

# **INTELLECTUAL PROPERTY RIGHTS**

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

## **BACHELOR OF TECHNOLOGY**

**IN**

## **ELECTRONICS AND COMMUNICATION ENGINEERING**

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## DECLARATION

We hereby declare that the work presented in this report entitled Forgery Detection Using Machine Learning (Credit Card Fraud) in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology in Electronics and Communication Engineering** submitted in the department of Electronics and Engineering Communication, Jaypee University of Information Technology Wakanaghat is an authentic record of my own work carried out over a period from August 2015 to December 2015 under the supervision of **Dr. Shweta Pandit** Assistant Professor (SG) Dept. Of ECE.

The matter embodied in the report has not been submitted for the award of any other degree or diploma.

Shubham Jha

191021

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

Dr. Shweta Pandit

Assistant Professor (SG)

Dept. Of ECE

Dated:

Head of the Department/Project Coordinator

## ACKNOWLEDGEMENT

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We are really grateful and wish our profound my indebtedness to Supervisor Dr. Shweta Pandit , Assistant Professor (SG), Department of Electronics & Communication Engineering Jaypee University of Information Technology, Wagnaghat. Deep Knowledge & keen interest of our supervisor in the field of “Machine Learning” to carry out this project. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

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I would also generously welcome each one of those individuals who have helped us straight forwardly or in a roundabout way in making this project a win. In this unique situation, we might want to thank the various staff individuals, both educating and non-instructing, which have developed their convenient help and facilitated our undertaking. Finally, we must acknowledge with due respect the constant support and patients of our parents.

Shubham Jha

(191021)

## LIST OF ACRONYMS AND ABBREVIATIONS

<b>Abbreviation</b>	<b>Meaning</b>
LLP	Limited Liability Partnership
ISO	International Standards Organisation
R&D	Research and Development
USPTO	United States Patent and Trademark Office
TM	Trademark
PPA	Provisional Patent Application
PCT	Patent Cooperation Treaty
IPC	International Patent Classification
CPC	Cooperative Patent Classification

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## **ABSTRACT**

Patent as well as literature search forms the basis of a novelty search project. It is an indispensable part of any type of service provided by a law firm. It can be accomplished using various approaches of searching such as keyword based searches, class based searches, semantic searches, sequence searches, structure searches etc. Here we attempted to break the novelty feature of the subject matter by performing keyword based searches on databases like Google Patents, Espacenet, WIPO &USPTO and analysing the subsequent results. We found relevant patents as well as literature references which sufficiently covered all the key points mentioned in the requirement, thus conveniently making the subject matter in question non-patentable.

# CHAPTER 1

## INTRODUCTION

### **1.1 About the Company:**

Signicent Information Solutions LLP (ISO 9001:2008 certified) a worldwide Knowledge Process Outsourcing (KPO) company, is one among the pioneers in IP Research, Market & Business Research as well as Offshoring of Educational services. Established in 2012 by highly competent experts, Signicent is an able team of young and adept talent that gives us an upper hand over our counterparts. Signicent was given prominence in the March 2015 edition of Silicon India Magazine in “25 Most Promising Global Outsourcing Companies.”

The current principal team has joint experience of engaging with over 25 Fortune 100 companies and more than 200 companies. Signicent has over the years collaborated with startups, small size companies, mid and large size companies in past. We have served all kinds of clients all across the globe: Corporates, Law Firms, Universities, Small business, Investment and licensing firms, Individual Inventors and Researchers.

We appreciate our clients needs thus time and again our lineup comes up and makes endorsements to makes us stand above the crowd in the vast business of consultancy. Our services are tailor-made as per the clients needs and thus help delivering explanations which are convenient and ‘ready-to-use’ for informed decision making.

### **1.2. Services Provided:**

#### **1.2.1. Patent Landscape-**

Patent Landscape is a search usually asked to get a strong hold over a given area of technology. Many firms frequently ask for a landscape search to generate a unique database source of relevant patents dealing with the technology in question. The proclivities that arise from such a search can be insightful for taking important business and R&D decisions, gaining insights about competitors, assisting the R&D team and to dig out the often left out white spaces in the said technology.

The landscape analysis is most handy when coming up with a new product in line or at the time of research and development to realise the gaps in the area of interest.

#### **1.2.2. Prior Art Searches-**

##### **1.2.2.1.State of the Art Search**

The state of the art search is rarely carried out to come with relevant patents related to definitive area of interest. This type of search may either cover patents worldwide or from a said area of geographical interest. These searches differ from a landscape search in the sense that they are broad but not as broad as latter, which often remains a lot on the surface but almost never dives deep. While in case of state of search, we conveniently narrow down on the area to be covered and dig in deep to answer few targeted questions put forth by the clients.

### **1.2.2.2.Invalidity Search**

The reason why mostly relevant prior arts are dropped is that there is quite large prior art out in the world today and owing to unimaginable work load at patent offices worldwide it becomes difficult for patent attorneys to spend sufficient time on each case. On top of that, over and over, language impediments as well as non-availability of relevant literature from various foreign patent offices, leads to losing out on existing foreign prior art. Even though patent examiners are highly experienced and there is little scope for mistakes, even then no search is perfect. Therefore, to confirm the validity of patent, this search becomes obligatory before a final decision is made.

### **1.2.2.3.Freedom to Operate (FTO) or Clearance Search**

The Freedom to Operate or the FTO search, in other words a clearance search is done to determine the key companies and/or organizations and their corresponding patents which may prevent the exploitation of the said patent in question in a particular geography of interest. If there does exist such patents, the client may be easily able to bargain for or in-license the overlapping patented technology before introducing the product in the said area to avoid suing by the patentee later.

### **1.2.2.4.Patentability or Novelty Search**

The sole and foremost motive behind conducting a patentability or so called novelty search is to assure if the method/process or the product/composition in question that is invented is patentable or not. This usually forms the preliminary stage when it is carried out prior to filing an application. The resulting hits of patentability search thus help the patentee in drafting a patent so as to ensure that his/her claims are neither not too broad to overlap any existing prior art nor too narrow that it misses the coverage itself. The results of patentability search can be assuredly given as references in the background section of patent. These patents, once cited and approved by examiner, cannot invalidate the granted patent later on.

