

PRIOR-ART SEARCH ANALYSIS

Project report submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

By

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UNDER THE GUIDANCE OF

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Experience Certificate

Date: May 15th, 2023

Ref. No: GB/HR-OPS/JRA-273

This is to certify that Zeeshan Naseem is interning with GreyB as a **Trainee – Research Analyst** from Feb 2023 to ongoing.

During his tenure with us, we found him to be hardworking and very productive.

This letter testifies his successful completion of internship.

With Best Wishes

For GreyB Research Pvt. Ltd.

Yours sincerely,

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TABLE OF CONTENTS

CAPTION	PAGE NO.
DECLARATION	i
ACKNOWLEDGEMENT	ii
LIST OF ACRONYMS AND ABBREVIATIONS	iii
LIST OF FIGURES	iv
ABSTRACT	v
CHAPTER-1: PROFILE OF THE COMPANY	1
1.1 ABOUT GREYB SERVICES	1
1.2 GOAL	1
1.3 TEAM WORK AT GREYB	2
1.4 WORK CULTURE AT GREYB	2
CHAPTER-2: INTELLECTUAL PROPERTY	3
2.1 WHAT IS INTELLECTUAL PROPERTY?	3
2.2 TYPES OF INTELLECTUAL PROPERTY	4
CHAPTER-3: PATENTS	5
3.1 WHAT IS A PATENT?	5
3.2 TYPES OF PATENTS ISSUED BY THE USPTO	5
3.3 PURPOSE OF GRANTING PATENTS	6
3.4 WHY CHOOSE PATENTS?	6
3.5 LEGAL REQUIREMENTS FOR PATENTABILITY	8
3.5.1 NOVELTY	8
3.5.2 UTILITY OR INDUSTRIAL APPLICABILITY	8
3.5.3 INVENTIVE MOVE / NOT COMMON STEP	9
3.6 PATENT PROSECUTION	9
3.6.1 RESTRICTIONS	10
3.6.2 OFFICE ACTION	10
3.6.3 APPLICANT'S REPLY	10
3.6.4 FINAL REJECTION	11

3.6.5	NATURE OF PATENT AND PATENT RIGHTS	12
3.7	ELEMENTS OF A PATENT APPLICATION	13
3.8	HOW PATENTS LOOK LIKE?	16
3.9	IMPORTANT DATE TYPES FOR A PATENT	16
3.10	FILE WRAPPER ANALYSIS	17
3.10.1	HOW TO PERFORM FILE WRAPPER ANALYSIS?	18
3.10.2	IMPORTANT SECTIONS IN THE FILE WRAPPER ANALYSIS	18
CHAPTER-4:	SEARCHES CONDUCTED AT GREYB	20
4.1	TYPES OF SEARCHES	20
4.1.1	PRIOR ART SEARCH	20
4.1.2	LANDSCAPE SEARCH	22
4.1.3	INFRINGEMENT SEARCH	22
CHAPTER-5:	PRIOR ART ANALYSIS	23
5.1	WHAT CAN BE A PRIOR ART?	23
5.1.1	ANY PUBLICATION	23
5.1.2	ANY MATERIAL AVAILABLE TO PUBLIC	23
5.1.3	MAKING AVAILABLE AND EXHIBITION OF PRODUCTS	24
5.1.4	ENABLING DISCLOSURE	24
5.1.5	SOME UNCONVENTIONAL PRIOR ART	25
5.2	HOW IS PRIOR ART USED?	26
5.3	PATENT SEARCH	27
5.4	PATENT CLASSIFICATION SYSTEM	27
5.5	CONDUCTING A PATENT SEARCH	28
5.5.1	STRATEGIES FOR STRING GENERATION	28
5.6	DATABASES FOR PATENT SEARCH	29
CHAPTER-6:	PROJECT WORK	30
6.1	NON DISCLOSURE AGREEMENT	30
6.2	LIST OF PROJECTS	30
6.3	TRANSPORT FORMAT SELECTION	30
6.3.1	OBJECTIVE OF THE PROJECT	30
6.3.2	TECHNOLOGY DESCRIPTION	30

6.3.3 STRATEGIES USED FOR INVALIDATION	31
6.3.4 CONCLUSION OF THE PROJECT	32
6.4 USB HUB DEVICE	32
6.4.1 OBJECTIVE OF THE PROJECT	32
6.4.2 TECHNOLOGY DESCRIPTION	32
6.4.3 STRATEGIES USED FOR INVALIDATION	33
6.4.4 CONCLUSION OF THE PROJECT	34
6.5 NETWORK TYPE DETERMINATION	34
6.5.1 OBJECTIVE OF THE PROJECT	34
6.5.2 TECHNOLOGY DESCRIPTION	34
6.5.3 STRATEGIES USED FOR VALIDITY CHECK	34
6.5.4 CONCLUSION OF THE PROJECT	35
CHAPTER-7: CONCLUSION	36
REFERENCES	
PLAGIARISM REPORT	

DECLARATION

I hereby declare that the work reported in the B. Tech Project Report entitled “**Prior-Art Search Analysis**” submitted at the **Jaypee University of Information Technology, Wagnaghat, India** is an authentic record of my work carried out under the supervision of **Dr. Pardeep Garg** and **Mrs. Avantika Sharma**. I have not submitted this work elsewhere for any other degree or diploma.

Zeeshan Naseem
191011

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

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Date:



Mrs. Avantika Sharma
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GreyB Services, Mohali
Date: *May 11, 2023*

Head of the Department/Project Coordinator

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Zeeshan Naseem (191011)

LIST OF ACRONYMS AND ABBREVIATIONS

IP	Intellectual Property
IT	Information Technology
USPTO	United States Patents and Trademark Office
R&D	Research and Development
USC	United States Code
ISR	International Search Report
IPR	International Patent Rights
IPC	International Patent Classification
CPC	Cooperative Patent Classification
JRA	Junior Research Analyst
3GPP	Third Generation Partnership Project
WCDMA	Wideband Code Division Multiple Access
MAC	Medium Access Control
MAC-e	Enhanced Medium Access Control
SEP	Standard Essential Patent
CR	Change Request
USB	Universal Serial Bus
GSM	Global System for Mobile Communication
CDMA	Code Division Multiple Access
GPRS	General Packet Radio Services
LTE	Long Term Evolution
UMTS	Universal Mobile Telecommunication Service
WiMAX	Worldwide Interoperability for Microwave Access
5G/NR	Fifth Generation/ New Radio
UE	User Equipment

LIST OF FIGURES

Figure 2.1	Intellectual Property
Figure 3.1	Front Page of a US Patent
Figure 5.1	A scene from the Donald Duck Comic
Figure 6.1	MAC-e Structure
Figure 6.2	Internal structure of USB hub

ABSTRACT

In this report, we aim to provide you with a comprehensive guide on how to conduct an effective prior art search for your patent. It is crucial that you assess the novelty and inventiveness of your invention while also identifying any relevant prior art references that might impact its validity before submitting your application. By outlining our step-by-step methodology for conducting this type of research which includes strategies for searching various types of databases we hope you can properly organize your efforts towards finding the most pertinent information possible. We will discuss some common techniques used when searching for such material such as keyword-based searches, classification-based searches, and citation analysis among others- ultimately leading us towards understanding better how important it is at all times when it comes down not just focusing domestically but also internationally if necessary so there are no missed opportunities.

CHAPTER 1

PROFILE OF THE COMPANY

1.1 ABOUT GREYB SERVICES

GreyB Services - a leading technology research and consulting organization - specializes in offering bespoke solutions to its esteemed clients across varied industries. Since its inception in 2007 it has been headquartered in Singapore with additional offices located at Mohali, Punjab India; complementing its wide range of services including but not limited to market research competitive intelligence analysis alongside patent research & intellectual property (IP) consultancy - amongst others. With core competencies revolving around data analysis coupled with excellent technological know-how; GreyB is aptly placed to provide insightful analyses culminating into sound recommendations that help its clients make prudent business decisions towards maximizing profits/returns on investment(s). Its client base comprises Fortune 500 companies as well as law firms - all drawn from different sectors who have come to trust GreyBs exceptional service delivery.

Notably, GreyB Services has a team of professionals that includes engineers, data scientists, and analysts with various educational backgrounds and expertise drawn from diverse areas. GreyBs market research proposition empowers companies to understand their markets better while the competitive intelligence service helps clients understand the strategies adopted by competitors in addition to their strengths and weaknesses.

Equally important the patent research services offered by GreyB Services assist clients in finding and evaluating patents or patent applications within their specialized domains. The company's IP consulting services assist customers in managing the complex world of intellectual property. They offer support through patent prosecution, licensing, and litigation.

Overall, GreyB Services is a trusted partner for businesses and organizations looking to leverage technology and data to gain a competitive edge. With its expertise and commitment to quality, GreyB Services is poised to continue its growth and success in the years to come.

