RESEARCHER unbound

PATENT SEARCHING: LEARN EFFECTIVE SKILLS

By

Patent Team
NUS Libraries & ILO
What is Researcher Unbound

Research Cycle

IDEATION
Get your literature review done
Do a literature search

LOTS of information
Organise and manage

WIDEN REACH

WRITE, PUBLISH and PROTECT your idea
If you are starting on your research and need some help in the research process, we are here to help you. Come join us at the Researcher Unbound (RU), a series of workshops aimed at helping researchers like you discover and grasp essential skills such as literature searching, referencing and publishing your research work.
Powerpoint Presentation

http://libguides.nus.edu.sg/patents

Section on “Guides, Tutorials, etc.”

Guides, Tutorials, etc.

- How to conduct patent searches for medicines: a step-by-step guide
  
  This 2010 World Health Organization (WHO) publication gives a detailed guide to searching patents on medicine.

- Patent Tutorial: Learn Effective Skills (3 March 2017) (Powerpoint Presentation)


No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, without the written permission of the copyright holder, application for which should be addressed to the author. Such written permission must also be obtained before any part of this publication is stored in a retrieval system of any nature.
Outline

► Introduction to Patents & Overview of Patent Filing in NUS
► Patent Searching
► How to Read a Patent
  ► Classification Search & Topic Search
    ► Patsnap
  ► Internet Source
Introduction & Brief
Overview of Patent Filing in NUS

DR TIMOTHY PHUA, MANAGER
INDUSTRY LIAISON OFFICE
Outline

- Intellectual Properties
  - Overview
  - Alternatives besides patents
- What to do?
  - Things to know
  - Best time to approach ILO
- Challenges
  - Time commitment
  - Difficulties that researchers usually face
Outline

What is Intellectual Property?

“Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.”

Source: http://www.wipo.int/about-ip/en/

- IP protected in law - patents (utility and design), copyright, IC layout design and trademarks
- Trade-secret, know-how
WHAT PROTECTION PATENT OFFERS?

- It does give you the right to exclude others from doing so
- During the time a patent is in place, a patent holder or licensee can exclude competitors from making and selling products similar to the patented idea of invention.
- The inventor gives the public a full and complete disclosure of the invention with a teaching of how it works.

http://enterprise.nus.edu.sg/technology-commercialisation/for-researchers/about-patents
WHAT MAKES AN INVENTION PATENTABLE?

- **Novelty**
  - The invention must be new and original. An invention is not considered novel if it has been known, practiced, published, or disclosed by others anywhere in the world before the date the invention was filed by the applicant.

- **Utility**
  - The invention must be useful, i.e., it must have a practical application

- **Non-Obviousness**
  - The invention must not, at the time it was filed, be considered obvious to a person of “ordinary skill” in the field of the invention.

http://enterprise.nus.edu.sg/technology-commercialisation/for-researchers/about-patents
What to do? Challenges?

- **UNDERSTAND YOUR INVENTION**
  - Status of invention
  - Landscape
  - Learn to do search

- **UNDERSTAND WHY YOU ARE DOING YOUR SEARCH**
  - Scientific
  - Commercial - “White space”, defensive

- **SUBMITTING INVENTION DISCLOSURE FORM TO ILO**
  - Do your preliminary search
  - Discuss with ILO before submitting

- **PATENT PROSECUTION IS A LONG AND EXPENSIVE PROCESS**
  - Time commitment
  - Reasons to continue to maintain the patent
Patenting and Commercialization

- WHERE TO GET INVENTION DISCLOSURE FORM?
  - Please complete the document

- PROVIDE AS MUCH INFORMATION AS POSSIBLE
  - Funding sources
  - Inventors/collaborators
  - Publications or intended publication dates
  - Technical write-up of the invention
  - Leads and contacts to companies

- DUE DILIGENCE
  - Patentability
  - Commercial viability

- COMMERCIALIZATION
  - Marketing to companies
  - Licenses, research collaborations, spin-offs, etc.
Where to get it?

http://enterprise.nus.edu.sg/

“Technology Commercialisation” Tab -> Select “For Researchers”
Select “Disclosing An Invention”
Patent Journey

