Shaping Business Strategy Through Competitive Intelligence – Strategic Use of Intellectual Property Information

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Patent Information General
How does the patent system work?

- **Protection:** A patent allows the patent holder to exclude others from commercially exploiting the invention covered by the patent in a certain country or region and for a specific period of time, generally not exceeding 20 years.

- **Disclosure:** A patent gives the public access to information regarding new technologies in order to stimulate innovation and contribute to economic growth.

- Since the protection offered by a patent is territorial, covering only the jurisdiction in which the patent has been granted, the information contained in a patent document is global, available as a disclosure to any individual or organization worldwide, thus allowing anyone to learn from and build on this knowledge.
Why use patent information?

- Patent information is an important resource for researchers and inventors, entrepreneurs and commercial enterprises, and patent professionals.

- Patent information can assist users to:
  - Avoid duplicating research and development effort
  - Determine the patentability of their inventions
  - Avoid infringing other inventors’ patents
  - Estimate the value of their or other inventors’ patents
  - Exploit technology from patent applications that have never been granted, are not valid, or from patents that are no longer in force
  - Gain Intelligence on the innovative activities and future direction of business competitors
  - Improve planning for business decisions such as licensing, technology partnerships, and mergers and acquisitions
What information does a patent document contain 1

- Patent information comprises all information which either been published in a patent document or can be derived from analyzing patent filing statistics and includes:

- Technology information from the description and drawings of the invention

- Legal information from the patent claims defining the scope of the patent and from its legal status

- Business related information from reference date identifying the inventor, date of filing, country of origin, etc.

- Public policy-related information from an analysis of filing trends to be used by policymakers, e.g., in national industrial policy strategy
What information does a patent document contain?

Patent information comprises all information which either been published in a patent document or can be derived from analyzing patent filing statistics and includes:

- Applicant
- Inventor
- Description
- Claims
- Priority filing, Priority date
- Filing date
- Designated states
- Legal status
- Citations and references
- Bibliographic data
Where can patent information be found

- Many national and regional patent offices provide free online access to their own patent collections as well as to selected patent documents from other offices. An extensive list of national patent databases can be found at: www.wipo.int/patentscope/dbsearch/national_databases.html

- WIPO offers free online access to all international patent applications within the framework of the PCT and their related documents and patent collections from National and Regional Offices through its PATENTSCOPE search service: http://patentscope.wipo.int/search

- A number of commercial and non-profit providers also offer free patent information databases online. Certain commercial providers have established value-added services for access on a fee-paying basis including translations of patent information and additional systematic classification
How can patent information be used

- Prior art searches
- Gathering business intelligence
- Avoiding patent infringement
- Patent valuation
- Identifying key trend in technology development
Search Strategy
Which strategies can be used to search patent information

- Among the search criteria that can be used to find relevant patents are:
  - Keywords
  - Patent classification
  - Dates (e.g., priority date, application date, publication date, grant date)
  - Patent reference or identification numbers (application number, publication number, patent number)
  - Names of applicants/assignees or inventors

- Most search services permit users to search bibliographic/front page data, that is all data contained in a patent application except the description and claims.

- Some search services, including the WIPO PATENTSCOPE search service, allow full-text searches, including the description and claims.
To target searches effectively, the following tools can be used:

**Word operators:** “AND”, “ANDNOT” (“NOT”), “OR”, “XOR”, “NEAR”

- tennis AND ball : having both the word
- tennis ANDNOT ball : having the word “tennis” but not “ball”
- tennis OR ball : having either the word or both
- tennis XOR ball : having either the word but not both
- tennis NEAR ball : having both the words within a certain number of words of each other

**Truncation:** words can be truncated, i.e., shortened to their primary root or stem, by reducing its length using an operator called a wildcat, usually an asterisk (*), so as to increase the coverage of the search, for instance: elect*, all words based on the word stem “elect”, e.g., electricity, electrical, electron
Nesting: Nesting refers to the use of parentheses to organize search queries in order to resolve potentially confusing search syntax, for example:

- tennis AND ball OR racket : two potential search outcomes to be resolved (the default order in which different operators are applied in the absence of parentheses may vary between search services)
- (tennis AND ball) OR racket : having either the words “tennis” and “ball” or the word “racket”
- tennis AND (ball OR racket) : having the word “tennis” and either the word “ball” or “racket”

Phrases: If you surround a group of words with quotation mark (“), everything surrounded by those quotation marks will be treated as a single search term. This allows you to search for a multi-word phrase rather than specifying each word as a separate term, for instance: “tennis ball”, having the phrases “tennis ball”
All patent documents are individually classified using a standardized system identifying the technology group or groups to which the innovation described in the document belong.