### **1.2.3. Scientific Literature (NPL) & Research Article Search**

Signicent is capable to conduct one of the most reliable and timely scientific literature, Non-Patent Literature (NPL) and research article searches. With access to over 3 million full text documents in technology and engineering areas and equally exhaustive access to about 6,800 journals in life sciences and chemistry domains, we have the right kind of resources and expertise to conduct literature search projects for our clients.It is important to understand that literature searches are as important as patent searches for challenging the patentability of an invention.

#### **1.2.4. Design Search**

The design for an article (product, apparatus etc.) consists of the visual characteristics of an article. The design can be related to: configuration of the article, surface or ornamental appearance of an article, or the combination of above two. The basic difference between the “utility patent” and “design patent” can be understood that while the former protects the way an article or object is used or work on the other hand later protects the way the article or object looks in appearance. An article can thus be subjected to both or either of the two protections however design patents are narrower in protection scope as compared to the utility patents.

Significant can conduct design searches using commercial global brand databases, DesignView databases, Design classification codes and several other product databases for novel design.

#### **1.2.5. Patent Infringement Search**

Patent infringement search generally is asked to perform when a competitor in the market begins to use, sell or make the patented product in question without prior consent from the patent owner. Henceforth, using, making or selling a still alive patented invention in a given geographical area where the product is patented, without obtaining the license to do so from the sole patent owner amounts to infringement of patent and thus can be challenged in the court. Thus, infringement searches are essentially performed to locate products already in the market that may be found to be using the same technology without prior permission or knowledge of the patentee.

#### **1.2.6. Patent Watch**

Patent Watch, or broadly called as the IP watch, is asked by clients to perform so as to maintain vigil on a particular patent of interest in case of technology (or simply called as technology watch) or a patent in case of company (also called as competitor watch). Also quite interestingly in most cases often, apart from a competitor watch or a technology watch or both, legal status watch is also of keen interest to clients to understand how various patents are progressing in the patent office.

The said searches may be performed on a weekly, quarterly, monthly or on a bi-yearly basis or at a pace of interest. While a bi-weekly or monthly IP watch report may be more handy in case the said tech is quite in the run, a quarterly or half yearly reports may be meaningful in case the tech is slowly coming up.

#### **1.2.7. Competitive Intelligence**

Competitive intelligence also known as CI is in many ways the most upright style to collect all the requisite information, to dive deep and critically analyze the acquired information, to subsequently use intelligence to come up with a story that can not only come handy to small time businesses, but

the Research & Development personnel as well as the IPR counsels in a given establishment. Patents which a company enjoy having can very much be linked to their progress as a major and thus proving as a legitimate criterion to assess their hold in the market.

### **1.2.8. Patent Portfolio Analysis**

Patent Portfolio Analysis is done to study the patents owned by a company. This company can be one's own company or a competitor organization. Sometimes the portfolio of more than one company can be benchmarked to understand the strength and weakness of portfolio. The patent portfolio analysis can also be done to locate white spaces in company's portfolio and to find new business partners to sell or license out unused IP. Studying patent portfolio involves conducting IP searches for not just the parent company alone but it also includes searching for sister companies including mergers, acquisitions or the likes.

Signicent has access to professional corporate-tree databases to build the entire list of companies and then conduct patent searches.

### **1.2.9. Patent Drafting & Illustration**

Patent drafting is demanded by clients whenever patent filing is to be done at the patent office, that is writing the provisional part of a complete specification. Patent drafting usually necessitates, scripting a meaningful description, sketching all the claims, preparing patent drawings and flow-diagrams, etc. In addition to drafting of a patent, we assist in reviewing the application, in illustration of patents as well as answering office action.

### **1.2.10. IDS (Information disclosure statement) Preparation**

Information disclosure statement also known simply as IDS consists of a complete list of all the prior arts in question: may it be applications or well granted patents, NPL or various publications, or for that matter any other handy information. It is hence the moral obligation of the applicant to reveal all of the prior arts either while filling an application or during the course of litigation of the application, failing which he/she may have to face consequences.

Apart from the above mentioned form the office of USPTO may also ask a reproduce of:

- Each and every foreign patent in question
- Each of the publications, also non U.S. patents and publications unless asked by the Office;
- For each cited pending unpublished U.S. application, the full specifications, and drawings, or for that matter any portion of the application which made it to be listed.

### **1.2.11. Office Action Response (OAR) Preparation**

Once the patent has been published it will be examined by the examiner at Patent Office (like USPTO or others) before it can be granted. Among other things, examiners conduct prior art searching to locate relevant references that can challenge patentability of the application. Often, examiners' may send non final rejection (NFR) to the applicants by citing prior arts to support the rejection. Signicent can help prepare a response to the office action (OA) by understanding why the examiner has rejected the claims.

### **1.2.12. Indian Patent Filing and Prosecution Services**

Signicent can help both Indian and Non-Indian clients to prosecute their patents in India. We can help you 360 degrees, right from the patentability search (idea screening) to patent drafting and illustration (patent writing & drawings) and till the point patent gets granted or prosecuted at Indian patent office.

Signicent can also help in filing PCT application (WO applications) from India that can be useful when one's aim is to target multiple countries (say US, European or Asian countries) in addition to India, from a single WO application.

Some of the services we provide for Indian patent prosecution include:

#### **1.2.12.1. Patent Drafting:**

- Preparing provisional patent application
- Preparing complete patent application

#### **1.2.12.2. Patent Prosecution (Important Forms):**

- Request for examination
- Express examination
- Request for early publication
- Reporting office action with advice
- Preparing and submitting reply to office action
- Submitting details of the corresponding applications
- Reporting letters patent document with maintenance advice

#### **1.2.12.3. Design patents (Forms and Filing):**

- Preparing and filing a design application
- Preparation of drawings, each view
- Claiming priority
- Filing priority document
- Reporting office action with advice
- Preparing and filing reply to office action

- Reporting certificate of registration

### **1.2.13. Trademark and Wordmark Search**

Trademark and Wordmark searches can be extremely important for your brand and image protection. Signicent can conduct trademark and wordmark searches across various national and international trademark offices including US, European and Asian countries, as well as global brand databases.

In addition of conducting searches and reporting the relevant results, we also provide legal status (live or dead) analysis to help our client understand threats properly. Such searches can become important while naming your own brand (to ensure you do not infringe someone else's trademark) and to find infringers who may be using your brand-name to sell his product and thereby willingly or unwillingly deceiving market.