**FILING PCT - WHY?**
- Differing payment for filing national patents
- Gestation period & Grooming start-up/spin-off Company
- Time for additional research
- Time to search for licensees/collaborators/investors
- Time for marketing research

**PATENT OFFICE ISSUES**
- International Search Report (ISR) provides an indicator of the patentability of the patent application
- Written Opinions (WO) provides detail opinion on cited references/prior art against patent application from Patent Office

**AFTER PCT – NATIONAL PHASE ENTRY**
- Entering into individually countries
- Not the end – office actions, renewals fees, etc
Takeaway

- TYPES OF INTELLECTUAL PROPERTIES
- UNDERSTANDING YOUR INVENTION
- UNDERSTANDING WHY YOU ARE DOING YOUR SEARCH
- NUS IP PROCESS
  - OTHER TYPES OF INTELLECTUAL PROPERTIES
- PATENT PROSECUTION IS A LONG AND EXPENSIVE PROCESS
- LAB TO MARKET IS A MARATHON
Patent Searching

STEPHANIE BUDIMAN
SCHOOL OF DESIGN & ENVIRONMENT & PATENT RESOURCE LIBRARIAN
Why Search: Who needs patent information

- **Scenario 1:**
  “I work in Research and Development but I’m not ready to look at patents just yet – I’m still refining my ideas.”

  Should Adèle think about using patent information?

- **Scenario 2:**
  “I’m not really interested in patent information. I’ve got a good product and it’s ready for the market, so what do I need a patent for?”

  Should Chenglei consider conducting a patent search?
  
  ![Yes and No options]
Why Search: Who needs patent information

- Scenario 3:

  “I’ve finished developing my invention and I’m now going straight ahead to apply for patents around the world.”

  Should Samantha immediately go ahead with all her patent applications at this point in time?

  - Yes
  - No

- Scenario 4:

  “I’m taking over a company that has got an extensive portfolio of patents. I think it would probably be worthwhile to do a patent search.”

  Would you agree or disagree with Inez?

  - Agree
  - Disagree
### IV. DETAILS OF THE INVENTION

#### 16. Overview – Provide a summary or general description of the invention including its field of application:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit/Advantage</th>
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<tr>
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#### 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>
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</thead>
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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.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit/Advantage</th>
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#### 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.

<table>
<thead>
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<th>Feature</th>
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#### 20. Commercial Applications – List the critical commercial problems this invention solves:

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#### 21. Commercial Interest – Provide details of the commercial parties that may be interested in this technology:

<table>
<thead>
<tr>
<th>Company</th>
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</table>
Why Search: The benefits

- To avoid duplicating research and development efforts and come up with new ways of solving problems
- To investigate whether an invention is new and can be patented
- To steer clear of other patents and avoid expensive infringement actions in court
- To use in business planning such as decisions on licensing, technology partnerships, mergers and acquisitions.
- To monitor the research activities of competitors
- To help identify and analyze filing trends
## TYPES OF PATENT SEARCHES

<table>
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<td>Inventor Name</td>
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Google Patents: https://patents.google.com/
Questions

- How do I know if this patent is an application or granted patent?
- When is this patent granted? What is the date of grant?
- Where is this patent filed? Is this patent also filed in other countries?
- How can I find similar patents?
How to read a Patent Document

United States Patent
Hotelling et al.

Patent No.: US 9,250,734 B2

Proximity and Multi-Touch Sensor Detection and Demodulation

Applicant: Apple Inc., Cupertino, CA (US)
Inventors: Steven P. Hotelling, Los Gatos, CA (US); Christoph H. Kral, Cupertino, CA (US)
Assignee: Apple Inc., Cupertino, CA (US)

Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Appl. No.: 14/666,146
Filed: Mar. 23, 2015

Prior Publication Data

Related U.S. Application Data
Continuation of application No. 14/570,915, filed on Dec. 15, 2014, which is a continuation of application No. 11/649,998, filed on Jan. 3, 2007, now Pat. No. 8,970,501.

