try doing a web search on the general topic to see what you can find about the resources.

2. To gauge the state of the art, a full-text search. When the scope is too broad, look into the topic to narrow it down.
3. Go through patent documents to discover more accurate words used in the field. Silica is an inert media that can be found in packed bed reactors, and it may be talked about in a description of these reactors. Yet, various types of inert materials, like silica, are used in this type of reactor. Look for what else lives in the ecosystem and incorporate those names as extra search terms if it makes sense.)
4. Start with the classes and subclasses that relate to your subject or the main area of study. As IPC and ECLA classes usually include most patent issues from other authorities, searching for US references is recommended for patentability in the US.
5. Examine each relevant work of art in the chosen subclass. Look for additional structural components and keywords in each central reference that can be used to modify the body of the full-text search in (3).
6. Repeat steps (4) and (5) to locate additional references.
7. Examine crucial central references for classes and subclasses that weren't initially considered after (6) has been exhausted. For every extra subclass, repeat.
8. Go back to the full-text search body and look for keywords that have been discovered more recently. Exclude search terms or subclasses that have already undergone a thorough review if the search engine allows it.
9. Use keywords from central references, client notes, examiner recommendations, etc. to search the remaining body of work.
10. Search for citations both forward and backward on each database.

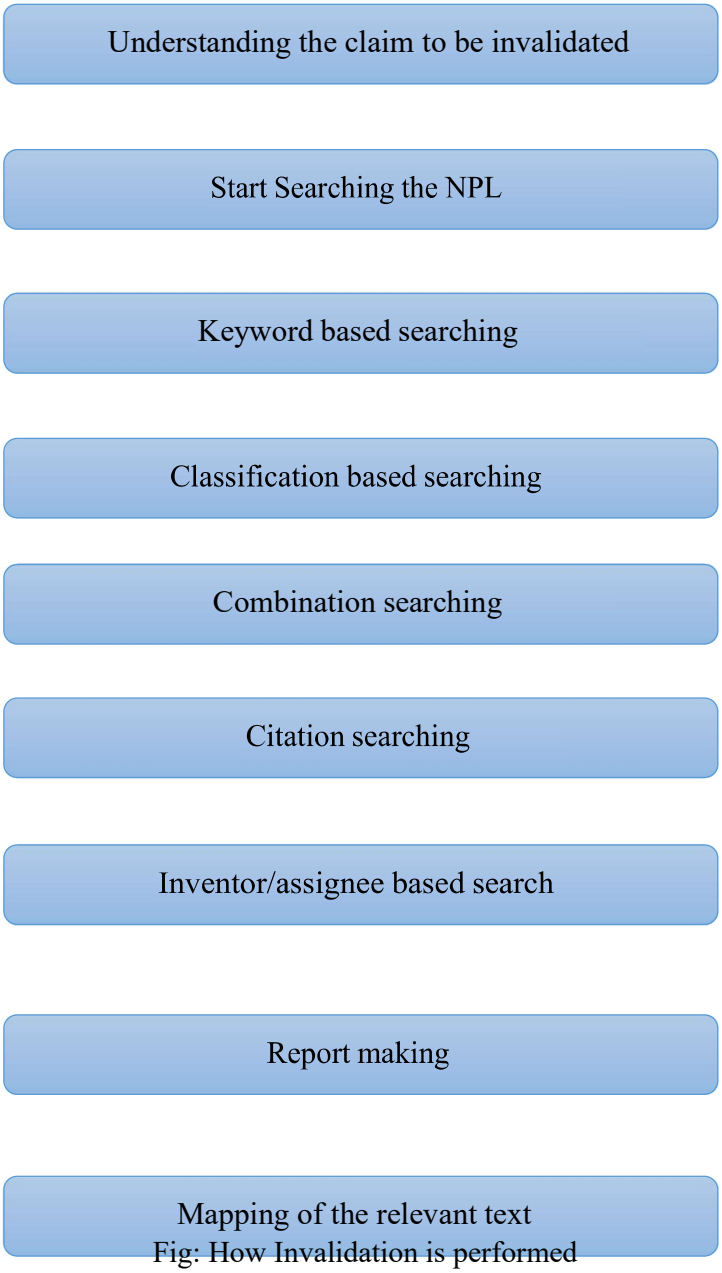


Fig: How Invalidation is performed

## 3.3 Landscape Searching

A landscape search is an extensive analysis of the existing patent environment within a specific technical field. This search identifies active and expired patents, applications, and relevant nonpatent literature (NPL) that illustrate innovation trends, key players, technological gaps in a domain. The output of a landscape search typically includes a searchable database, analytical charts and graphs and an annotated bibliography of key patents. This search helps stakeholders make informed business, research, investment and R&D decisions.

From a business perspective, landscape searches are vital during strategic planning phases. When a company intends to enter a new market, invest in a technology, or develop a new product line, a landscape search enables them to understand the competitive environment. The aim of a landscape search is not to determine patentability or validity, but to map out the innovation terrain- highlighting which organizations are filing in a field, which technologies dominate the space, and which areas remain underexplored. It allows clients to identify opportunities for innovation, licensing, or collaboration as well as avoid crowded or litigious fields.

A well-conducted landscape search requires an in-depth understanding of the technical field and the ability to construct broad, and inclusive queries to capture variations in terminology, applications, and inventor behaviour. Unlike validity or FTO searches that target specific claims or documents, landscape searches operate across broader thematic criteria. Therefore, search queries are typically constructed using combinations of keywords, classifications, assignee/inventor names, and priority dates.