### **1.2.14. Patent Dashboard by Signicent LLP (PatView)**

Signicent's dashboard (abbreviated as PatView™) is an online user-friendly tool that allows you to critically analyze and vividly visualize patents in a whole new dimension. The drive to bring up a platform like dashboard, it ideated from the restrictions and limits that came with the very classical and extensively used "MS Excel" method of typifying the relevant patents. PatView™ dashboard is web based software help/tool that is provided to clients apart from the usual "Spreadsheet reports".

Prominently the perks of using PatView™ are:

- One and only one screen easy steering and exploration among thousands of uploaded relevant patents in a given study.
- Multitudinous-mode and filtration using combinations on one or more criteria of either of the following dates be it application or publication or for that matter priority date, assignee names or country codes.
- The appropriate use of keyword searching for easy listing of relevant results.
- Taxo-based breakup of patents over various nodes.
- Easy to edit and re-hash patents in taxonomy of one's choice.
- Both static as well as dynamic data charts to view trends and corresponding patents as one filters results with own query.
- Easy to incorporate own set of notes as and when one analyzes the results.
- Easy to transfer the shortlisted results in the form of relevant patents in sheet or PDF format for further sharing purposes.

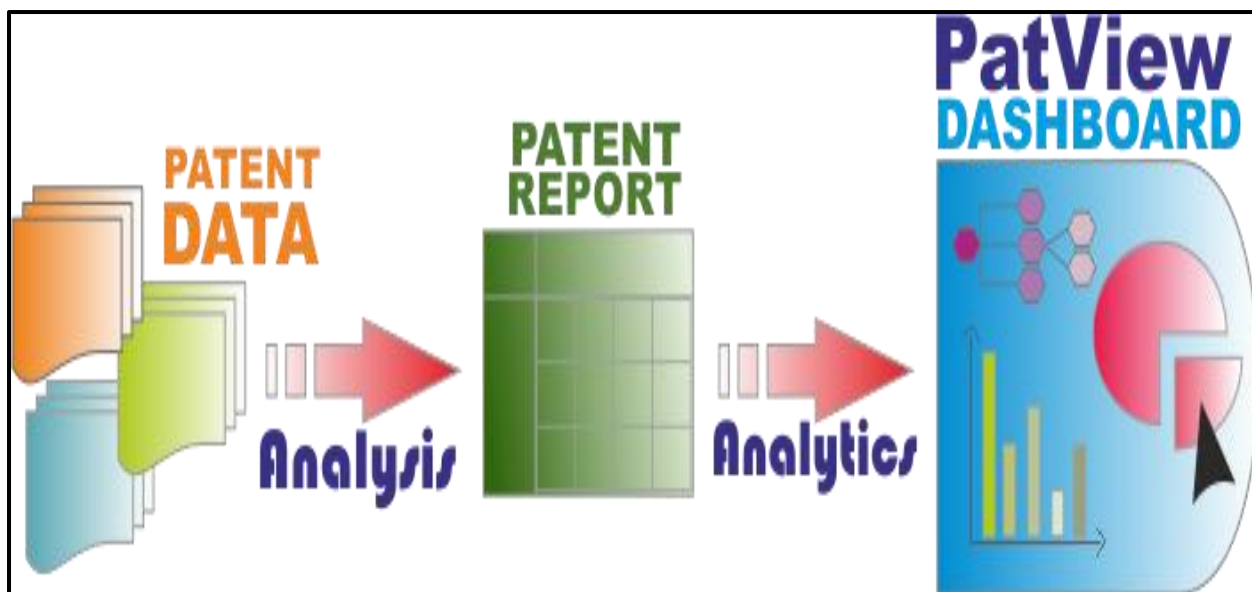


Fig 1.1 Preparation of patent dashboard [2]



## CHAPTER 2

### LITERATURE SURVEY

#### 2.1. PATENT

Patent is a collection of exclusive offensive rights provided by the government of a state say the Patents and Trademark Office, to an inventor of said product, process or service for a bounded period of time, in trade for public declaration of the same. A patent owes the said patentee the full and final right to exclude others from producing, exploiting, or marketing the invention claimed in the patent atleast for about 15 to 20 years excluding the extension period, this period being dependent on the type of patent applied.

##### 2.1.1. Who can apply for patent and what are the requirements?

Whoever may freely apply, regardless of age, gender, caste, color, creed, nationality, mental competency, or any other trait, so long as the said person is the true inventor of the invention in question. Even dead or insane person may apply through their personal representative. It may be sold off as a property owner would for a lump sum amount, or can give it anyone with the prior permission in place to use the invention lest covered in return for royalty payments.

Basic Requirements for validifying a patent are:-

- **Patentable Subject Matter:** The subject of the patent should be eligible for patenting and should meet the standard requirements.
- **Novelty:** A patents shall be novel in nature i.e. it should be different from what is already known to public. Even if the change may be slightest in nature.
- **Non-obviousness:** The new invention should be unobvious. This can be done by showing new and far superior and improved results as compared to already know project.This is done by the person skilled in the same technological field.
- **Usefulness:** The patent has to be useful for the improvement in the society be it a product, process or a service offered.

##### 2.1.2. Types of patents:

###### 2.1.2.1. Utility patent

Utility patent is given to any inventor who invents any new product, process, service or any new composition. It protects the way any product functions and the uses it possesses.

For a process it protects the unique manner in which utilitarian functions. Utility patent is valid for 20 years only. The fees for utility patent include PPA fee, filling fee, maintenance fee and issuance fee. Some examples of utility patent are electronic circuits, new drugs, process modifications, etc.

### **2.1.2.2. Design patent**

Design patents are independent of the functions performed by the object. It can be granted to anyone who invents a new and original ornamental and aesthetic design of the product. It is valid for 14 years only. The fees for design patent include filling fee and issuance fee only. But when the function is inseparable then it will be a utility patent. For example- A supersonic jet fighter's function depends also on its shape therefore it has to be a utility patent. Some examples of utility patent a uniquely designed CPU cabinet or toy, an arrangement of things on page of paper, etc.

### **2.1.2.3. Plant patent**

Plant patents include asexually reproducing plants i.e. flowers. Sexually reproducing plants like by pollination can be protected under plant variation protection act. The plant patent is valid for 20 years only. The fee for taking plant patent will include filling fee and issuance fee only.