1.2 GOAL

GreyB Services specializes in creating tailored research and patent appraisals to aid clients in making well-informed decisions concerning their research investments. The firm's highly qualified team of

researchers has extensive experience across several sectors including IT, industrial equipment, material sciences software development advanced technologies consumer goods bioengineering medical devices chemical sciences petroleum & gas chemistry medical equipment healthcare industrial production, and microelectronics. With this expansive range of expertise available to them, GreyB Services provides comprehensive guidance and analysis that caters specifically to each client's needs.

1.3 TEAMWORK AT GREYB

With a task delivery process that puts user-friendliness at the forefront, GreyB Services boasts a specialized team devoted to enhancing data collection execution. The company's primary objective circles around conducting comprehensive assessments of customer aim and queries to determine product fit and review efficiency. Through an amalgamation of consumer engagement, project-based analytical testing, as well as meticulous attention paid toward item efficacy itself; clients receive unparalleled service from this industry leader. Furthermore, due to the personalized mentorship provided by its core unit learning becomes efficient; prompt client deliveries are just another aspect where GreyB services excel.

1.4 WORK CULTURE AT GREYB

For GreyB Services, fostering a relationship built upon mutual trust with our clients remains at the forefront. We maintain an unwavering level of devotion when it comes to executing search assignments - driven by the strong working relationships we have established over time. We do request that clients recognize how pricing and certain criteria can impact the outcome of their search results as they engage us for our wide-ranging IP information search services which are designed in response to their unique needs. Leveraging expertise in integrating information search capabilities with technical backgrounds and patent knowledge across an array of technical domains sets us apart from others. Our main areas of work include:

- Patent Searches
- Patent Litigation
- Patent Analytics
- IP Asset Management
- Patent Drafting
- Innovation Management

CHAPTER 2

INTELLECTUAL PROPERTY

2.1 WHAT IS INTELLECTUAL PROPERTY?

The IP deals with patents, trademarks, copyrights, design rights, and other kinds of intangible assets. Such assets emerge in their truest sense mostly from creative works. Such assets do not have any physical reality, as well.

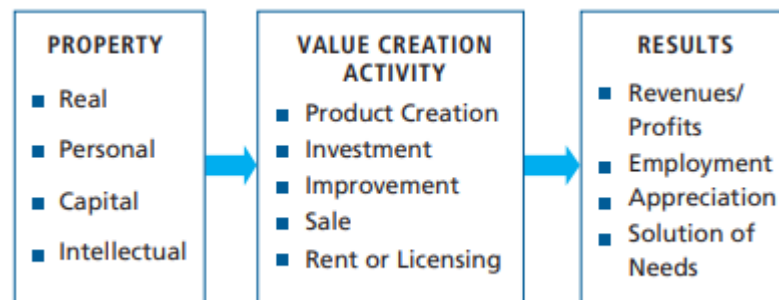


Figure 2.1: Intellectual Property

IP is an asset that has a unique characteristic: it can be purchased while also capable of generating additional profits. As a result, those who own IP see it as a valuable advantage they possess over others. Unlike tangible assets whose values are easily measurable - the value attached to IPs cannot be quantified except when we consider intangible elements such as human experience, knowledge, or even intelligence.

Generally speaking though; every acquisition made seeks to create returns on investment but what makes IPs different is their ability to create varying forms or returns given their intangible nature; derived primarily from creativity and innovation which reside in the intellects of humans.

It's important however to note that there are various types of Intellectual Property Rights each with specific policies in place which regulate their use. Broadly speaking these categories can be subdivided into two main groups: Copyright and Industrial property rights which entail protection for original expressions within creative fields like literature art or music.

Innovation within the manufacturing and business sectors can be safeguarded through Industrial Property. Under this umbrella falls patents for inventions and licensable concepts, along with registered trademarks and trade secrets.

The acquisition of intellectual property (IP) comes with a distinctive advantage wherein it continues to deliver profits even after its purchase. Distinguished for its intangible nature that circles around human experience and intellect instead of physical assets or substances makes it stand out from other forms of investments. It involves diverse types of intellectual property rights governed by corresponding regulations with the primary function being to drive advancement in manufacturing-related industries as well as support trademark protection and licensing.

2.2 TYPES OF INTELLECTUAL PROPERTY

Following are the seven types of Intellectual Property-

1. Patent: Protects an invention that is useful, novel, and non-obvious.
2. Design: Protects the external appearance of an article.
3. Copyright: Protects the expression of an idea rather than the idea itself.
4. Trademark: Word, mark, or slogan which distinguishes one manufacturer's goods from another's.
5. Trade Secret: Protects any commercially valuable information that's kept secret.
6. Mask work: Protects a mask fixed in a semiconductor product.
7. Open Source: Software that has its underlying source code freely available to evaluate copy and modify.

CHAPTER 3

PATENTS

3.1 WHAT IS A PATENT?

A patent is like a property right that only applies within specific geographic areas. It grants an inventor many rights including preventing others from making or selling similar products without permission from them.

In the United States if someone wants a patent they need to apply through the US Patent and Trademark Office (USPTO). The USPTO's role is crucial: it examines every application with great care before granting any patents so as not to disrupt existing innovations or harm future ones. By obtaining a patent from the USPTO inventors gain legal control over how their inventions are used for up to 20 years after the filing date - allowing them full ability to benefit from innovative ideas they have invested much time into developing.

Securing a patent not only shields inventors from legal disputes but also generates an asset with numerous benefits for business deals. The USPTO's issuance of patents spans various industries and technological advancements.

3.2 TYPES OF PATENTS ISSUED BY THE USPTO

- 1. Utility patents** can be given to any person that discovers the suitable approach, system, product of manufacturing, or configuration of the material. Instances: optical cables, electronic equipment, or narcotics.
- 2. Design Patents** can indeed be given to someone who discovers a modern, unique, and sculptural concept about an item of production. Instances: a feel of even a running boot, a cycling jacket, and the characters for the movie Avengers.
- 3. Plant patents** can be given to one who discovers or develops and reproduces some unique and novel plant type.

Generally, a function patent involves the method the product will be utilized and its functions, and a layout patent covers the way the document appears. All other layout and usefulness patents might also be granted in respect of an article if they are innovative, within both their usefulness and in their decorative looks.

A preliminary application is a basic patent filing comprising just a summary of an innovation. A non-provisional filing is indeed a patent submission in its entirety, containing vows, sketches, and statements. We might have to submit a non-provisional application afterward 1 year following the submission of the filing date.

3.3 PURPOSE OF GRANTING PATENTS

One key element within the patent system demands that owners furnish an extensive outline depicting an innovation's practical usage for public record purposes- this being one key obligation owed by those seeking such protection under law. Consequently, insight into novel standards becomes shared across various societal levels driving progress among technological advancements as opportunities emerge from having newer avenues open up constantly. An essential element characterizing intellectual property rights is rewarding pioneering people [who share their concepts] by giving them exclusive rights but making it mandatory for them to share intricate technical details. Transparency is thus a considerable benefit while others enjoy more freedom for research and development on the foundations provided by patent history. By providing in-depth clarity on the particulars of an invention, such records contribute richly to collective knowledge, driving innovation and development among various players in different sectors.

Moreover, post-patent disclosure of inventions guarantees that the public can easily access and develop upon formerly safeguarded ideas.

3.4 WHY CHOOSE PATENTS?

There are four primary incentives embodied in the patent system: to invent in the first place; to disclose the invention once made; to invest the sums necessary to experiment, produce and market the invention; and to design around and improve upon earlier patents.

1. The role played by patents in promoting efficient research and development (R&D) activities cannot be ignored. Today's business environment has witnessed numerous large corporations pouring significant resources - sometimes amounting to billions of dollars - into various R&D initiatives. The existence of patented protections incentivizes these organizations to undertake such projects by ensuring high returns on investment while also protecting discoveries from being pilfered by competitors or third parties without permission or compensation. Without patent safeguards in place, the allocation of resources towards R&D would likely experience a sharp decline making it harder to achieve significant technological advancements and breakthroughs. Just as traditional property rights are meant to be respected corporations would

proceed with caution when it comes to their R&D investments if they lacked patent protections since any discoveries or innovations could be exploited without consequence.

2. The original intent behind patents was simple yet powerful: encourage innovators' willingness towards openness; dissemination of valuable knowledge; technological advancements, allowing everyone access to benefits from those inventions not just a select few. Keep in mind though patents can act as both shield and sword – shielding against theft or unauthorized use while also aggressively enforced when deemed criticized infringement situations occur. Future generations are afforded protections against loss of knowledge as well as the ability to build off the legacy of patents leading to the further development of advancements already encouraged.
3. Certain industries suffer from high fixed costs coupled with either low reverse engineering or low marginal expenses. Examples include the software, pharmaceuticals, and computer processor sectors. Commercializing inventions requires significant outlay for activities such as testing, market development, and factory setup that considerably exceeds initial conception expenses. Should rivals enter the market by offering imitations at marginal production costs without preventive interventions in place to ward them off, companies would have lowered incentives to invest significantly in productization.
4. Innovation is spurred on by patent rights as it provides companies with an incentive to uncover novel approaches that work around existing patents. Through this process better or different technological advancements are made which may have remained undiscovered without such pressure for competition.