A widely used system is the International Patent Classification (IPC) System (www.wipo.int/classifications/ipc).

In its latest edition, it subdivides technology into almost 70,000 fields or groups. Each group describes a specific technology and is identified by a “classification symbol” consisting of a sequence of numbers and letters.

The IPC system is organized according to hierarchical levels. From highest to lowest; these levels are: sections, classes, subclasses, and groups (main groups and subgroups).
Search by patent classification 2

Each section has a title and specific letter code, as follows:

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

From section to subgroup, the code “C21B 7/10” can, for instance, be broken down as follows:

- Section C: Chemistry; Metallurgy
- Class C21: Metallurgy of iron
- Subclass C21B: Manufacture of iron or steel
- Main group C21B 7/00: Blast furnace
- Subgroup C21B 7/10: Cooling; Devices therefor
Search in specific data fields 1

- It is often desirable to search for words, numbers, or combinations thereof in a particular data field.
Search in specific data fields 2

In the advanced search of the WIPO PATENTSCOPE search service, the filed code “DE” is associated with the “Description” field.
Using citations and reference information 1

- Patent applications often contain references to earlier patent documents, particularly in the description section of the application.

- Citations contained in search reports can be a useful way of identifying additional documents related to the technology being investigated or help uncover further search criteria.

- **Category X:** Document that, taken alone, anticipates the claimed invention, as a result of which the claimed invention cannot be considered novel or cannot be considered to involve an inventive step.

- **Category Y:** Document that, in combination with one or more other such documents, anticipate the claimed invention, insofar as such combination can be considered obvious to a person skilled in the art.

- **Category A:** Document providing technical background information on the claimed invention.
Using citations and reference information 2
Good practices in searching patent documentation 1

- The most effective searches exploit all the search options, by using and combining keywords, IPC, and number/date ranges.

- Effective searching of patent documentation is a step-by-step process, moving from an initial broad search to increasingly more focused searches.

- Ultimately, however, the number of search results must be limited to a reasonable number to allow the individual records to examined in detail.
Good practices in searching patent documentation 2

- **Broad vs. specific search terms**: the keywords and IPC used in the first rounds of searching should cover the broad field of technology to which the innovation in question belongs.
  - searching information on light-emitting diodes
  - initially search using keywords: “semiconductor” or IPC such as the subclass: H01L (semiconductor devices)
  - rather than the group H01L33/00 (semiconductor devices specially adapted for light emission)

- **Inclusive/exclusive search operators**: certain search operators can be used to broaden your search (inclusive operators), while others serve to narrow your search (exclusive operators)
  - Inclusive operators: “OR”
  - Exclusive operators: “AND”
Usage of Patent Information
How can patent information be used

- Prior art searches
- Gathering business intelligence
- Avoiding patent infringement
- Patent valuation
- Identifying key trend in technology development
Prior art searches

- Novelty: Is an invention new?
- Non-obviousness/Existence of an inventive step: Is the invention sufficiently different from existing technologies?
- Searching patent documents is an important step in determining whether an invention is ultimately patentable.
- Determine the characteristics of the invention: derive essential words and phrases that will be used in search
  - What problem does your invention solve?
  - What does your invention do?
  - What effect does your invention produce?
  - How is your invention construed?
  - What materials or methods are used in the construction of your invention?
Practical case

- You have developed a method for printing solar cells onto aluminum foil at low temperatures using a nanoparticle “ink”

Step 1: Identify central concepts related to your innovation
- “solar cell”(product), “aluminum foil”, “nanoparticle ink”(materials used in the production process)