Some examples of plant patents:

- Climbing or trailing rose.
- Poinsettia plant named Eckaddis, etc

## **2.2. COPYRIGHT**

Copyright is a set of creative rights provided to the creators of dramatic, literary and artistic works, producers of cinematography films and sound recordings. Other works include photographs, paintings, drawings, writings, screen plays etc. It is important to note that copyright does not include innovative ideas as in case of patents but the very manner in which they are let out.

The lifetime of copyright protection under the copyright act, 1957 is the lifetime of the owner plus 70 years or 95-120 years. The cost of enforcing copyright involves legal representation, administrative or court cost.

Generally copyright is enforced as a civil matter though some jurisdiction does apply criminal sanctions. The copyright laws of every country are standardized by international copyrights agreement, as such they are considered territorial rights and they vary by country.

Copyright law recognizes the right of an author based on whether the work actually is an original creation, rather than considering whether it is unique again against the case of patents. Copyright laws are universally standardized through famous international conventions such as Berne Conventions and Universal copyright convention.

### **2.2.1. Exclusive Rights:**

Several exclusive rights typically attach to the holder of a copyright:

- To reproduce the work and to market the copies
- To buy in or sell out the work internationally
- To create works that reconstruct the original work
- To perform the work in public
- To sell out or surrender rights to others
- To transmit via radio or display by video.

## **2.3. TRADEMARKS**

Trademarks are the any of the name or sign or logo or any kind of symbol or number which becomes representative of the particular brand or an establishment. People actually tend to recognize and follow their favourite brands by their trademarks.

### **2.3.1. Monopoly rights of Trademarks**

The offensive rights of trademarks are unlike that the patents have. The trademark rights are not rigid, they vary in accordance with their uniqueness and diversity.

The trademarks which are randomly made without proper contemplation have much wider scope than the trademarks which describes the function of the product. It is due to the fact that descriptive marks can come close to the words in common usage.

The trademarks have offensive rights until and unless the trademark is not broad and universal. When the mark becomes broad or generic it will elude its offensive rights.

A commonly cited example is that of medicine/pill, the word “aspirin” was at first used as the trademark but very soon became the face for pain killers.

### **2.3.2. Types of trademarks**

- Unregistered trademarks – these are just used for promoting the goods. These are not registered with the government therefore they do not have the offensive rights over them. They are simply written by superscripting “TM” after the said mark.
- Service trademarks – these as the name suggests are used for representing and promoting the service. They are written as “SM” superscript after the mark

- Registered trademarks – these are registered with the government, that’s why they have all the offensive rights against the infringements of trademarks. These are represented by the ® above the mark.

### **2.3.3. How offensive rights to trademarks are acquired?**

If you want to acquire the offensive rights for your trademark then you should follow the following instructions –

- Avoid revealing your mark just like a trade secret till you put it to use
- The trademark used should not be generic or descriptive
- Do make sure that the mark is novel
- Register the trademark
- Start using your trademark
- Market your trademark properly

### **2.3.4. What doesn’t qualify for a trademark?**

- Lengthy written materials
- Any informational slogans
- Immoral things
- Government emblems
- Copycat marks
- Generic words
- Purely geographical locations

### **2.3.5. Trade group registrations-**

When you want to register your trademarks with more than one organization then instead of going to each and every organization go for the specific trade organization. For example if your trademark is for an automobile company then register it under the Automobile Manufacturer’s Association rather than under the PTO. This trade registration is in fact better and easier than the PTO’s procedure.

## **2.4. TRADE SECRET**

A trade secret is an invaluable industry information which is not let out to the general public anywhere in the world. Consistent efforts are made to maintain the covertness. This information can be in any form as in a formulation, compilation, a definite pattern, a computer program, a device,

process or approach. It has its own independent economic potential in the competitive market. Trade secret will forever be safeguarded from utilization by those who use unethical means to get access. If one goes for a patent and intends to instead maintain the said information as trade secret before the grant of a patent, they can register for a Non Publication Request, declaring that it should not be filed anywhere outside.

The most commonly cited example of trade secret is the ever confidential recipe of Coca-Cola formula. Since Dr. John S. Pemberton formulated the recipe of Cola in 1886, the formula has been kept a close secret ever since, only shared with a small group and never ever written down on paper.

#### **2.4.1. Trade secret versus patenting-**

Advantages:

- It is inexpensive as compared to patents i.e., there is no need to pay any kind of fees for keeping trade secret a secret.
- If not ever disclosed or discovered it will last forever unlike patents where the term is of 20 years.

Disadvantages:

- Trade secret cannot be maintained once it is discovered either by dissecting, inspecting or analyzing the product. This is the major disadvantage because one loses the monopoly over product forever.
- To maintain the confidentiality of a trade secret, discretion must be necessarily taken and continually implemented.

### **2.5. INDUSTRIAL DESIGN**

Industrial Design is basically the fancy part of a given useful item. It makes the same appealing to consumers, thus enabling it be sold easily as well adding to its trade potential. A design can have 3D features including the exact style and makeup of an article, or for that matter its 2D features, like lines, designs, patterns and colors. The design features are utilized in the said article by any artificial means because of which the elements in the finished product appeal to the viewers. The decorative and inoperative aspects of an industrial product that appear due to designing can be protected if the industrial designs are found to be novel, also applicable to a utilitarian article and non-obvious.

Industrial designs should be compulsorily filed as early as possible before revealing it to the public. If disclosed earlier, novelty of the design will be definitely lost. Owner of the registered design can exclude others from making, importing and selling the design. In general 10 to 25 years period of protection is granted for an industrial design.

#### **2.5.1. Advantage of protecting industrial designs:**

- Protection of industrial encourages creativity in the manufacturing and industrial sectors, which leads to an expansion in commercial activities.

## CHAPTER 3

### MATERIALS AND METHODS

Generally two types of searches are performed in any IPR firm.

- Patent search
- NPL (Non-patent literature) search

Patent search is performed on free *databases using keywords*. *Class based* and *sequence search* can also be done to find a patent. Sequence search is particularly useful in life sciences to find a patent disclosing the desired sequence (e.g. a nucleotide sequence).