Modern-day patents have revolutionized how small inventors operate by giving them greater power as licensors. By licensing their inventions instead of manufacturing them themselves, they can gather capital quickly without worrying about production issues. This approach drives rapid innovation as they concentrate on their inventive work while experts handle marketing and manufacturability tasks.

When a patent is granted by USPTO (the US Patent and Trademark Office) it gives inventors exclusive rights that keep others from creating or selling their inventions within United States borders or importation into America. The grant does not give them permission for personal manufacture or importing; rather it empowers them for preventing unauthorized activities from competitors.

After gaining patent approval inventors are on their own in defending against infringement; they do not rely upon assistance from USPTO.

3.5 LEGAL REQUIREMENTS FOR PATENTABILITY

To patent an invention, the invention must fulfill several pre-defined requirements. The requirements can be listed as novelty, utility, and non-obviousness. Some other legal requirements are also required, such as the need for enablement of disclosure, etc.

3.5.1 NOVELTY

The question of what constitutes novelty is central to the granting of patents: innovations must meet strict criteria of originality to qualify. Among other factors, an innovation-seeking protection must not have been published or made available for public use before its patent application. Some countries require novelty only at the time of submission while others demand ongoing proof throughout the review process.

It is worth bearing in mind that any similar invention made public before your patent application could potentially disqualify your work from consideration under these guidelines. Conversely, even seemingly small changes or improvements can achieve validity if they satisfy these standards.

There is no universal definition of "novelty" and interpretations may differ depending on location. However many countries place significant emphasis on global innovation and consider any invention publicly disclosed anywhere in the world as prior art against a given patent application. This underscores why many inventors are careful not to share their work prematurely and risk jeopardizing their novel status before submitting their applications. Certain nations offer the inventor a period of one year known as the grace period during which they are exempt from public disclosure or commercialization of their invention. This provision exists in the United States. During this brief window, an inventor's disclosure will not be taken into consideration when assessing prior art concerning the patent filing.

3.5.2 UTILITY OR INDUSTRIAL APPLICABILITY

Receiving a patent involves demonstrating practical utility which is commonly referred to as infrastructure or commercial use depending on the region. Both terms address functionality requirements imposed upon innovations during the evaluation process; however ethical considerations may sometimes mean the refusal of patent rights rather than approval.

It should be noted that surpassing existing products or methods does not necessarily determine whether innovation meets the criteria for usefulness required to receive patents - applications simply need only possess functionalities described by their respective inventors.

A specific patent claim format must be followed to fulfill industrial applicability requirements. An example of this could include a patent examiner realizing that rephrasing certain patent claims may result in a tool useful for industrial purposes.

Ultimately while commercial value is considered an important aspect in some cases patents can still be granted based on applicability or usefulness without it. For instance, imagine a new diamond material capable of repelling water from ice being discovered which could have practical applications to prevent pipes from freezing within plumbing systems.

The incorporation of diamond pipes into this technological application would incur exorbitant expenses, impeding its widespread adoption and rendering it untenable to meet utility requirements.

3.5.3 INVENTIVE MOVE / NOT COMMON STEP

A crucial aspect of obtaining patent rights is meeting the requirement of non-obviousness. It's worth noting that many countries view this condition as a measure of creative insight into innovation. The inventive step cannot be perceived as obvious to those with ordinary skill sets in a particular field; otherwise, it fails this test. Essentially, prior knowledge combined should not result in arriving at something similar to what has been discovered through innovation efforts. The timeline for determining this standard fluctuates between jurisdictions but typically relies on either filing dates or when claimants created their inventions. It's essential to appreciate how non-obviousness functions since it helps ensure that patented technologies represent significant departures from existing approaches and knowledge bases within specific fields rather than minor modifications thereof.

3.6 PATENT PROSECUTION

When you submit your patent application to the United States Patent and Trademark Office (USPTO), it undergoes a rigorous review process. USPTO assigns your application to one of its technology centers based on what field your invention belongs to. Once assigned to a center, an examiner reviews it in sequence with other filings or structured procedures- there are no preferential treatments unless outlined by rules or identified by their Director when expedience is necessary.

During the evaluation time frame, examiners assess compliance with legal requirements while conducting thorough searches of all available patents worldwide: U.S., and foreign documentation alike -literary included. This search investigates whether your design fulfills conditions for novelty and usefulness while practicing non-obviousness among other factors outlined in federal law. Finally:

If approved- congrats! Your patented status awaits. It is commonly observed that about 66% of patent applications are approved, and obtain a valid patent.

3.6.1 RESTRICTIONS

In instances where a single patent application features multiple claimed inventions that are independent and distinct, applicants might face requests from the Office to focus on only one of these inventions. If there are more viable ones remaining, these can be pursued through a new submission. By submitting this second claim while waiting for approval of its initial submission, they can take advantage of its original filing date. Before anything else progresses, an examiner may demand that they streamline their claims into just one invention.

3.6.2 OFFICE ACTION

After submitting a patent application, applicants await word from the examiner about their approval status. That communication comes in the form of an "Office action," which is typically directed toward the attorney or agent representing them. Within this document are reasons behind any negative decisions made by the examiner including objections and requirements raised during review periods.

However, in addition to providing this feedback on behalf of their team member(s), examiners share useful references and insights so applicants can weigh up whether it's worth continuing with their application or not. Should examiners find that claimed inventions fall outside what constitutes patentable subject matter, these claims shall be rejected immediately; likewise if prior art knowledge makes inventions seem too derivative with no novelty attached (also known as 'obvious'). It is common practice for some or all claims made within an initial Office action to meet with rejection - only a few get approved with no changes needed.

3.6.3 APPLICANT'S REPLY

When requesting reconsideration of their application from a rejected status, applicants must provide a written request that specifically details any alleged errors present in their original submission acknowledged by examiners at the patent office. Fully addressing each objection and rejection laid out in initial patent office feedback further emphasizes applicants' commitment towards progress towards final determination concerning their idea's patentability.

Simply expressing disagreement with the examiner's assumption will not suffice as convincing grounds for reconsideration; applicants should illustrate genuine effort invested towards correcting deficiencies previously documented before any review of new material submitted.

For instance: When making amendments intended to address concerns identified earlier by patent office staff members via rejections issued by The Examiner assigned as part of your case evaluation team; clearly, articulated reasoning behind changes made should also be provided along with explanations detailing how new revisions overcome any prior barriers to acceptance.

Following the submission of this edited version, expect a new review and notification from the patent office concerning the disposition of your application like the initial evaluation steps already witnessed by your organization.

It's important to note that while interviews with examiners can request, grant, and facilitate rescheduled appointments with patent office-based team members; it will not extend official timeframes for responses required during this stage of the evaluation process.

3.6.4 FINAL REJECTION

The examiner's decision usually becomes fixed during a second or subsequent review after which an applicant's options become limited. Typically, only appealing rejected claims and making a restricted number of amendments remain open as possible courses of action. If there are unrelated objections, applicants may file a petition with the Director as recourse. Responding specifically to a final rejection requires careful attention on behalf of applicants who must address rejected claims either through appealing or cancelling them while also attending to remaining objections or requirements pertaining specifically to their form. A comprehensive final rejection listing all applicable grounds for rejecting claims within an application is issued by examiners.

In the case of the USPTO, the rejections are broadly categorized under these two categories:

1. USC 102 Rejection: Only a single reference is used in making such a rejection under the 35 USC 102. Reference cited under USC 102 rejection discloses the inventive step of the patent and hence, in light of such reference, the invention is not patentable.
2. USC 103 Rejection: A combination of references is used in making such rejection under the 35 USC 103. References cited under USC 103 rejection make the inventive step of the patent obvious to one with ordinary skill in art under the combination of cited references.

3.6.5 NATURE OF PATENT AND PATENT RIGHTS

The patent is issued in the name of the United States under the seal of the United States Patent and Trademark Office and is either signed by the Director of the USPTO or is electronically written thereon and attested by an Office official. The patent contains a grant to the patentee, and a printed copy of the specification and drawing is annexed to the patent and forms a part of it. The grant confers “the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States” and its territories and possessions for which the term of the patent shall be generally 20 years from the date on which the application for the patent was filed in the United States or, if the application contains a specific reference to an earlier filed application under 35 U.S.C. 120, 121 or 365(c), from the date of the earliest such application was filed, and subject to the payment of maintenance fees as provided by law.