Step 2: Determine keywords for your search
- the next step is to find synonyms and related keywords and phrases for the concepts identified in the first step:
  - solar cell: photovoltaic cell (synonym)
  - aluminum foil: aluminium foil (alternative spelling), metal foil (related term)
  - nanoparticle: nanoparticle solution (related term), nanoparticle suspension (related term)
Practical case

- Step 3: locate the pertinent IPC symbols through IPC publication, search terms (http://web2.wipo.int/ipcpub)
- Term “solar cell”, identifies H01L 31/00 as a relevant IPC symbol
Practical case

- **Step 4: Perform first search (WIPO PATENTSCOPE advance search)**
  - Should be relatively broad, using “OR” Boolean operator, using a wildcat operator to include plural forms, and “International Class”
  - “solar cell*” OR “photovoltaic cell*” OR IC/ H01L-31*
  - This search produces over 103,000 results
Practical case

Step 5: Sharpen search

- the search should be limited using more specific terms and linked using the “AND” Boolean operator
- in order to capture results containing wording such as “nanoparticle solution” as well as “solution containing nanoparticles”, define the distance between 2 words
- (“nanoparticle suspension”~5 OR “nanoparticle solution”~5 OR “nanoparticle ink”~5) AND (IC/“H01L31” OR “solar cell”~5 OR “photovoltaic cell”~5) AND (“aluminum foil” OR “metal foil”)
- This search produces much smaller results
- Among the results are several international applications by Eastman Kodak Company, Hewlett-Packard Development Company L.P.
- “Method of forming a transistor having a dual layer dielectric” etc.
Gathering business intelligence

- Knowing which companies or individuals are technology leaders in your area of business
  - can play important role in planning your commercial and research and development activities

- Patenting activity and patent ownership
  - can be important in identifying principal innovators in different area of technology
Practical case

Your company produces farm equipment and would like to keep track of new developments in plough technology on the international market.

Step 1: Determine criteria for your search

- use IPC symbols to find relevant applications
- searching the IPC according to “plough” (http://web2.wipo.int/ipcpub) reveals several technology...
Practical case

- Step 2: Include all relevant groups by using “OR” Boolean operator
- WIPO PATENTSCOPE advance search: “International Class: field code (“IC”)”
- IC/ A01B 3 OR IC/ A01B 5 OR IC/ A01B 7 OR IC/ A01B 9 OR IC/ A01B 11 OR IC/ A01B 13 OR IC/ A01B 15 OR IC/ A01B 17
- This search retrieves around 2140 results
Practical case

- Step 3: Analyze the data
- Navigate to in-depth analysis and visualize the patent activity in tabular or graphical format
Practical case

- Step 4: Keep track of current information
- By subscribing to the RSS feed, you can remain up-to-date on the latest international applications relevant to your business.

TILLER HOUSING
2013년 3월 1일 금요일, 오전 1:00:00
A tiller (10) includes a tiller frame (12) and an upright assembly (24) extending from the frame. The frame is supported by at least one wheel (14) and defines a cavity (26). A transmission assembly (390) is supported by the frame and has an output member that is configured to be drivenly coupled to a first power source in a first battery-powered configuration and to a second power source in a second electric-powered configuration. A tilling implement (22) includes a drive shaft (48) that is driven by the output member. The tilling implement comprises at least one tine plate (50). The cavity (26) is configured to removably receive a battery (30) in the first battery-powered configuration and removably receive a ballast (356) in the second electric-powered configuration.

TURF TREATMENT
2013년 3월 1일 금요일, 오전 1:00:00
A method for the treatment of turf (11) comprising grass (12) growing in a matrix (15, 16) comprising removing matrix (15, 16) including any thatch and other infestation by blading (18) moving through the matrix (15, 16) to a predetermined depth (d). The method may be used to treat turf (11) reinforced with artificial grass (13). Equipment for carrying out the treatment comprises a bladed rotor (17) rotating about a horizontal axis.