#### 3.1. Objective-

To find out prior art (Patent & Non- Patent literature) to challenge of the below mentioned features of the invention disclosure:

- A process for preparing steviol glycoside compositions
- The Leaves of *Stevia rebaudiana* contain RebM in an amount above the common relative concentration of RebM
- A solvent which is water
- Mixing the leaves of *Stevia rebaudiana* with the solvent to extract the steviol glycosides contained in the leaves
- Removing the leaves of *Stevia rebaudiana* so as to get *Stevia* extract solution comprising RebM
- Whereby RebM is found in the solution above its common relative concentration; and wherein for RebM the common relative concentration is 1.4%.
- Purification of the *Stevia* extract solution and subsequent drying
- *Stevia* extract so obtained with total steviol glycoside content of minimum 6.9% (wt/wt)
- Application of *Stevia* Extract in Food & Beverages

Table 3.1 Term sets

TERM	SYNONYMS USED
<i>Stevia Term Set</i>	(Steviarebaudiana) OR (S. rebaudiana) OR (candylea+) OR (sweetlea+) OR (sweet lea+) OR (sugarlea+) OR (sweet weed) OR (sweet plant) OR (honey grass) OR (sweet herb) OR (sweet honey lea+) OR (Eupatorium rebaudianum) OR (sweet herb of Paraguay) OR (stevi+) OR (stevia sweetner?) OR (stevia extract)
<i>Glycoside Term Set</i>	(Glycoside?) OR (stevi+ glycoside?) OR (glucoside) OR (stevi+ glucoside?) OR (strophanthin) OR (alkylglycoside) OR (alkyl glycoside) OR (alkaloid glycoside) OR (glycoside residue)
<i>RebM Term Set</i>	(RebM) OR (Rebaudioside M) OR (rebaudioside X) OR (rebiana) OR $\beta$ -D-Glucopyrnosyl(1-2)[ $\beta$ -D-glucopyranosyl(1-3)]1-O-[(5 $\beta$ ,8 $\alpha$ ,9 $\beta$ ,10 $\alpha$ ,13 $\alpha$ )13 { [ $\beta$ -D-glucopyranosyl(1-2)[ $\beta$ -D-glucopyranosyl(1-3)] $\beta$ -D-glucopyrnosyl]oxy}; 19-oxo kaur-16-en-19-yl] $\beta$ -D-glucopyranose

<b>Food Term Set</b>	(Food?) OR (food product?)OR (beverage?) OR (flavored ice tea) OR (juice?) OR (flavor+ milk) OR (yoghurt) OR (sport? drink) OR (non acidified tea?) OR (chewing gum) OR (carbonated beverage?) OR (table top sweetner?) OR (non alcoholic beverage?) OR (soft drink?)
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Table 3.2 Classes

<b>IPC/CPC CLASS</b>	
<b>CLASSES</b>	<b>DEFINITIONS</b>
<b>C07H1/08</b>	Chemistry>>organic chemistry>>sugars and derivatives thereof>>Methods for the production of varied derivables of sugars>>Separation; Purification>> <b>from natural products</b>
<b>A01H5/12</b>	Human necessities>>agriculture>>new plants or processes for obtaining them>>products>>Angiosperms distinguished not by their botanical taxonomy>> <b>Leaves</b>
<b>A23V2250/262</b>	Human necessities>>foods and/or foodstuffs>>marking scheme related to foods, foodstuffs or non-alcoholic beverages>>food ingredients>>Sugarless/sugarfree sweeteners>> <b>Stevioside</b>

### 3.2. Patent search on free data bases-

- Advanced Google Patents
- Espacenet
- WIPO
- US PTO-For US Patents

Area of Search-Stevia Extracts in Food and Beverage Compositions

#### 3.2.1. Advanced Google Patents

**Google Patents** is a convenient user-friendly browser from the tech giant Google that catalogues patents as well as patent applications from various patent offices worldwide namely the United States Patent and Trademark Office (USPTO), European Patent Office (EPO), World Intellectual Property Organization (WIPO), Deutsches Patent und Markenamt (DPMA), Canadian Intellectual Property Office (CIPO), and China's State Intellectual Property Office (SIPO).

These documents entail the whole set of granted patents as well as published patent applications from each database (which belong to the public domain). US patent documents and databases antecedes back to 1790, while EPO and WIPO as old as 1978.



Optical character recognition (OCR) performed on the older US patents now enables them to be easily searchable and available while Google Translate facilitates all foreign patents to make the English translations searchable.

**Key words:** (Stevia rebaudiana) (plant) (steviol glycosides) (food) (beverage) (solvent ) (Purification ) (rebm)

The screenshot shows the Google Advanced Patent Search interface. At the top, the Google logo is on the left, and the title 'Advanced Patent Search' is in the center. Below the title, there are several search options: 'Find results with all of the words', 'with the exact phrase', 'with at least one of the words', and 'without the words'. The search bar contains the text 'Stevia Extracts in Food and Beverage'. To the right of the search bar, there is a dropdown menu showing '10 results' and a 'Google Search' button. Below the search bar, there are several filter categories: 'Patent number', 'Title', 'Inventor', 'Original Assignee', 'Current U.S. Classification', 'International Classification', 'Cooperative Classification', and 'Patent type/status'. Each category has a description and a corresponding input field. The 'Date' filter has radio buttons for 'Return patents anytime', 'Return patents between' (with date pickers), and 'Restrict by filing date' / 'Restrict by issue date'.

Fig 3.1. Advanced Patent Search Interface [3]

The screenshot shows the Google search results page. At the top, the Google logo is on the left, and the search bar contains the text 'Stevia Extracts in Food and Beverage Compositions- Title Objective To'. Below the search bar, there are navigation links for 'All', 'News', 'Images', 'Shopping', 'More', 'Settings', and 'Tools'. The search results section shows 'About 112 results (2.20 seconds)'. A warning message states: '"leaves" (and any subsequent words) was ignored because we limit queries to 32 words.' The first result is titled 'Processes of purifying steviol glycosides' and is from 'www.google.co.in/patents/CA2857085A1?cl=en'. The abstract reads: 'App. - Filed 30-Dec-2011 - Published 05-Jul-2012 - Yong Luke ZHANG - Glg Life Tech Corporation. A process for producing the natural sweetener composition which comprises at ... least one of the extracts; preparing feed liquid comprising at least 20mg/mL ... food ... the methods for extracting Stevia rebaudiana glycoside also mainly focus on ... and STV: there is still no good purification method for the selective extraction ... Overview · Related · Discuss'. The second result is also titled 'Processes of purifying steviol glycosides' and is from 'www.google.co.in/patents/WO2012088598A1?cl=en'. The abstract reads: 'App. - Filed 30-Dec-2011 - Published 05-Jul-2012 - Yong Luke ZHANG - Glg Life Tech Corporation. A process for producing the natural sweetener composition which comprises at least one of steviolbioside ( STB ) extract, Rebaudioside B extract and ... Overview · Related · Discuss'.