The exact nature of the right conferred must be carefully distinguished, and the key is in the words “right to exclude” in the phrase just quoted. The patent does not grant the right to make, use, offer for sale or sell or import the invention but only grants the exclusive nature of the right. Any person is ordinarily free to make, use, offer for sale, or sell or import anything he/she pleases, and a grant from the government is not necessary. The patent only grants the right to exclude others from making, using, offering for sale, or selling or importing the invention. Since the patent does not grant the right to make, use, offer for sale, sell, or import the invention, the patentee’s right to do so is dependent upon the rights of others and whatever general laws might be applicable. A patentee, merely because he/she has received a patent for an invention, is not thereby authorized to make, use, offer for sale, sell, or import the invention if doing so would violate any law. An inventor of a new automobile who has obtained a patent thereon would not be entitled to use the patented automobile in violation of the laws of a state requiring a license, nor may a patentee sell an article, the sale of which may be forbidden by law, merely because a patent has been obtained.

Neither may a patentee make, use, offer for sale, sell, or import his/her invention if doing so would infringe the prior rights of others. A patentee may not violate the federal antitrust laws, such as by resale price agreements or entering into a combination in restraints of trade, or the pure food and drug laws, by having a patent. Ordinarily, there is nothing that prohibits a patentee from making, using, offering for sale, selling, or importing his/her invention, unless he/she thereby infringes another’s patent which is still in force. For example, a patent for an improvement of an original device already patented would be subject to the patent on the device.

The term of the patent shall be generally 20 years from the date on which the application for the patent was filed in the United States or, if the application contains a specific reference to an earlier filed application under 35 U.S.C. 120, 121 or 365(c), from the date of the earliest such application was filed, and subject to the payment of maintenance fees as provided by law. A maintenance fee is due 3.5, 7.5, and 11.5 years after the original grant for all patents issued from the applications filed on and after December 12, 1980. The maintenance fee must be paid at the stipulated times to maintain the patent in force. After the patent has expired anyone may make, use, offer for sale, or sell or import the invention without permission of the patentee, provided that matter covered by other unexpired patents is not used. The terms may be extended for certain pharmaceuticals and for certain circumstances as provided by law.

3.7 ELEMENTS OF A PATENT APPLICATION

To meet patent standards, a written summary of the invention must be submitted within the specification. The summary should cover aspects concerning its creation and utilization with utmost detail. It should also embrace clarity while maintaining precision so that it can be easily understood by individuals with expertise in relevant technological fields or related areas. The specification should have the following sections, in order:

- 1. Title of the Invention:** In creating an innovative product or process, choosing an appropriate title is paramount - one that precisely captures its essence in no more than 500 characters. And for maximum visibility and impact, that same header should feature prominently on the front page of your specification paper (unless previously noted elsewhere within your submission).
- 2. Background of the Invention:** To facilitate clear communication and logical flow, it is prudent practice to provide a brief overview summarizing salient details about an inventive concept before addressing in-depth specifics. In this preliminary description, core features intrinsic to said concept must be highlighted for readers to contextualize accompanying information properly. Notably, this statement may contain verbiage specifying objectives that pertain directly to said inventive concept alone. These objectives need not only intersect but cohere tightly within said inventive concept as well.
- 3. Brief description of the several views of the drawing (if any):** When there are drawings, there shall be a brief description of the several views of the drawings.
- 4. Detailed Description of the Invention:** The detailed description of the invention shall refer to the different views by specifying the numbers of the figures, and to the different parts by use of reference numerals.

- 5. Claims:** Patent claims are usually in the form of a series of numbered expressions, or more precisely noun phrases, following the description of the invention in a patent or patent application, and define, in technical terms, the extent of the protection conferred by a patent or by a patent application.

For instance, a claim can read:

"Method for computing future life expectancies, the method comprising gathering personal data including X, Y, Z, ..."

For patent owners to successfully enforce their rights against suspected infringers they need strong evidence showing how those parties' activity aligns with specific elements outlined in their patents. This means focusing on crafting well-defined claims that capture essential differences between their inventions and earlier works. On the other hand - where claims are less precise or contain fewer limitations - there's an increased likelihood of overlap with prior art leading potentially leading towards rejection during the examination or even invalidation later on.

There are two basic types of claims:

- a. Independent claims:** which stand on their own, and
- b. Dependent claims:** these depend on a single claim or several claims and generally express particular embodiments as fall-back positions. The expressions "in one embodiment", "in a preferred embodiment", "in a particular embodiment", "in an advantageous embodiment" or the like often appear in the description of patent applications and are used to introduce a particular implementation or method of carrying out the invention. Generally speaking, these embodiments conform to a dependent claim or possess the potential to generate one. The law mandates that all such claims should contain narrower terms compared to their principal counterpart. On first inspection, such claims may lack importance; however, incorporating and securing an exhaustive collection of them provides at least three significant benefits for the patent application's creator.
 - i. Clarification of the independent claim language:** Drafting independent claims using vague terminology is one way to ensure competitors don't find loopholes to exploit its scope through subtle modifications. However such vagueness can also lead to questions around what certain terms mean. For example, does referring to something as a "base" automatically imply it has a

"set of legs"? Providing greater clarity on such matters can be achieved by including a dependent claim that specifies "wherein said base comprises a set of legs" if and when the independent claim is granted. Dependent claims are also used to spotlight the inventors preferred embodiment, which represents their ideal design for efficient functionality. While independent claims provide an overview of the invention being patented dependent claim #1 offers a more precise description of this desired embodiment; subsequent dependent claims build on this specificity even further.

- ii. **The possible invalidity of base claim:** Obtaining a patent doesn't offer fool proof protection since its validity remains uncertain during and after the application process. One reason for this is that any prior publication — no matter its language or origin — occurring over a year before filing could invalidate the claim (although U.S. practices are comparatively lax). Given the staggering number of publications worldwide across all fields and languages, achieving absolute knowledge on such matters proves futile; hence patents always feature an inherent level of uncertainty. Nevertheless, while an independent claim may prove ineffective against infringement accusations; dependent claims can sufficiently safeguard valuable commercial spaces.
- iii. **Claim differentiation:** To ensure proper handling and interpretation it is important to understand and apply the principle of claim differentiation in patent law. This principle states that every single claim covers a distinct aspect within an invention when compared to other existing patent applications keeping a broader scope for certain ones that might otherwise seem too restricted at first glance. By adding dependent clauses which rely upon their "parent" clauses- effectively clarifying any potential ambiguity- we further enforce this principle in practice.

Moreover, it is worth noting how we categorize patent applications based on what they aim to protect- for example, physical constructs such as products and apparatuses have corresponding designations: "product claims" and "apparatus claims," respectively. This classification system allows for a more streamlined and efficient process when granting patents.

- 6. **Abstract of the disclosure:** A brief abstract of the technical disclosure in the specification including the novelty in the art to which the invention pertains, must be set forth on a separate

page preferably following the claims. The abstract should be in the form of a single paragraph of 150 words or less, under the heading “Abstract of the Disclosure.”

3.8 HOW PATENTS LOOK LIKE?

The presentation of the patent is addressed as follows:

- Applicant: contains the names of the claimant seeking to preserve the invention;
- Inventor: contains the name of the inventor who made the invention.
- Description: comprises the classification of the patent claims for a clearer understanding of the patent claims;
- Claims: are all statements that are made to protect by the patent law.
- Citation and references: In this section, the patent citations and references are mentioned.

