Patent Searching & Analysis
MT5912

Loh Mee Lan
12 Feb 2019
Learning Outcomes

- Patent Searching
  - Introduction to IP & patents
- How to read a patent document
- How to conduct effective patent searches in Patsnap
- Introduction to patent analysis
  - Patsnap Insights
  - Patsnap Landscape Maps
Introduction to Intellectual Property (IP) & Patents

Ms Loh Mee Lan
Senior Librarian
NUS Libraries
Introduction to IP & Patents

What are the types of IP found in such products?

- **Trademarks** – apple logo, “Iphone”
- **Registered designs** – aesthetic appearance (shape of the phone)
- **Patents** – Functional features
- **Layout design of ICs**
- **Copyright** (embedded operating system and other software)

Photo: Pixabay.com
Introduction to IP & Patents

• Patents is one form of intellectual property (IP)
• Other forms of IP include copyright, registered design, trademark, etc.
• For more information, go to Patent Libguide (FAQ section).

http://libguides.nus.edu.sg/patents
How to Read a Patent Document

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**HOW to Read a Patent Document**


**References Cited**
Find related patents, what improvements have been made

**Classification Numbers**
“Patent classification is a system of sorting inventions and their documents into technical fields covering all areas of technology.”


See also Patsnap Libguide on how to search patent classification [http://www.lib.nus.edu.sg/lip/pat/gui/Patsnap_Classification_Search.pdf](http://www.lib.nus.edu.sg/lip/pat/gui/Patsnap_Classification_Search.pdf)
Claims

- Defines the legal boundaries of protection
- Usually starts with phrases like “I claim”, “We claim”, What is claimed is”, “The invention claimed is”

- Independent Claims
  “Generally an independent claim is one that does not refer to any other claim. Some independent claims may refer to other claims....”

- Dependent Claims
  “A dependent claim can depend upon one or more independent claims or one or more dependent claims....”

Source: “Independent And Dependent Claims”
Suggestions on how to read a patent effectively:

- **Front page**
  - Title, patent type, publication/grant dates
  - Abstracts

- **Specifications**
  - Background of the invention
  - Summary of the invention

- **Claims**

Patents Libguide : FAQs
http://libguides.nus.edu.sg/patents
Exercise

- Go to Google Patents

- Search for any 2 patents on a topic of your choice
- 1\textsuperscript{st} Patent – Read (1) Title (2) Abstracts (3) Claims
- 2\textsuperscript{nd} Patent – Read (1) Claims (2) Title (3) Abstracts
- Which approach works best for you? Which is clearer?

- Anything else you found that are interesting?
Patent Searching

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Patent Searching – Introduction

• Why Search for Patents
  • Point out new directions in research
  • Generate ideas for projects/research
  • Reduce wastage on duplicating research
  • Gain access to a wealth of technical information not published anywhere else
  • Don’t search patents only as last part of the research process
Patent Searching – Introduction

NUS: Invention Disclosure Form (Refer to [ILO Website](#))

### IV. DETAILS OF THE INVENTION

15. **Overview** – Provide a summary or general description of the invention including its field of application.

17. **Novelty & Unobviousness** – List the features of this invention that make it a substantial and significant improvement, or the case of new and unexpected results, over existing technology (i.e., methods, devices and/or materials). Indicate what are the unique benefits or advantages these features provide.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit/Advantage</th>
</tr>
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18. **Limitations** – Describe the limitations, if any, of this invention in terms of, for instance, scalability, speed, power consumption, efficiency, use of exotic compounds, etc.

19. **Prior Art** – List any other existing technologies or literature that more closely resemble the features and/or functionalities of this invention. Indicate how this invention differentiates from existing technologies or literature listed.

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[1] ILO Website
Approaches to Searching Patents

**Topic Search**
- Start broadly... using Synonyms, Truncations, wildcards variations,
- Refine with additional keywords, classification numbers, etc.

**Single Document Search**
- Start with a known patent document
- Find other patents with patents using relevant classification numbers, citations analysis, references (including non patent literature), etc.

**Semantic Search**
- Using text or patent number

**Classification Search**
NUS Libraries Patent Libguide
(http://libguides.nus.edu.sg/patents)

- Subscribed databases
  - Patsnap
  - Inspec, etc.