AGRICULTURAL TRACTOR LINKAGE CONTROL SYSTEM
Avoiding patent infringement

- Having identified relevant patent documents, the first step is to examine the legal status of the patent application:
  - Has the patent been granted, rejected, withdrawn, or is it still pending?
  - In which countries?
  - Is the patent still valid, or has it expired?

- If a patent is in force in a particular jurisdiction in which you wish to market your product, the second step is to appraise the claims made under this patent

- Potential infringements can be avoided by modifying your product to take into account these claims
Patent valuation

- Patent documentation can provide an indication as to the value of patents that you or your competitors have been granted.

- The citation information contained in patent documents subsequent to a particular patent can be useful for estimating the value of the patent in question.

- The number of times a patent is cited in later patent documents is indicative of its technical relevance and thus of its value.
Identify key trends in technology development

- Statistical data obtained from patent documents can be used to map key trends across different fields of technology and different countries.

- Depending on the criteria according to which patent data can be broken down:
  - it can be used to track the growth and changes in patent activity over time;
  - examine the distribution of patent application in a country by residents compared to non-residents;
  - identify the technology areas in which a country is predominantly active in terms of patenting activity.
Practical case

- Your government has identified the absence of adequate food preservation technology as a key obstacle to further development of agricultural export sector and is considering negotiating technology transfer agreement with other countries.

- Step 1: Determine Criteria for your search
  - Field of technology: A23L 3/00 (“food preservation”)
**Practical case**

- **Step 2:** perform search and **Step 3:** Analyze the data

- WIPO PATENTSCOPE advanced search (IC/A23L 3)
Practical case

- Step 3: Analyze the data
  - Visualization of search results by countries, by publication date
Patent Examination Sample
The invention

A **heating element** for a washing machine which is cheap and compact and helps to reduce water consumption.

The heating element is a foil heating element at the bottom of the tub of a washing machine.
The invention

A **heating element** for a washing machine which is cheap and compact and helps to reduce water consumption.

How can you protect it from imitation?

- "cheap", "helps to reduce ..."
  → too vague and subjective

- "compact"
  = technical function → patent
How to patent this invention: claim it!

Patent Claim: "A heating element for a washing machine which is compact ..."

No, this is stating the technical problem. Problems cannot be patented – only specific solutions.

What are the technical features that solve the problem and make the heating element compact?

Patent Claim: "A washing machine with a heating element for heating water inside the tub of the washing machine wherein the heating element is arranged in and adapted in its shape to the bottom of the tub."

You don’t want anyone circumventing the patent by heating something other than water or by arranging the heating element at a different point not exactly at the bottom of the tub.
How to patent this invention: claim it!

Patent claim: "A washing machine with a heating element for heating a medium inside the tub of the washing machine, wherein the heating element is arranged in and adapted in its shape to the tub."

A prior art search will show whether the invention – as claimed – is actually new.
Result of the prior art search

The prior art search found a document that shows a similar heating element for a washing machine.

"... curved plate of electrically insulating material with electrically conductive material applied to at least one surface thereof ..."
Comparison of the two inventions

The invention as claimed

"A washing machine with a heating element for heating a medium inside the tub of the washing machine wherein the heating element is arranged in and adapted in its shape to the tub."

"… a foil heating element … which is fitted to and adapted in its shape to the tub …"

EP 0 352 499 A2

"The heating device ... is mounted in correspondence with the bottom wall ... of the vessel, and expediently spaced therefrom."

- New ("foil heating element" and "fitted to the tub" are not disclosed in EP...)
- Inventive step (technical effect: lower water level in the tub is possible)
Claim to protect the invention

Claim to be filed:

"A washing machine with a foil heating element for heating a medium inside the tub of the washing machine, wherein the heating element is fitted to and adapted in its shape to the tub."
Use of dependent claims to improve protection

An independent (broader) claim helps prevent the patent from being circumvented.

Dependent (more specific) claims are tailored to fit exactly to potential infringing products.
Application filed with the EPO

Claim 1:
A washing machine with a **foil heating element** for heating a medium inside the tub of the washing machine, wherein the heating element is **fitted to** and adapted in its shape to the tub.