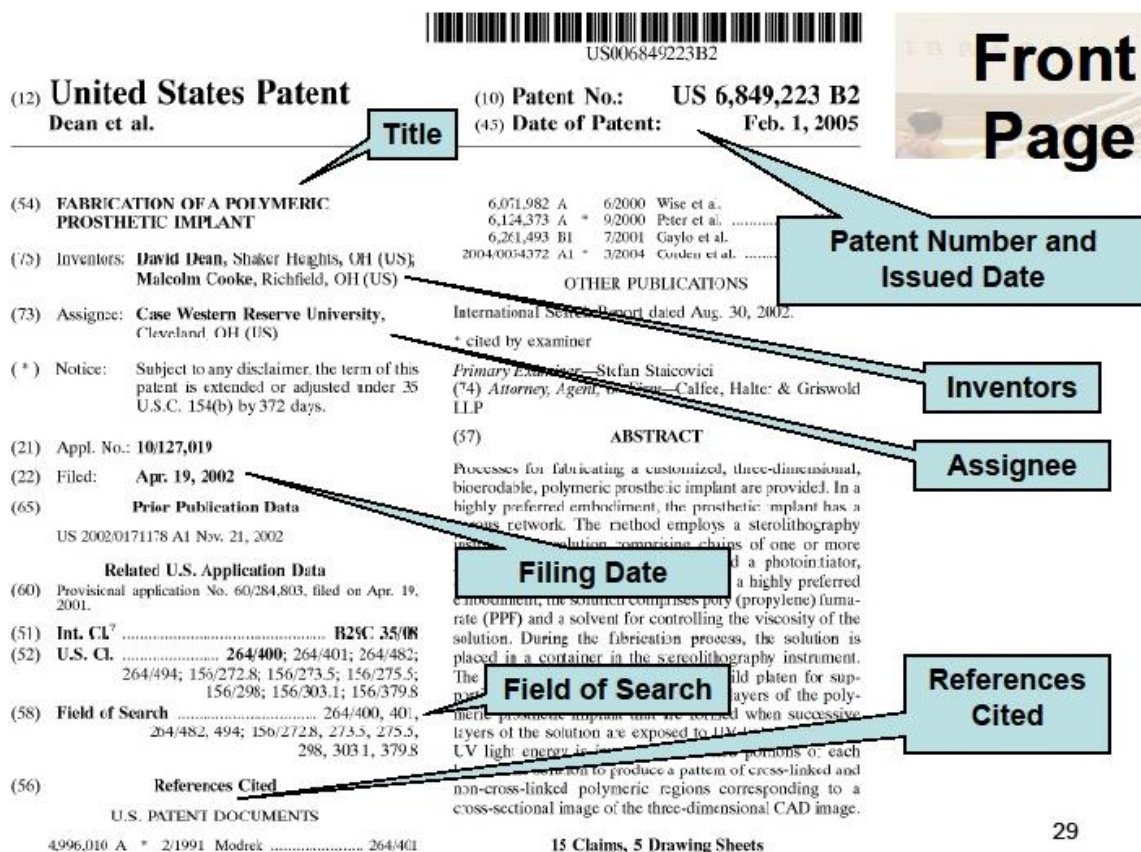


Figure 3.1: Front Page of a US Patent

3.9 IMPORTANT DATE TYPES FOR A PATENT

During the prosecution of the patent, several events occur that are crucial in determining the validity of the patent in various jurisdictions. There is a timeline that every patent follows.

1. **Priority Date:** This is the date when the inventor first files for a non-provisional application at the patent office. In a non-provisional application, an abstract idea about the invention is submitted.
2. **Filing Date:** In case of a new patent application, the priority date and the filing date of the patent are the same. But, in the case of a patent application filed in continuation to the patent family, the filing date of the patent is the date when the patent is filed which is different from its parent application. However, if the claims of the later-filed application are distinctively disclosed in the parent patent, the later-filed application is granted the priority date of the parent patent.
3. **Publication Date:** The earliest publication date of the provisional application with fully structured claims.
4. **Grant Date:** The date on which the patent was granted.

3.10 FILE WRAPPER ANALYSIS

To apply for a patent with PTO officials means you'll need to come prepared with more than just a solid idea. In addition to the practical considerations involved in developing a new method, system, process, or material you'll also need to maintain detailed communication with those officials throughout the entirety of your application process. This communication exchange is carefully documented within a file wrapper - essentially a complete record of all proceedings related to your specific patent application. This folder holds every exchange between the applicant/inventor and PTO officials starting from your initial filing right through until the official patent grant.

In terms of legal requirements governing original and effective work within these categories of industrial production - methods machines the production of materials (including published materials) and composite chemical substances - there are established laws dictating how applicants must proceed. While some terms (such as "machine") are self-explanatory under these laws others may require more clarification. Regardless everything produced by humans essentially falls under one or more of these categories aside from the procedural steps needed to create that work in the first place. As per the patent statute, the subject matter must be "practical." This implies the need for utilization and practicality. A good example is a computer whose purpose is not met; such a device can't meet the threshold of usability and hence is not qualified for patenting.

Our judicial system has defined what constitutes copyrightable material through legal definitions which ensure clear boundaries are set. Any scientific concepts that can be proven through experimentation or theoretical models do not qualify for protection under current laws.

It is worth highlighting that patents cannot simply cover ideas or suggestions; they need to relate specifically to novel hardware, software products, etc., with detailed descriptions provided alongside patent applications.

3.10.1 HOW TO PERFORM FILE WRAPPER ANALYSIS?

The concept of a "file wrapper," according to PTO terminology, refers to a specific directory that holds records of a given application or program. Its purpose is to maintain comprehensive documentation throughout all processes associated with acquiring a patent through PTO - starting from initial applications and culminating in successful patents. A host of information can be found within these directories including but not limited to; correspondence exchanged between applicants (or their attorneys) and officials at PTO, actions taken during an examination request process along with relevant documents submitted alongside applications; details regarding consultations with patent examiners, etc.

In brief, the file wrapper denotes the collection of documents and communication linked to a particular patent request. It holds significant value as a source of info for patent prosecution and litigation purposes. The court relies on the contents of the file wrapper to determine the nature of the claimed invention and the rights of the patent owner. The concept of file wrapper estoppel highlights how the details within the file wrapper can limit the scope of the patent.

3.10.2 IMPORTANT SECTIONS IN THE FILE WRAPPER ANALYSIS

Various patent offices have different file arrangements and sections in their file wrapper. It is important to look for those sections to understand what has happened in the patent's prosecution history and it also helps us to understand better, why the patent got granted. Some important sections to look for in the file wrapper are as follows.

- Amendments
- Communication between examiner and applicant
- All claims files to get an idea of initial and final claims.
- Notice of allowance
- ISR document
- Final and non-final rejections (both are the same)

- References cited by the examiner.
- There are categories of documents cited by the examiner in European patents. They are namely X, Y, and A
 - X is equivalent to USC 102 (novelty check)
 - Y is equivalent to USC 103 (the application is obvious)
 - A is equivalent to USC 103 (Prior art)
- Sometimes priority dates can be changed by the applicant by passing an affidavit in which the reason for this cause is present.

CHAPTER 4

SEARCHES CONDUCTED AT GREYB

4.1 TYPES OF SEARCHES

According to the client requirements, GreyB conducts a wide variety of searches which are further discussed in the coming subsections.

4.1.1 PRIOR ART SEARCH

The main objective of the prior art search is to find references that are legally valid and were available in the public domain, before the priority date, that discloses the inventive step of the patent in question.

The prior art search can be further classified into the following types.

1. Patentability Search / Novelty Search

To ensure your invention's novelty and non-obviousness when applying for a patent you must perform a comprehensive patentability search. This search will help you gain valuable insights into which type of claims are likely to be approved by the PTO while avoiding examiners' restrictions and reducing response time/costs.

Moreover limiting examination processes might prevent patentees from claiming all equivalents in their patents' elements' scope but bear in mind that relying entirely on the PTO's searches and examinations may leave some broadest or most valuable claims invalid or too costly to defend due to inherent gaps regarding depth/coverage. In summary, performing a thorough patentability search crucially aids in understanding claim acceptability and avoiding unnecessary restrictions during the examination.

However, relying solely on PTO searches may not provide comprehensive protection against future challenges related to claim validity.

2. Clearance Search

To produce or utilize a particular product or process lawfully, businesses need to conduct a thorough clearance search first. Its primary objective is to detect any patents with claims that have the potential of prohibiting them from practicing, selling, or producing their desired product/process legally. It's important to recognize that conducting such searches differs from

performing patentability searches in terms of criteria used during examination processes - novelty and non-obviousness emphasized for patentability but infringement requirements focused on during clearance searches instead.

Patents give the owner, permission to exclude others from using what they've claimed; however, they do not give them unrestricted freedom concerning complete claim practices. To avoid infringing upon other people's intellectual property rights (IPRs), companies must perform professional clearance searches addressing both the scope of intention and phrasing in patents thoroughly. Individuals possessing a university degree will find the following piece of writing comprehensible. The style employed for this text is that of a report. The following passage shall be rephrased four times whilst maintaining the original tone, arguments, references, and quotes; only sentence structure shall differ.

3. Validity/Invalidity Search

To challenge or defend an issued patent's validity – usually in litigation – parties often undertake what's known as a "validity/invalidity search". These searches focus on assessing whether a given patent is indeed valid by examining potential grounds for invalidation such as novelty or obviousness. One key purpose behind these searches is to identify overlooked prior art which could weaken a patent's claims.

By finding proof that predates its priority date and encompasses all its claimed elements (or relevant ones) parties aim to show that an issued patent is not as strong as initially assumed. A broad-ranging approach characterizes such searches which may also consider possible new combinations of previously existing elements.

By analyzing all available evidence in detail parties involved strive for clarity about potential flaws within this legal matter – highlighting possible areas where improvement might be needed for litigation – if it becomes necessary – to stand a fair chance.

In summary validity/invalidity searches are an essential part of assessing the strength and validity of issued patents by identifying pre-existing art which may question their claims. The searches carried out are comprehensive and meticulous, intending to reveal any prior art that could potentially dispute the patent's originality or lack of apparentness.