Fig 3.2. Results on the Advanced Patent Search Interface [4]

### 3.2.2. Espacenet

**Espacenet** is a freely available web-based service for accessing patents and patent applications. It was formulated in 1998 by the European Patent Office (EPO) in collab with the member states of the European Patent Organization. Most member states afford to get the their service in their own language, and access to the EPO's worldwide database, mostly in English. Espacenet worldwide service claims to have records of more than 110 million patent documents.[5]

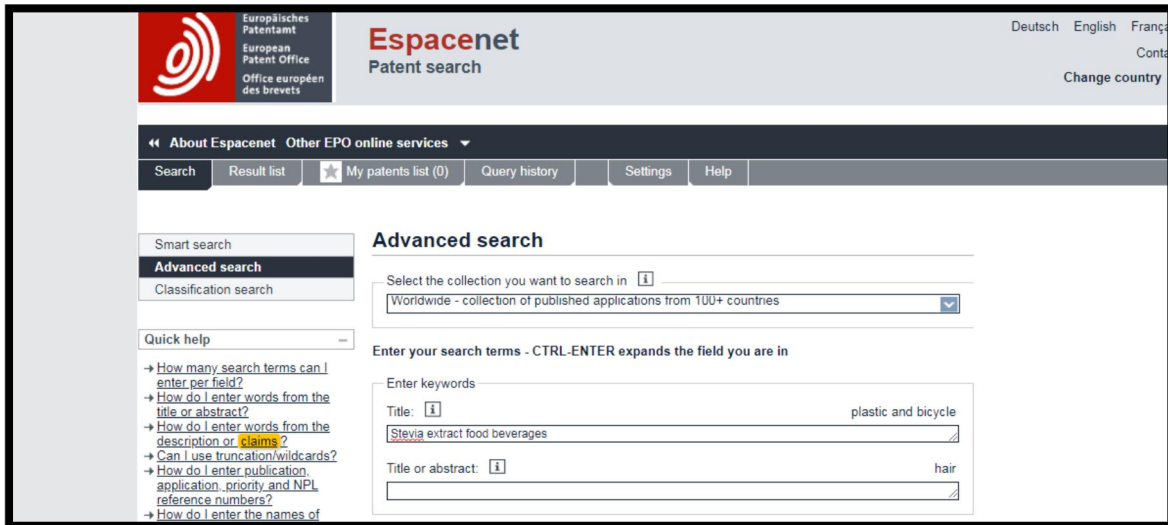


Fig 3.3.

Fig 3.3 Espacenet Interface [6]

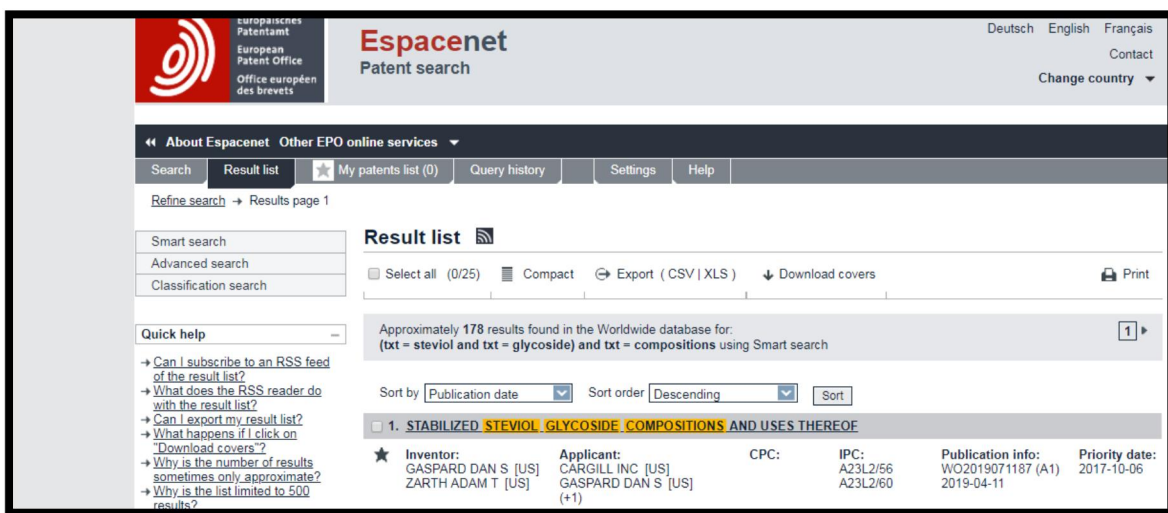


Fig 3.4. Results on the Espacenet Interface [7]

### 3.2.3. WIPO

**World Intellectual Property Organization (WIPO)** is one of the coveted 17 notable agencies of the United Nations. WIPO was brought to existence in the year 1967 "to engage and bring in

creative activity, to encourage the much-needed preservation of IP all across the globe. WIPO forthwith houses a total of 188 member states, executes 26 international treaties, and has its nerve centre in Geneva, Switzerland. The present Director-General is Francis Gurry, who joined the office on 1<sup>st</sup> October 2008.