Int. Cl.
G06G 5/00 (2006.01)
G06F 3/041 (2006.01)

U.S. Cl.
CPC .......... G06F 3/041 (2013.01); G06F 3/321 (2013.01); G06F 3/322 (2013.01); G06F 3/017 (2013.01); G06F 3/027 (2013.01); G06F 3/042 (2013.01).

Field of Classification Search
CPC : G06F 3/03547; G06F 3/0412; G06F 3/0414; G06F 3/044; G06F 3/045; G06F 2203/04104; G06F 2230/04101

Abstract
The use of one or more proximity sensors in combination with one or more touch sensors in a multi-touch panel to detect the presence of a finger, body part or other object and control or trigger one or more functions in accordance with an “image” of touch provided by the sensor outputs is disclosed. In some embodiments, one or more infrared (IR) proximity sensors can be driven with a specific stimulation frequency and emit IR light from one or more areas, which can in some embodiments correspond to one or more multi-touch sensor “pixels” locations. The reflected IR signal, if any, can be demodulated using synchronous demodulation. In some embodiments, both physical interfaces (touch and proximity sensors) can be connected to analog channels in the same electrical core.

19 Claims, 10 Drawing Sheets
How to Read a Patent Document

1. PROXIMITY AND MULTI-TOUCH SENSOR DETECTION AND DEMODULATION

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Ser. No. 14/570,915, filed Dec. 15, 2014, which is a continuation of U.S. application Ser. No. 11/649,598, filed Jan. 3, 2007 (now U.S. Pat. No. 8,970,501, issued Mar. 3, 2015), the contents of which are incorporated by reference herein in their entirety for all purposes.

FIELD OF THE INVENTION

This relates to panels used as input devices for computing systems, and more particularly, to processing of multi-touch events (the simultaneous interaction of one or more objects upon a touch-sensitive surface) and hover events (the no-touch, close proximity hovering of fingers or other objects above a touch-sensitive surface but outside the field detection capabilities of touch sensors).

BACKGROUND OF THE INVENTION

Many types of input devices are presently available for performing operations in computing systems, such as buttons or keys, mice, trackballs, touch panels, joysticks, touch screens and the like. Touch screens, in particular, are becoming increasingly popular because of their ease and versatility of operation as well as their declining price. Touch screens can include a touch panel, which can be a clear panel with a touch-sensitive surface. The touch panel can be positioned in front of a display screen so that the touch-sensitive surface covers the viewable area of the display screen. Touch screens can allow a user to make selections and move a cursor by simply touching the display screen via finger or stylus. In general, the touch screen can recognize the touch and position the touch on the display screen, and the computing system can interpret the touch and thereafter perform an action based on the touch event.

US 9,250,734 B2

2. CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of U.S. application Ser. No. 14/570,915, filed Dec. 15, 2014, which is a continuation of U.S. application Ser. No. 11/649,598, filed Jan. 3, 2007 (now U.S. Pat. No. 8,970,501, issued Mar. 3, 2015), the contents of which are incorporated by reference herein in their entirety for all purposes.

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What is claimed is:

1. An apparatus for detecting touch events and hover events on or about a touch-sensitive surface, comprising:
   a plurality of touch sensors configured for detecting one or more touch events at the touch-sensitive surface; and
   one or more proximity sensors configured for detecting one or more hover events spaced from the touch-sensitive surface, each hover event comprising a hovering of a second object near the touch-sensitive surface; and
   a processor communicatively coupled to the plurality of touch sensors and the one or more proximity sensors, the processor capable of detecting movement of the second object based on a sequence of hover events detected by the one or more proximity sensors, and performing a function when a detected hover event at least partially overlaps in time with the detected movement.

2. The apparatus of claim 1, wherein the processor is further capable of:
   detecting the movement of the second object by tracking the sequence of hover events detected by the one or more proximity sensors over a period of time; and
   performing the function when the touch event is detected and the tracking of the sequence of hover events results in the detection of the movement.

3. The apparatus of claim 1, at least one of the proximity sensors comprising:
   a transmitter configured to emit radiation; and
   a receiver configured to receive reflected radiation emitted by the transmitter.