4.1.2 LANDSCAPE SEARCH

These searches are tailored to the needs of the client and provide the information necessary to make strategic IP and business decisions. IP managers, consultants, and advisors provide a different service than agents and attorneys. However, they, like agents and attorneys, often do not have the expertise to mine the data needed to provide businesses with sound advice and strategies.

4.1.3 INFRINGEMENT SEARCH

It is, therefore, a skillful study to determine whether an object or a process infringes a patent. Infringement work allows patents to determine whether an object or practice infringes intellectual property rights.

On this aspect, copyright analysis helps businesses associated with a product/way to evaluate that a service or device infringes intellectual property rights. The discovery of violation is a crucial step in the creation or modification of products.

CHAPTER 5

PRIOR ART ANALYSIS

5.1 WHAT CAN BE A PRIOR ART?

Any publication, in any form, in principle qualifies as prior art. Often earlier patents and scientific publications are used because those are the easiest to find. But also, textbooks, newspapers, lectures, demonstrations and exhibitions, and any other disclosure can be used.

Of course, the proof of what was demonstrated or exhibited can be complicated.

5.1.1 ANY PUBLICATION

When examining prior art within patent law, it's important to acknowledge that any document from any source can be considered as such. This goes beyond earlier patents or published patent applications. Irrelevant components include language used within said document, how numerous copies were distributed, and if others read or purchased them- instead what's most vital is accessibility by individuals before the critical date. Even one copy of something like a Ph.D. thesis discovered inside a university library or an article from smaller publications such as Irkutsk Daily Gazette can still be taken into account as prior art pieces.

Regardless of whom its audience was intended towards publishing-wise does not matter when discerning which pieces should be classified under this category; both highly technical journals geared towards electrical engineers and student-targeted textbooks qualify equally if they were made available publicly before filing dates relating to patent submissions. Essentially, if documents circulated on time and were accessible by those interested, then they can be classified under prior art for patent purposes.

The document's origin, language, and target audience are typically irrelevant in ascertaining its classification as prior art.

5.1.2 ANY MATERIAL AVAILABLE TO THE PUBLIC

When determining whether something counts as prior art we need to look past its level of dissemination and focus on public accessibility instead. It doesn't matter if everyone had read a particular piece of work or how difficult it was to locate; what's essential is whether a typical member of the public could obtain access to it without breaking any confidentiality agreements or committing illegal acts.

Even works with limited circulation like those published in esoteric journals or uncatalogued books within libraries can qualify as prior art provided they were available for view by the general populace. Likewise, handouts distributed during paid-for conferences can be viewed as examples of prior art provided everyone who attends has access to them.

In summary: It's not about how widely accessible nor how simple something is to find; accessibility by the average individual without any legal qualms is what makes something constitute prior art.

5.1.3 MAKING AVAILABLE AND EXHIBITIONS OF PRODUCTS

Before filing a patent application, it's important to consider the possibility of a device already being introduced into the market. Publicly available devices could compromise the novelty of any specific feature found within them. This is due to all features becoming "prior art" once the said device is sold or disposed of after public release.

In circumstances where a product is publicly demonstrated but not sold – only visible features are considered to be prior knowledge.

Within the United States 35 US Code 102(b), both selling and demonstrating inventions count towards prior knowledge – even when concealed within larger machines or articles. However, this consideration only applies if said inventions are used according to their natural purposes while being naturally accessible by the public.

If an inventor has command over how their invention is utilized by others - then it doesn't qualify as public use and hence cannot become part of prior knowledge.

To conclude, any publicly available product (sold or demonstrated) could potentially become prior knowledge. Despite difficulties in determining some aspects of product composition/functionality- mere existence and usage could nullify claims of novelty.

5.1.4 ENABLING DISCLOSURE

To meet prior art requirements, any document should provide an average skilled person with sufficient data necessary for practicing the claimed invention successfully. Although science-fiction novels may mention inventions casually, they're deemed incomplete without detailed instructions on constructing such inventions practically feasible. Considered widely successful in pop culture history is the Star Trek TV series "transporter" device that conveys starship personnel and cargo between

two points within seconds; however no specific information is available about its inner workings and construction procedure involved in making this possible.

5.1.5 SOME UNCONVENTIONAL PRIOR ART

Patent law offers an engaging example of salvaging sunken vessels using buoyant bodies fed through appropriate tubes. Apparently, one such method attempted via a patent application got denied due to being akin to earlier publications regarding the same procedure. The specific document in question was "The Sunken Yacht," composed by Carl Barks featuring Donald Duck raising sunken ships using ping pong balls delivered through conduits.

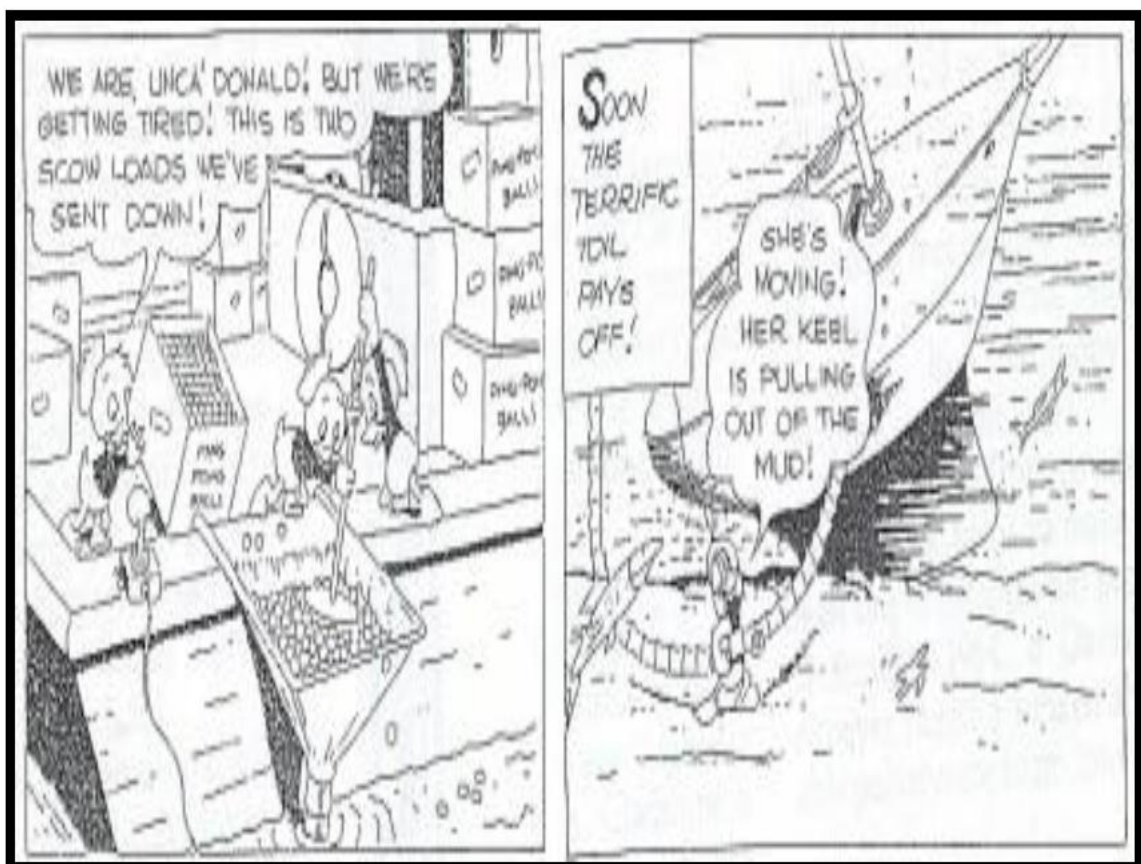


Figure 5.1: A scene from the Donald Duck Comic

Since these balls retain floatation properties frequently helpful with watercraft and were utilized alongside pipes in the story; some contend that said technique wasn't novel or new upon submission into said patent office. Thus calling for subsequent rejections and classification as novelty-destroying prior art that could nullify any patent filings based on the same disclosures.

Unfortunately, whether or not this story played a role in the ultimate decision remains unclear.

All relevant case files have long since vanished through destruction and the patent attorney associated with this potential case has since passed away. Controversy surrounds Krøyer and his connection to Donald Duck with conflicting accounts suggesting varying levels of involvement or influence. Some sources suggest that Krøyer himself recalled childhood ties to the character but this theory falls short under scrutiny. Given his age at the time of publication (35) it appears improbable that any youthful impressions could have played a role in shaping his work.

5.2 HOW IS PRIOR ART USED?

One of the most crucial facets involved in patent examination revolves around determining whether or not inventions demonstrate qualities novel and non-obvious in nature. This calls for extensive searches focused on prior art - earlier publications that unveil or hint at aspects of applicants' inventions.