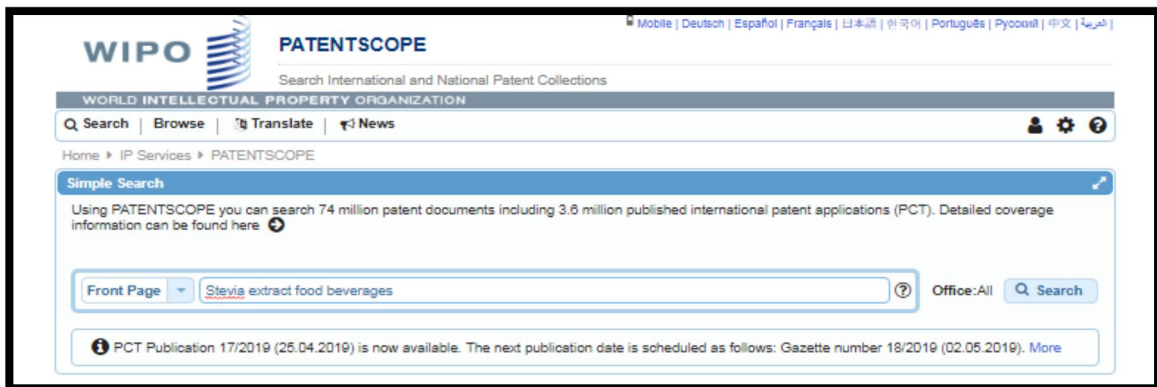


Fig 3.5.

Fig 3.5 WIPO Patentscope Interface [8]

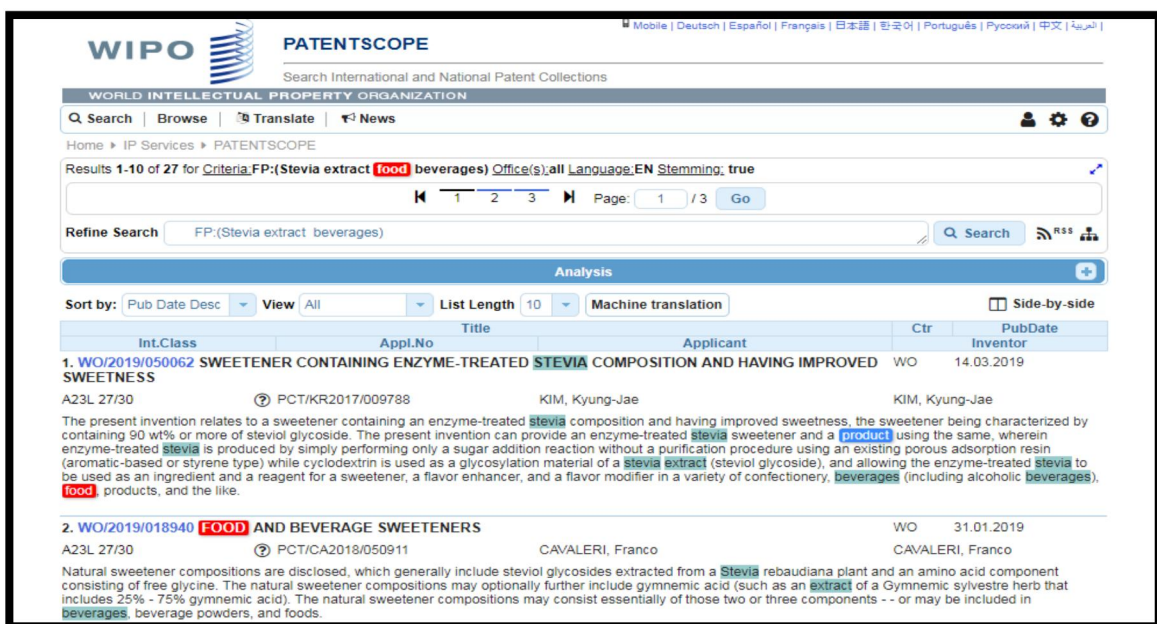


Fig 3.6.

Fig 3.6 Results on the WIPO Patentscope Interface [9]

### 3.2.4. US-PTO-

**United States Patent and Trademark Office** (also called as **PTO** or **USPTO** in short) is an office in the U.S. Department of Commerce that disseminates patents to individual inventors and corporate firms for their inventions, and trademark registration for product and intellectual property identification. The USPTO is singular among different agencies in the sense that it functions chiefly on the money collected as fees from its end-users and not on taxpayer hard-earned money. Its functioning is similar to a enterprise as it receives demand for services in the form of applications

seeking patents and trademark registrations and in turn claims fees to cover the cost of performing the services it readily offers.

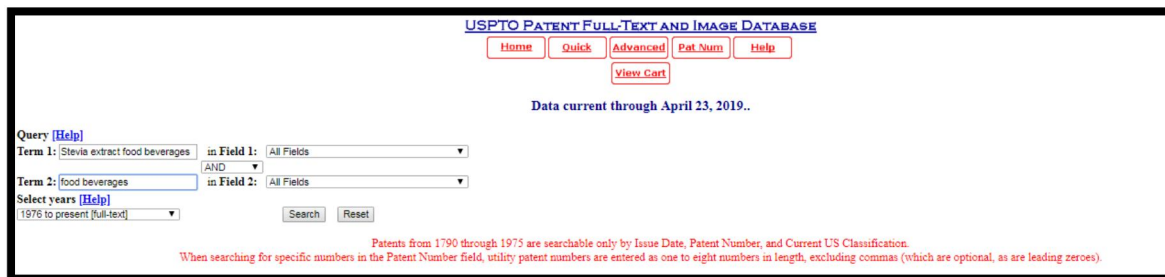
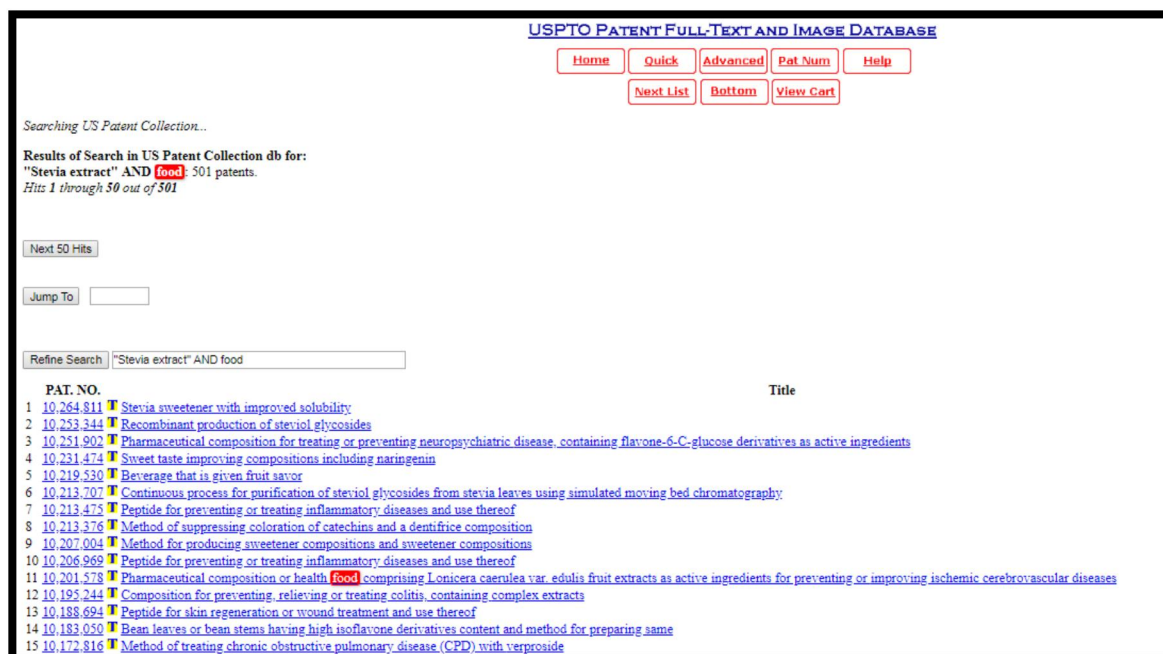