Patent classification codes (such as IPC, CPC, or ECLA) play a central role in constructing a comprehensive search. Understanding the evolution of technology classes over time is critical, as older documents may be classified differently from recent ones. Similarly, keyword variation across time and geography must be addressed using synonym and terminology expansion strategiesLandscape searches often cover global patent databases. Commercial tools like Derwent Innovation Orbit, PatSnap, and Innography are preferred for their advanced analytics and data visualization capabilities. Free tools like Espacenet, Google Patents, and WIPO Patentscope can supplement the core search but may lack advanced analytic function.

Prosecution History and Legal Status:

Though not the primary focus, understanding the legal status of key patents (granted, expired, opposed, revoked, etc.) can add important insights into the competitiveness of a technology space. Similarly, examining prosecution timelines can indicate which technologies faced greater scrutiny and which claims may have broader or narrower scope. These elements can help refine competitive positioning or risk assessments.

Searching Patent Documents:

For a robust landscape search, both global bibliographic and full-text patent data are essential. The search must include patent applications, granted patents, utility models, and sometimes design patents, depending on the industry. Priority is given to tools that allow:

- Filtering by classification codes, publication dates, or jurisdictions
- Mapping assignee activity over time
- Tracking inventor collaborations and citation networks
- Exporting large datasets for offline analysis

Typical tools used for such purposes include:

- Derwent Innovation (Clarivate) – for enhanced patent families and analytics
- Orbit Intelligence (Questel) – for visualizations and legal status insights
- PatSnap – for business intelligence integration with IP data  LexisNexis PatentSight – for IP portfolio strength analytics

Including Non-Patent Literature:

Non-patent literature (NPL) is an essential addition to a landscape search since patent documents might not adequately represent cutting-edge or fundamental science. Whitepapers, industry reports, technical conference proceedings, scientific journals, and standards documentation offer a more comprehensive understanding of the development of the field.

Major sources of NPL include:

- IEEE Xplore
- ScienceDirect
- Google Scholar
- SpringerLink

- arXiv
- Technical blogs and government reports

These sources can be especially useful for identifying technology developments that have yet to be patented or for exploring complementary scientific fields.

Search Strategy and Sequence:

Define the Objective: Clarify the purpose—whether it's competitive intelligence, white space analysis, R&D scouting, or technology forecasting.

Identify Keywords & Classifications: Extract terminology from existing patents, standards, and literature. Use synonym expansion and identify applicable IPC/CPC classes.

Build Broad Search Queries: Construct queries to include multiple combinations of keywords and classifications. Include Boolean logic and truncation where necessary.

Search by Applicant/Assignee: Identify major players in the domain and examine their portfolios.

Temporal Analysis: Use publication dates, priority dates, and application dates to track technology evolution.

Citation Analysis: Identify influential patents through forward and backward citation mapping.

Geographical Filtering: Understand regional innovation trends—this is especially relevant when comparing jurisdictions like US, EP, CN, KR, JP, and IN.

Legal Status Review: Evaluate the enforceability and strength of key patents.

Visualization and Reporting: Use dashboards or visual analytics to summarize trends, top players, filing spikes, and gaps.

Refinement and Feedback Loop: Iterate with the client or IP counsel to refine search parameters and highlight actionable insights.

Deliverables:

A comprehensive landscape search package could consist of:

- A spreadsheet or organized database of pertinent patents
- Graphical representations (such as technology clusters, top assignees, and patenting trends over time)

- A summary report that highlights important discoveries and tactical possibilities • Optional slide decks for investor or business presentations

# CONCLUSION

The functions of design and plant patents, the fundamental conditions for patentability, and the format and procedure of carrying out different patent searches have all been highlighted in this project's thorough review of important facets of the patent system. We have obtained a useful grasp of what constitutes a legally protectable invention by examining the differences between patent types and the strict requirements for patentability—novelty, inventive step, and industrial applicability.

A real-world case study was used to illustrate the significance of comprehending invention disclosure and methodically dissecting its essential components. This project also covered the procedures and tactical factors involved in carrying out a patentability search. Examining the various kinds of patent searches—novelty, infringement, FTO, validity, and state-of-the-art—showcases how important patent intelligence is for managing innovation, reducing legal risk, and making strategic decisions. Additionally, the integration of non-patent literature, the use of specialized databases, and the emergence of AI-based tools demonstrate how technology is revolutionizing contemporary patent analysis.

In summary, the project not only highlights the legal and technical complexities of the patent process, but it also strengthens the critical thinking and methodical approach necessary for efficient patent search and analysis. The knowledge and abilities gained here are crucial for fostering innovation in a cutthroat international marketplace.

# FUTURE SCOPES

There are many chances to expand on this seminal work as the field of intellectual property continues to develop, particularly in tandem with technological advancements. Deeper integration of machine learning and artificial intelligence in patent searching is one encouraging avenue. These technologies may be used in future advancements to automate prior art detection, conduct semantic search, and even help with claim drafting. Furthermore, for those working on cross-border innovations, broadening the focus to encompass international patent systems will be crucial. Global patent strategy can be improved by comparing the filing processes and patentability requirements of various jurisdictions, including China, Japan, and the European Union.

Lastly, creating tools for patent simulation and visualization, particularly for design patents, may improve innovation communication and support IP enforcement. The way that designs are displayed and assessed may change as a result of platforms that incorporate CAD models or augmented reality. Creating a carefully chosen, searchable knowledge base of previous patent searches, case studies with annotations, and best practices would be beneficial in the long run for researchers, lawyers, and inventors. These future directions suggest that intellectual property management will become more dynamic, data-driven, and globally conscious.

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