Patent systems exist primarily with intentions being geared toward promoting inventor disclosure before broader audiences; hence any innovation submitted must meet newness standards if it is ever granted the status of being patented.

When during examinations it appears that submitted inventions fall short of meeting necessary levels concerning their features relative to novel and non-obvious attributes even if previous grants have been awarded, then applications inevitably face rejection. In addition to possible rejections, granted patents themselves also remain susceptible to challenges mounted in the future.

The foundation of this entire process involves extensive research efforts analyzing pre-existing literature predating filing dates - referred to as "state-of-the-art." Any documents uncovered during these searches are identified as "prior art." They serve a critical function for examiners by providing fundamental elements upon which subsequent assessments of the novel and non-obvious attributes can be made.

Throughout this examination period, specific attention will be paid to examining inventors' particular claims. When analyzing a prior art document, one proceeds by gauging it against its associated claims. To provide further clarity, we specify that when referring to an "invention", we mean its definition as per independent claims from either a patent or application.

To qualify as relevant, a previously published piece must adhere to certain guidelines: it should feature descriptions for each aspect enunciated within a patent claim -explicitly or implicitly- while

including all requisite elements arranged identically detailed within the said assertion. Any deviation from these defined parameters can render an innovation unoriginal and therefore void. Legal professionals may colloquially refer to these kinds of publications as "killer" pieces but tend towards calling them "relevant" when dealing with their own assigned cases.

5.3 PATENT SEARCH

Conducting a patent search is a crucial component in uncovering prior art that relates to your invention. Prior art encompasses all relevant existing knowledge or information which can range from previous patents to articles, data books, catalogs public discussions, trade shows, and instances of public use or sales worldwide.

The legal requirements for novelty and non-obviousness are essential for the grant of a patent, which is why searching for prior art is so important.

By exploring databases thoroughly during the patent search process you can determine if your idea has already been patented and assess the patentability of your concept. A thorough patent search will highlight any identical, similar, or partially similar inventions to the one you wish to patent.

As a bonus, viewing and reading already issued patents will:

- help you to write your patent application
- help you understand your competition
- help you avoid patent infringement
- help you learn more about your field of invention

It is also a good idea to write down any patent assignees that you notice listed in the patents you examine. They may be in the market to license patents in your field of invention - more about this later.

5.4 PATENT CLASSIFICATION SYSTEM

Patents are organized by class and subclass of invention, similar to the way books are organized in a library). By using the classification system, you can find and examine patents that are in the same field (class) as your idea. There are primarily two classifications that are used worldwide.

1. IPC Classification System
2. CPC Classification System

Apart from these mentioned classification systems, Japan has its separate classification system known as the F- term Classification. The above classification classes come in handy while performing the search in various patent databases. It helps us to capture the domain and well as restrict the search query from collecting irrelevant patents.

5.5 CONDUCTING A PATENT SEARCH

To get a basic understanding of patent searches read “Searching For Students” and in particular read “Searching Using Key Words”. It was written for students; however, if you can look past the cute language, it will quickly get you reading and searching patents online within minutes. It will not be enough to do a diligent (complete) search for prior art by only using the Internet. For that, you would need to understand the patent classification system and be prepared to do days or even weeks of research.

5.5.1 STRATEGIES FOR STRING GENERATION

While searching with unique keywords, it is essential to use the synonyms of the keywords to perform a more comprehensive search. There might be cases where the synonyms for a keyword might be completely irrelevant to the target patent.

These collated keywords are then used to generate string logic to search within the various patent databases. The key strategies to keep in mind while generating the string are listed below.

For Example: Consider a patent having features A, B, C & D. Then while generating strings we can but are not bound to follow the following combinations.

- Classes of A + Keywords of B, C & D
- Classes of A, B + Keywords of C
- Keywords of A, B, C & D

In the same way, the combinations can be altered and new logic can be made. It should be kept in mind that the features A, B, C & D are written in order of importance with A being the most important feature of the subject patent. If we want to create narrow strings we will use the class for feature A, i.e. the most important feature, and combine it with keywords of features B, C & D. Another approach to generate strings would be to follow an application-based approach. It means identifying the applications of the subject patent and formulating the strings accordingly. All these strings are restricted by the priority date of the subject patent.

5.6 DATABASES FOR PATENT SEARCH

You can conduct your patent search of databases online. You can also visit a specialized library that stores copies of issued patents. Below are listed some examples of online search databases:

- Orbit
- Derwent Innovation
- Ambercite
- Patbase
- JplatPat
- Google Patents

CHAPTER 6

PROJECT WORK

6.1 NON DISCLOSURE AGREEMENT

According to the GreyB company policy, I am bounded by the non-disclosure agreement through which I can't disclose the sensitive details of the project including client information and any internal document id. I will try to explain the project work done by me during my role as a Junior Research Analyst (JRA) under the direct supervision of my mentor.

6.2 LIST OF PROJECTS

During my role as a JRA, I worked on multiple projects including several technologies. Following are the projects that I've worked on during my internship tenure.

1. Transport format selection
2. USB hub device
3. Network Type Determination

6.3 TRANSPORT FORMAT SELECTION

6.3.1 OBJECTIVE OF THE PROJECT

In this project, the client asked us to perform an invalidity search. Usually, an invalidity search is performed under the following scenario.

For example: Consider that company A, which is a GreyB client asks us to invalidate a patent whose current assignee/ owner is a different company B. Now, in this scenario company B might have found out whether company A has a product that is based upon their invented technology. Pursuing that, company B will either approach Company A to make the latter pay a licensing fee to the former or Company B will file a lawsuit against Company A. If, the patent gets invalidated, then it will prove that the invention claimed in the patent was not novel and therefore, company B has no right to claim monetary benefits.

6.3.2 TECHNOLOGY DESCRIPTION

This project deals with a specific method of uplink transmission in WCDMA technology. In WCDMA release 6, 3GPP introduced enhanced uplink transmission to enable high-speed transmission. To achieve so, a new MAC layer known as MAC-e was introduced.

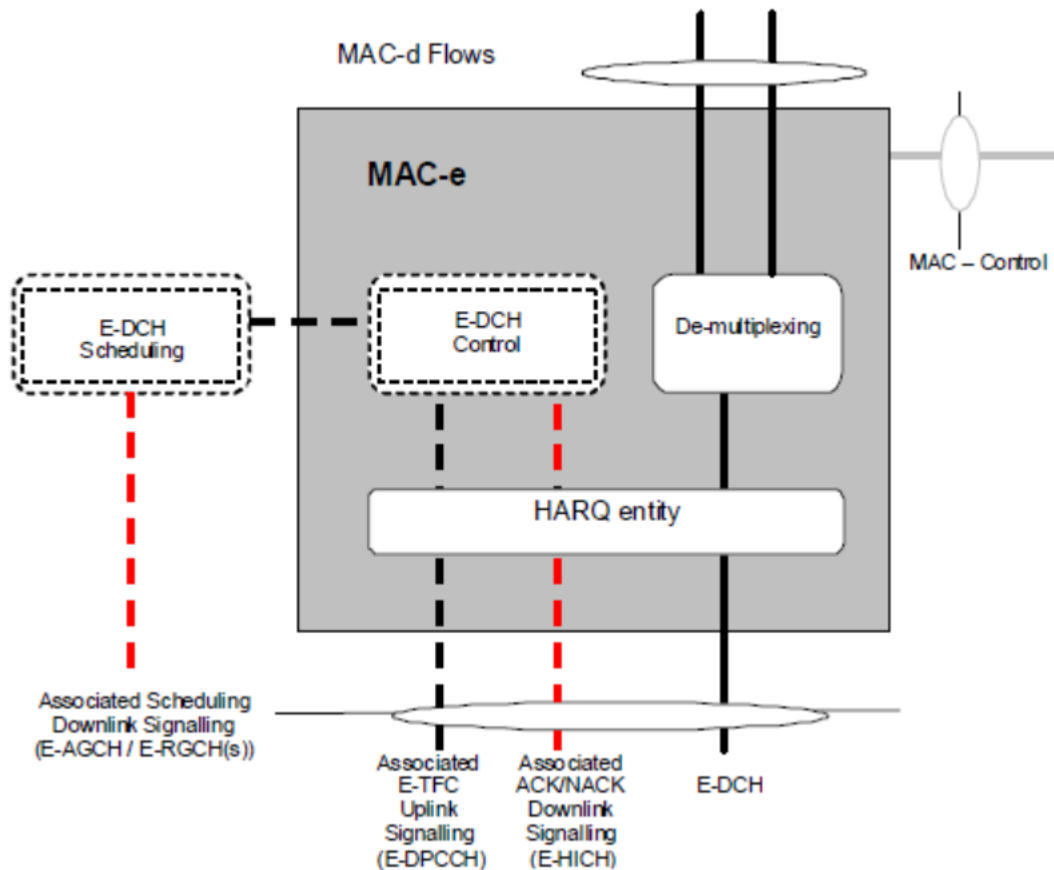


Figure 6.1: MAC-e Structure

The technology described in the project discloses the selection of transport format combinations. The selection is based on the optimized selection of transport format combination from a transport set corresponding to the grants received from the UTRAN and the remaining data to be transmitted to the UTRAN by the UE.