Fig 3.7.

Fig 3.7 US-PTO Interface [10]



Fig

3.8.Results on the US-PTO Interface [11]

### 3.3. NPL (Non Patent Literature) searches-

Non patent literature relates to those records and publications that are not patents or published patent applications, but are cited as references for being relevant in a patent prosecution. For instance, a magazine article or a newspaper cutting or an old video claiming relevance to the invention can be cited as non-patent literature.

References cited in an application are grouped into domestic patents and patent application publications; foreign patents; and non-patent literature.

The free databases for NPL are -

- Google Scholar
- Science Direct
- PubMed Central (PMC)
- PubMed/ Medline

Table 3.3. Non Patent Literature searches

S.NO	NPL STRINGS USED	NO. OF HITS
<b><i>Google scholar</i></b>		
1	(S. rebaudiana OR Stevia rebaudiana) AND (plant extract) AND (steviol glycosides) AND (beverage) AND (solvent) AND (purification) AND (rebm OR rebaudioside M))	373
2	(Stevia rebaudiana) AND (extract) AND (steviol glycosides) AND (beverage) AND (solvent) AND (purification) AND (rebm)	64
<b><i>Science Direct</i></b>		
3	(Steviol glycosides) (solvent) (extract)	295
4	(Steviol glycosides) (purification) (rebaudioside)	130
5	(Steviol glycosides) (beverage) (extract) (rebaudioside m OR rebM)	106
<b><i>PubMed Central</i></b>		
6	(Stevia) AND (rebaudioside m) AND (beverage)	9
7	(steviol glycosides) (beverage) (extract) (rebaudioside m OR rebM)	5
<b><i>Pubmed</i></b>		
8	(Steviol glycoside) AND (rebaudioside) AND (food)	117
9	(Steviol glycoside) AND (beverage)	47

## CHAPTER 4

### RESULTS AND DISCUSSION

*Relevant Patent- EP3189065A1*

TITLE	PUBLICATION DATE	FILING DATE	PRIORITY DATE	INVENTORS	ASSIGNEE
<b>Stevia extracts enriched in rebaudioside d, e, n and/or o and process for the preparation thereof</b>	JULY 12, 2007	AUG 27, 2015	SEPT 02, 2014	AvetikMarkosyan	<b>PureCircleUSA Inc</b>
<b>ABSTRACT</b>					
A Stevia extract made from leaves of the Stevia rebaudiana plant is described. The extract has desired levels of steviol glycosides wherein any one or more of Rebaudioside D,E,N,O is present at a higher concentration and is useful in food, beverage, and other consumable products.					
<b>RELEVANT TEXT</b>					
<b>Claims:</b>					
<ol style="list-style-type: none"><li><b>1. A process for preparing a steviol glycoside composition</b>, comprising the steps of:<ol style="list-style-type: none"><li>a) providing Stevia rebaudiana leaves, wherein Stevia rebaudiana leaves comprise at least one steviol glycoside selected from the group consisting of RebD, RebE, RebN, and RebO, wherein any one or more of RebD, RebE, RebN or RebO is present at or above its common relative concentration;</li><li>b) providing a solvent comprising water;</li><li>c) contacting the Stevia rebaudiana leaves with the solvent to extract the steviol glycoside from the leaves; and</li><li>d) separating the Stevia rebaudiana leaves to obtain a Stevia extract solution comprising at least one steviol glycoside selected from the group consisting of RebD, RebE, RebN, and RebO, wherein any one or more of RebD, RebE, RebN or RebO is present in the solution at or above its common relative concentration;</li></ol>wherein the common relative concentration for RebD is 2.4%, for RebE is 1.0%, for RebN is 1.6%, and for RebO is 0.8%.</li><li><b>2. The process of claim 1 further comprising purification of the Stevia extract solution and drying to obtain a Stevia extract with total steviol glycoside content of at least 6.9% (wt/wt on dry basis).</b></li></ol>					

5. An untreated aqueous Stevia extract prepared by the process of claim 1 , **wherein RebM is present in the extract at or above its common relative concentration.**

6. **A food, beverage or other consumable comprising the Stevia extract of claim 5.**

**Description:**

In a particular embodiment **the relative concentration of RebM in dried leaves of new Stevia rebaudiana cultivar is at least 1 .4%.**

**DISCUSSION**

**This patent discloses the Stevia extract compositions and uses of the same in food and beverages. It covers almost all the key features as in the requirement, hence is considered as a patent of high relevancy.**

*Relevant NPL result*

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Development of Next Generation Stevia Sweetener: Rebaudioside M. [11]

## CHAPTER 5

### CONCLUSION

Summary: Based on our technology, we have done searches on patent databases which include Google patents, USPTO, J-PlatPat, WIPO Patentscope, Orbit and Non-patent databases including Google. Our searches were based on semantic type, keyword as well as classes. We have filtered our results based on basic idea of technology i.e. **Method of preparing steviol glycoside compositions and their use in foods and beverages** and have shown the most relevant one in EP3189065A1 which covers all the technological points mentioned in our requirement.

Conclusion: With the aforementioned discussions, it can be concluded that the references found cover nearly all the mentioned features in the requirement and hence sufficient to break the novelty.