Claim 2: The washing machine of claim 1, characterised in that the foil heating element is glued to the inside of the tub.

Claim 3: The washing machine of claim 1, characterised in that the foil heating element is an integral constituent of the tub and has been formed in the tub during injection moulding thereof.

The EPO will perform its own prior art search and then consider whether the invention AS CLAIMED is new and non-obvious.
Additional prior art found by the EPO

"Heating device for a household appliance"

DE 100 25 539 A1:
"Heating device ... comprising a foil heating element (1) ... adapted and attached to a tub (7) of a washing machine ..."
The opinion of the EPO

**Applicant's claim:**

"A washing machine with a **foil heating element** for heating a medium inside the tub of the washing machine, wherein the **heating element is fitted to and adapted in its shape to the tub.**"

This is already shown in DE 100 25 539 A1

**EPO response:**

Please amend your claims if you want your invention protected!
Further analysis

Did the EPO overlook any important features of the invention?

Applicant's reply:
 Amendments to the application, explanation of the relationship between the invention and the prior art

**How can the claims be amended** to reflect the invention in such a way that it is new (considering all the prior art)?
## Comparison of the invention with the prior art

<table>
<thead>
<tr>
<th>Technical features of the invention</th>
<th>EP 0 352 499 A2</th>
<th>DE 100 25 539 A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adapted in its shape to the tub</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Foil heating element</td>
<td>No</td>
<td>✓</td>
</tr>
<tr>
<td>Glued to outside of tub</td>
<td>No</td>
<td>✓</td>
</tr>
<tr>
<td>During injection moulding</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### Advantages/technical result
- Compact + excellent heat transfer + easy assembly with fewer parts
  - No
  - No
Result of the analysis

It is known in the prior art to fit and adapt a foil heating element to the bottom of the tub of a washing machine.

However, the present invention suggests that the foil heating element can be formed in the tub during the injection moulding of the tub.

This particular way of fitting the foil heating element to the tub is not known and produces new, unique benefits.

There is no hint in the prior art to take a foil heating element and to form it in a tub during injection moulding of the tub. → The inventive step requirement is fulfilled!

The claim must be changed to distinguish it from DE 100 25 539 A1.
New claim

"A washing machine with a foil heating element for heating a medium inside the tub of the washing machine, wherein the heating element is fitted to and adapted in its shape to the tub, characterised in that the foil heating element is an integral constituent of the tub and has been formed in the tub during injection moulding thereof."
The object of the invention is to provide an electrical heating device for a domestic appliance ... cheap ... easy to assemble ... requires less space ... offers the possibility of reducing energy and water consumption.

... the foil heating element allows a very compact arrangement ... at the same time ... an optimal heat transfer ...

... the foil heating element is integrated during the production of the tub, for instance during the injection moulding ... requires only a few production steps; it does not require complex tools, either ...

Claim 3: The washing machine of claim 1, characterised in that the foil heating element is an integral constituent of the tub and has been formed in the tub during injection moulding thereof.
The patent is finally granted

Response from EPO: granted!

<table>
<thead>
<tr>
<th>Patent Number: EP 1 342 827 B1</th>
</tr>
</thead>
</table>

**EUROPÄISCHE PATENTERSCHRIFF**

**Veröffentlichungstag und Bekanntmachung des**

- **Hinweises auf die Patenterteilung:** 09.04.2008  Patentblatt 2008/15

- **Anmeldenummer:** 03005120.5

- **Anmeldetag:** 07.03.2003

**Elektrisch beheizbares Haushaltgerät**

- Electrically hestable household appliance
- Appareil ménager chauffé électriquement

**Benannte Vertragsparteien:**

- AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

**Priorität:** 07.03.2002 DE 10299575

- **Veröffentlichungstag der Anmeldung:** 10.09.2003 Patentblatt 2003/37

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**Entgegenahltungen:**

- DE-A- 10 025 539
- DE-A- 19 925 987
- US-A- 5 444 228
- DE-U- 1 823 414

**WIPO**

**WORLD INTELLECTUAL PROPERTY ORGANIZATION**
Thank You for Your Attention!

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