The concurrent use of a multi-touch panel along with one or more proximity sensors can provide additional detection and operational capabilities not available with a multi-touch panel by itself. For example, although only the actual touching of a finger, palm or other object upon a touch-sensitive
Patent Searching: Patsnap
PatSnap - Introduction

- **Patsnap** is a patent database subscribed by NUS Libraries
- Create an account with your NUS email in order to use all the functionalities of Patsnap i.e. save and set up search alerts
- Sign in as Guest to do searches without saving
- Able to search for patents using US classification, IPC, CPC and Locarno Classification
Access to PATSNAP

http://libportal.nus.edu.sg
Patsnap: Known Patent (US7537696)

Method And Apparatus For Treatment Of Wastewater Employing Membrane Bioreactor

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<tr>
<td>Standardized Inventor</td>
<td>ARNAUD JOHNNY</td>
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<td>IPC(8): B01D3/06 B01D3/16 B01D17/035 B01D17/038 B01D17/12 B01D21/21 B01D63/00 B01D65/00 B03D1/14 C02F C02F1/00 C02F1/38 C02F1/44 C02F3/34</td>
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</tbody>
</table>
Patsnap: Citation Analysis

- Patsnap also provide citation information for each individual patent document
- Cites – to find out what are the previous patent(s) & other references that this patent cited
- Cited By – to find out what are the other patent(s) had cited this patent
Patent Classification
Methods of searching:

- **Method 1 – Classification search**
  - If you have identified relevant IPC codes

- **Method 2 – Keywords**
  - If you have not identified relevant IPC codes
Why Search by Patent Classification?

- Useful to search by patent classification for
  - Old patents (e.g. pre-1976 patents in USPTO site)
  - Patents in foreign language
  - Different ways to describe concepts
  - Searching patents based on their technical areas (disadvantages of relying on keywords search alone)
- Classifications are updated regularly
International Patent Classification (IPC)

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<td>G</td>
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<td>H</td>
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“IT IS A HIERARCHICAL CLASSIFICATION SYSTEM USED PRIMARILY TO CLASSIFY AND SEARCH PATENT DOCUMENTS (PATENT APPLICATIONS, SPECIFICATIONS OF GRANTED PATENTS, UTILITY MODELS, ETC.) ACCORDING TO THE TECHNICAL FIELDS THEY PERTAIN. …”

(http://www.wipo.int/classifications/ipc/en/faq/index.html)
Patsnap: Recap

IPC : B01D63/06
Patsnap: IPC Codes

- Enter relevant IPC code under Classification Search section, e.g. B01D63/06

  Search Result

  B: PERFORMING OPERATIONS; TRANSPORTING >> B01: PHYSICAL OR CHEMICAL PROCESSES OR APPARATUS IN GENERAL

  **B01D**

  **SEPARATION** (separating solids from solids by wet methods B03B, B03D, by pneumatic jigs or tables B03B, by other dry methods B07; magnetic or electrostatic separation of solid materials from solid materials or fluids, separation by high-voltage electric fields B03C; centrifuges B04B; vortex apparatus B04C; presses per se for squeezing-out liquid from liquid-containing material B30B 9/02) [5]

  **B01D63/00**

  Apparatus in general for separation processes using semi-permeable membranes [5,2006.01]

- OR browse through the classification list which provides definition of each code

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<td></td>
<td>Hollow fibre modules [5,2006.01]</td>
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<td></td>
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<td></td>
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</table>
Patsnap: IPC Codes

- Click on “Analyze Patents” to find more information and analysis of the search results.

- The IPC codes that appeared in the search results will be ranked from to most to least no. of patents under Technical Classification section.
Keyword Helper:

<table>
<thead>
<tr>
<th>US Classification</th>
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<tbody>
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**Assignee Name**

**Inventor Name**

**IPC Helper - Search Class And Add**

- **water treatment**
  - C08J11/14: by treatment with steam or water [4.2006.01]
  - E03B3/00: Methods or installations for obtaining or collecting drinking water or tap water (treatment of water C02F) [1.4.2006.01]
  - C02F1/00: Treatment of water, waste water, or sewage (C02F 3/00-200F 5/00) (treatment of water)
Construct Search Statement
Information Search Process

- Identify Keywords
- Select Sources
- Construct Search Statement
- Satisfied with Results?
  - Yes: Access Full Text
  - No: Narrow/broaden
  - No: Advanced Search Techniques