- Free databases on Internet
  - Google Patents
  - The Lens
  - PATENTSCOPE, etc.
How to Access Patsnap

Access Patsnap via NUS Portal (http://lib.nus.edu.sg)
Search By Patent Document

Search A Patent Document (US4267038)

- Identify suitable classification codes
- Use “More Like This” function
- Find Citations (Cites or Cited By)
- Search Assignee(s) or Inventor(s)
HOW to Search Patents Effectively

References / Citations

US4267038

Additional Help from Patsnap:

Citation Analysis
HOW to Search Patents Effectively

Semantic Search
- Using machine learning algorithm to find relevant patents
- Note: Only up to 1000 patents retrieved.

- Search Example
  - Patent Number (e.g. US9315403)
  - Journal article
  - Website, etc.
How to Search Patents Effectively

Semantic Search
Abstract
Algae is a well-known organism that its characteristic is prominent for biofuel production and wastewater remediation. This critical review aims to present the applicability of algae with in-depth discussion regarding three key aspects: (i) characterization of algae for its applications; (ii) the technical approaches and their strengths and drawbacks; and (iii) future perspectives of algae-based technologies. The process optimization and combinations with other chemical and biological processes have generated efficiency, in which bio-oil yield is up to 41.1%. Through life cycle assessment, algae bio-energy achieves high energy return than fossil fuel. Thus, the algae-based technologies can reasonably be considered as green approaches. Although selling price of algae bio-oil is still high (about $2 \text{ L}^{-1}$) compared to fossil fuel’s price of $1 \text{ L}^{-1}$, it is expected that the algae bio-oil’s price will become acceptable in the next coming decades and potentially dominate 75% of the market.
Food Salvage

Today we find food wastage and hunger with malnutrition exist side by side in our world. There are many causes of food wastage—from post–harvest mismanagement, to damage during transport, to rejection of ugly food, to leftover unsold food. However, one type of wastage is particularly painful: wastage of cooked food. The biggest problem with utilization of cooked food is that as soon as it is ready, the clock of microbial growth starts ticking until a point few hours later, when it is fully spoilt and inedible. This time restriction necessitates quick redistribution of food before its spoilt, thus limiting how much can be used and how fast it can be done.

The desired solution would challenge the time restriction imposed on cooked food. There are numerous technologies and methods that are currently employed to preserve food. For example, taking rice as the primary use case, there is a way to slow down the growth of microbes, but then to go beyond that to process, sterilize, fortify and repackage the cooked rice to extend its shelf life to 1–2 years.

The team will need to identify frugal ways to preserve cooked food and to turn them into a viable form that can be used elsewhere. These may be feed to livestock, or as a product that can be a cheaper source of nutrients for poorer parts of society. It could even be used in disaster zones and areas of humanitarian emergencies where fresh food availability is limited.
### Keywords Searching – Search Operators

<table>
<thead>
<tr>
<th>Operator</th>
<th>Explanation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>AND</td>
<td>2 keywords must be found in document</td>
<td>apple AND orange</td>
</tr>
<tr>
<td>OR</td>
<td>Either keywords found in document</td>
<td>apple OR orange</td>
</tr>
<tr>
<td>NOT</td>
<td>1st keyword must be found but exclude 2nd keyword</td>
<td>apple NOT orange</td>
</tr>
<tr>
<td>“” “”</td>
<td>Keywords within quotation marks must be next to each other in the order specified</td>
<td>“apple juice”</td>
</tr>
<tr>
<td>( )</td>
<td>Using parentheses to define search order</td>
<td>(apple OR orange) NOT juice</td>
</tr>
<tr>
<td>*</td>
<td>Replace a string of characters</td>
<td>function*</td>
</tr>
<tr>
<td>$Wn</td>
<td>Search words within “n” words of each other, in any order</td>
<td>vitamins $W5 nutrients</td>
</tr>
<tr>
<td>$WS</td>
<td>Search words within SAME sentence</td>
<td>vitamins $WS nutrients</td>
</tr>
</tbody>
</table>

Go to Search Helper for more tips: [Search Syntax Tab](#)
Keywords Searching – Search Statements

Query:

(cooked $W5 food) AND (microbial OR microbes) AND “shelf life” AND (prolong OR extend)
Retrieved > 3150 documents

Review Search Statement

(cooked OR preserved) AND food AND (microbial OR microbes) AND “shelf life” AND (prolong OR extend)
Retrieved > 30,000 documents
Classification Search

- Within a document
- Using Classification Manual

Additional help
- Patsnap: Patent Classification Search (available in Patent Libguide)
Classification Search

Note:
- Classification codes may be revised over time
- Classification codes may not be consistent as they are assigned by different patent offices
- Some patent office does not use the full classification code e.g. A23L7 instead of A23L7/10
HOW to Search Patents Effectively

Beware of "naïve" keyword searches!