6.3.3 STRATEGIES USED FOR INVALIDATION

A comprehensive search needs to be conducted to invalidate the patent. According to patent laws, in the United States jurisdiction, a patent can be invalidated according to the following laws:

1. 35 U.S.C 102
2. 35 U.S.C 103

The following strategies can be used to successfully invalidate the patent:

- Get a thorough understanding of the project.
- Since, the patent was a SEP, it is tough to invalidate but I backtracked the 3GPP standard documents to check for the company which filed the CR document for the specific technology.
- I found some leads from the backtracking and started the search with those companies in mind to see the possibility of the same technology.

- The search was focused on the novelty aspect of the project. This strategy is applied to make the search narrow and if there exists a valid prior art, it can be found.
- I used various patent databases with different search strings to generate a patent set comprising around 100 ~ 200 patents.
- After the analysis of these patents, we can generate some insights into the evolution of the technology.
- A search is conducted on 3GPP standards to check if there was an existing document that disclosed the invention and was before the priority date of the project.
- Select the necessary references from the search.
- Map the project's claims to the selected references.

6.3.4 CONCLUSION OF THE PROJECT

The client was provided with a solution with multiple USC 103 references. These references can be used by the client to show that the result of the invention disclosed in the patent was obvious in light of those references to a person having ordinary skills in the art.

6.4 USB HUB DEVICE

6.4.1 OBJECTIVE OF THE PROJECT

In this project, the client asked us to perform an invalidity search. In this particular project, the client was sued by a company and it was a litigation-grade search. Although, the client already had some good references they lacked one essential component and there were cases where the plaintiff company had won lawsuits with different companies on the same patent. We were instructed to find the specific feature and had a very critical deadline.

6.4.2 TECHNOLOGY DESCRIPTION

This project deals with the connectivity mechanism inside the USB hubs. USBs are an essential part of connecting various devices like computers, mobile phones, etc. A USB hub is a device that eliminates the requirement of multiple individual ports in a device by increasing the number of devices that can be connected to a single port. The structure of the USB hub disclosed consisted of a single upstream port and multiple downstream ports. Usually, the USB host is connected to the upstream port and other peripheral devices are connected to the downstream port. But, in this project, the inventive step was the disclosure of a method to communicate with a USB device that is connected

to any of the multiple downstream ports and can act as both host and device. Following is a figure of a USB hub as disclosed in the USB 2.0 revision 2 standard document.

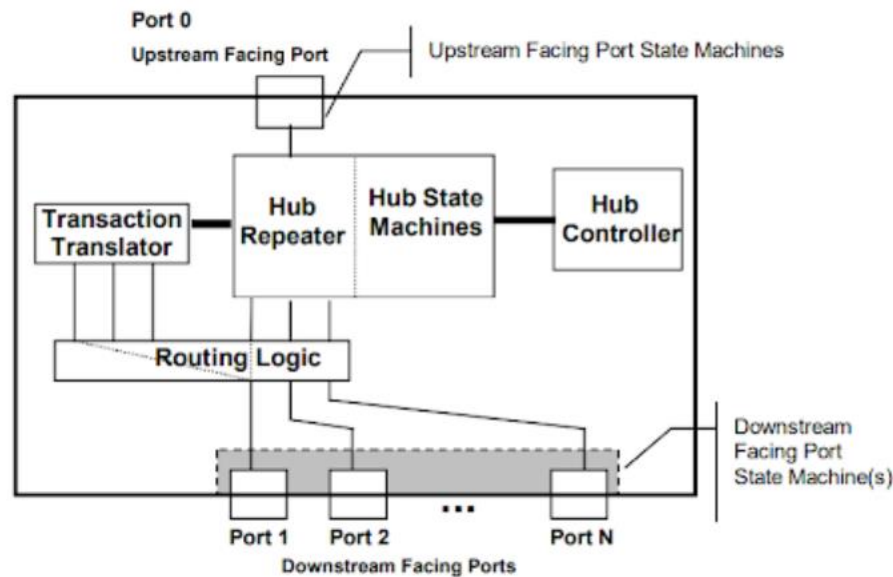


Figure 6.2: Internal structure of USB hub

6.4.3 STRATEGIES USED FOR INVALIDATION

A comprehensive search needs to be conducted to invalidate the patent. According to patent laws, in the United States jurisdiction, a patent can be invalidated according to the following laws:

1. 35 U.S.C 102
2. 35 U.S.C 103

The following strategies can be used to successfully invalidate the patent:

- Get a thorough understanding of the project.
- Going through the complaint document shared by the client.
- The search was focused on the novelty aspect of the project. This strategy is applied to make the search narrow and if there exists a valid prior art, it can be found.
- I used various patent databases with different search strings to generate a patent set comprising around 100 ~ 200 patents.
- After the analysis of these patents, we can generate some insights into the evolution of the technology.
- An NPL search was conducted on the internet to find if there was a disclosure of the invention that can be categorized as a USC 102/ 103 reference before the priority date of the project.
- I found a very good reference that can be used as a USC 103 reference.
- Select the necessary references from the search.
- Map the project's claims to the selected references.

6.4.4 CONCLUSION OF THE PROJECT

The client was provided with a solution with multiple USC 103 references. These references can be used by the client to show that the result of the invention disclosed in the patent was obvious in light of those references to a person having ordinary skills in the art.

6.5 NETWORK TYPE DETERMINATION

6.5.1 OBJECTIVE OF THE PROJECT

In this project, the client asked us to perform a validity search for their patent. The client was trying to apply for a SEP with the 3GPP. SEPs include patents that state here that patent complies with the existing technical standards. Delineated standards bodies involved in producing technological requirements allow applicants to report and issue patent licenses like the 3GPP.

6.5.2 TECHNOLOGY DESCRIPTION

This project deals with a specific method of network type determination of a target network in a wireless communication network. The technology disclosed in this project covers multiple wireless communication technologies like GSM, CDMA, WCDMA, GPRS, LTE, UMTS, WiMAX, and 5G/NR systems or other similar technologies. The project describes a method of determining of network type of a target network by the UE wherein the network type can be a private or a public network. This determination by the UE is performed by reading the system information of a currently connected cell.

6.5.3 STRATEGIES FOR VALIDITY CHECK

A comprehensive search needs to be conducted to check if a patent will hold if it comes under an invalidation threat. According to patent laws, in the United States jurisdiction, a patent can be invalidated according to the following laws:

1. 35 U.S.C 102
2. 35 U.S.C 103

The following strategies can be used to successfully invalidate the patent:

- Get a thorough understanding of the project.
- Going through the claim chart shared by the client.
- The search was focused on the novelty aspect of the project. This strategy is applied to make the search narrow and if there exists a valid prior art, it can be found.

- I used various patent databases with different search strings to generate a patent set comprising around 100 ~ 200 patents.
- After the analysis of these patents, we can generate some insights into the evolution of the technology.
- A search is conducted on 3GPP standards to check if there was an existing document that disclosed the invention and was before the priority date of the project.
- Select the necessary references from the search.
- Share if a conflicting art exists.
- Map the project's claims to the selected references.

6.5.4 CONCLUSION OF THE PROJECT

The client was provided with a set of conflicting art that we found were very close to the subject patent but even the combination of those references to disclose the novelty of the project seemed inferential. These references will help the client to carefully proceed with the SEP application at 3GPP.

CHAPTER 7

CONCLUSION

7.1 CONCLUSION

As a Junior Research Analyst during my internship at GreyB Services, I consider myself lucky to have had an opportunity for invaluable practical experiences that would have been unobtainable only through theoretical classrooms' usual approaches. Given that GreyB is a significant player in intellectual property and patent services, this exposure provided insights into how crucial intellectual property law is today.

Moreover, the technical aspects involved improved both my professional knowledge as well as potential career preparation in various technology-related fields. Through this industrial training program, I could bridge the divide between abstract research-based or classroom concepts and their practical uses in corporate settings. Amongst all experiences gained during this time, working on live projects would undoubtedly rank highly as it allowed me to apply technical and analytical skills that helped improve team productivity while boosting confidence levels about what we can achieve collectively as an organization.

My career journey's significant turning point was undoubtedly my industrial training stint at GreyB Services. An incredible experience that opened doors for vital corporate insights that remain unmatched within any other aspect of professional growth. These invaluable gains have equipped me with skills, knowledge, abilities, and preparedness needed not just for professional life but also for personal development. As a grateful recipient of all these multi-faceted benefits, I now seamlessly transition into full-time employment with utmost self-belief.

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