Narrow/broaden
Advanced Search Techniques
Set Alerts
Access Full Text
Topic search - Brainstorming

- Start with the idea. Write down all the words you can think of that describe your invention. It is important to think broadly and creatively. Keep the following questions in mind:
  - What does the invention do?
  - What is the end result?
  - How does it work?
  - What is it made of?
  - What is it used for?
  - What problem(s) does it solve?
Patsnap : Topic Search

If you have not identified relevant IPC codes

- Keyword search, e.g. Industrial wastewater treatment

- Preview the relevant IPC codes listed in the “International Classification facet on the left column and click button

- Or use “Anaylze Patents” Function
### Patsnap: Combine Classification Codes with Keywords

Refine within 96 records

| AND | (International Classification: "C02F1/52" X) |

- **Refine**
- **Recent**
- **All Filters**

**Patent Type**
- Applications
- Patents
- Utilities

**Assignee Name**
- BATTELLE MEMORIAL INSTIT...
- AIR PRODUCTS & CHEMICAL...
- AIR PRODUCTS & CHEMICAL...
- DENIS, RUDI

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1-20 records, 96 records in total

Add to Workspace
# Search Statement

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<td>AND, OR, NOT ( ) &quot;solid residue&quot; AND (&quot;power plants&quot; OR incineration)</td>
<td>205,808</td>
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<td>&quot;&quot;industrial wastewater treatment&quot;</td>
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Search Statement

Original Search Statement
"solid residue" AND ("power plants" OR incineration)

Revised Search Statement
("solid residue" OR "solid waste") AND ("power plants" OR incineration)

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<th>Concept 1</th>
<th>Concept 2</th>
<th>Concept 3 (if any)</th>
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<td>solid waste</td>
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How to save the search statement:
Patsnap: Add to Workspace
Patent Searching: Lens
New concepts for natural gas fired power plants which simplify the recovery of carbon dioxide

O. Bolland, S. Sæther
### Results for `citing_orcid_works:("0000-0002-0861-2488")`

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<tr>
<td><strong>A Method And Device For Pattern Matching And Parsing On Abnf Character String</strong></td>
<td>EP 1868090 A1</td>
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<tr>
<td>Published: Dec 19, 2007 Family: 6 Cited: 0 Info: Applicant: Huawei Tech Co Ltd, Ustc Univ Science Tech Cn</td>
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<tr>
<td><strong>Controlling Quality Of Service In Communications Networks</strong></td>
<td>EP 1940105 A1</td>
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<td>Published: Jul 2, 2008 Family: 2 Cited: 7 Info: Applicant: France Telecom</td>
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Extra info: How to find journal articles that have cited a particular patent

- Search for the patent title in **Scopus** and select “References”
- Example: “Method for node ranking in a linked database” US6,285,999
- Search results will give a list of journal articles/conference papers that have cited this patent
Tips

- Explore and find out the relevant patent classification codes for your topic
- Find out the relevant citations
- Search The Lens for citations
- Use Patsnap to search for your invention or technology using keyword search
- Tip: Use Boolean Operators (AND, OR, NOT), brackets and “quotation marks” to improve your search statements
Additional Tips

- To get complete picture of your invention:
  - Search patents
  - Search journal articles, books, conference papers etc.
  - Search newspaper articles, etc.

- Search more than one databases/Internet sources
  - Different coverage for databases
  - Each database has its strengths and weaknesses

- Full text information may not be searchable for old patents

- Save search strategies or set up alerts

- Search with an end in mind
Summary

- Patent application process in NUS
- How to read a patent document and understand the different sections
- Patent Searching
- Patent citation information
- Patent Classification
- Keyword brainstorming
- Patent analysis
- Cited References
  - The Lens
  - Scopus reference field search
Guides & Links

- Industry Liaison Office. Information for researchers
  (http://enterprise.nus.edu.sg/technology-commercialisation/for-researchers)

  (http://libguides.nus.edu.sg/patents)
Feedback Form
Questions & Answers

Please complete the online feedback form at

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FAQ (ILO)
Thank you.
Have a nice day!