Patent jargon is used to broaden scope of the patent.

Sometimes the applicant simply doesn't want his application to be found.

Additional Help:
- Patsnap: Quick Guide on alert, save search query and workspace

Patsnap Website
- Workspaces
- How Do I manage my email alerts?
Exercise

- Identify the keywords or key concepts from your research topic
- Identify possible search terms and write your search statement
- Search in Patsnap
- Look at the classification codes for the patent document. Is it relevant? Can you find other related documents?
Patent Analysis

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Patent Analysis

- Broad overview of the technology
- Identify trends
- Who are the major companies/institutions

Remember!!
Patent analysis forms part of the overall analysis about the market/technology

Combine with business information, current affairs, non patent literature, etc. to get a more accurate view.
Patsnap Insights

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Patsnap Insights

Patsnap Insights provides business intelligence information. You can assess opportunities and threats, find valuable information, about the company or technology, etc. The data is based on information extracted from Patsnap database.

2 Types of Dashboards
- Technology
- Company

How to Access
- From Search Results Sets (Patsnap)
- Workspace (Patsnap)
- Direct from NUS Libraries Portal
Patsnap Insights

Additional Help
- Quick guide on finding company information
- Quick guide on finding technology information

Patsnap Website
- Additional Help on Patsnap Insights
Patsnap Landscape Maps

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How the patents are organized:
- “patent analysis algorithms to create what is essentially a self-organising map”
- “Similar patents are positioned closer together, and different patents are spaced further apart”
- “the mountains, where patents will be clustered, represent areas of high activity and the low lying areas represent lower levels of patent activity”
- Clusters based classification codes and semantic analysis of keywords (title/abstracts)

Sources: Patsnap Help: [Using The Landscape Tool](#) & [How are patents assigned to each category in Landscape](#)
Patsnap Landscape

Additional Help (from Patsnap Website):
- Help on Landscaping

How to Access
- From Search Results Sets
- Workspace
Patsnap Landscape Maps

- See the “forests” (big picture/overview)
- Landscape maps based on the set of documents retrieved
- Is accurate as of today (legal status will change, new patents are published, etc.)
- Lastly....
  - Store your relevant patents in workspace
  - Set up alerts to keep updated.....
Thank you for attending today!

Please fill in the feedback form:


Please contact me if you have further queries:

Loh Mee Lan
Email: lohmeelan@nus.edu.sg
Additional Search Tips

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Additional Search Tips – Business Sources

See Marketing Libguide for more info
Different Patent Classifications

There are different classification systems adopted by various countries:

- **International Patent Classification (IPC)** – This is most common system

- **Cooperative Patent Classification (CPC)**

- **International Classification for Industrial Designs (Locarno Classification)**

- Etc.
International Patent Classification

The IPC system

Patent documents are classified according to different classification systems depending on the patent granting authority concerned. The most important classification system is the International Patent Classification (IPC).

Introduced in 1986, the IPC is used by all patent offices worldwide, some of which also use a national classification system. The IPC has a hierarchical structure and is subdivided into sections, classes, subclasses, groups and subgroups. One of the most precise classification systems available, the IPC currently divides technology into around 70,000 sub-areas.

Areas of technology

In the IPC, the technology is divided into eight main sections:

- A Human Necessities
- B Performing Operations; Transporting
- C Chemistry; Metallurgy
- D Textiles; Paper
- E Fixed Constructions
- F Mechanical Engineering; Lighting; Heating; Weapons; Blasting Engines or Pumps
- G Physics
- H Electricity

# International Patent Classification

## IPC divisions

The IPC has a systematic and hierarchical structure. Classification becomes more detailed with every further (sub)division, as you can see in this example:

<table>
<thead>
<tr>
<th>Level</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
<td>A</td>
<td>Human necessities</td>
</tr>
<tr>
<td>Class</td>
<td>A21</td>
<td>Baking; edible doughs</td>
</tr>
<tr>
<td>Subclass</td>
<td>A21C</td>
<td>Machines or equipment for processing doughs</td>
</tr>
<tr>
<td>Group</td>
<td>A21C1</td>
<td>Mixing or kneading machine for the preparation of dough</td>
</tr>
<tr>
<td>Subgroup</td>
<td>A21C1/06</td>
<td>With horizontally-mounted mixing or kneading tools</td>
</tr>
</tbody>
</table>