Learning path for patent examiners

Designing search strategies:
Intermediate level

Version: July 2022
Introduction

This publication, "Designing search strategies, Intermediate level", is part of the "Learning path for patent examiners" series edited and published by the European Patent Academy. The series is intended for patent examiners at national patent offices who are taking part in training organised by the European Patent Office (EPO). It is also freely available to the public for independent learning.

Topics covered include novelty, inventive step, clarity, unity of invention, sufficiency of disclosure, amendments and search. Also addressed are patenting issues specific to certain technical fields:

- patentability exceptions and exclusions in biotechnology
- assessment of novelty, inventive step, clarity, sufficiency of disclosure and unity of invention for chemical inventions
- the patentability of computer-implemented inventions, business methods, game rules, mathematics and its applications, presentations of information, graphical user interfaces and programs for computers
- claim formulation for computer-implemented inventions

Each publication focuses on one topic at entry, intermediate or advanced level. The explanations and examples are based on the European Patent Convention, the Guidelines for Examination in the EPO and selected decisions of the EPO's boards of appeal. References are made to the Patent Cooperation Treaty and its Regulations whenever appropriate.

The series will be revised annually to ensure it remains up to date.

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All references to natural persons are to be understood as applying to all genders.
1. **Learning objectives**

Participants to this course will learn:
- How to harvest information from the Internet, non-patent and patent literature
- How to select a relevant subset from a broad collection of results
- How to search starting from a specific combination of features
- How to use the problem/solution approach in search

2. **Where to search – the internet**

The advantages of searching the internet are that a huge amount of information is available free of charge and the search is very rapid, yielding almost instantaneous results. In addition, some search engines and commercial providers offer advanced search options (for example Google Scholar).

The drawbacks of internet searches are that the information retrieved may be unreliable (for example due to a lack of peer review). Furthermore, it may be difficult to determine the publication date of any relevant prior art retrieved, along with issues concerning the lack of confidentiality of searches, which makes the internet unsuitable for searching unpublished inventions. Lastly, internet searches are prone to generating many irrelevant hits.

When searching external document collections for material in relation to unpublished subject-matter using non-encrypted connections (e.g. Google Patents or the internet in general), search examiners should be careful when formulating search strategies not to reveal confidential material (i.e. the subject-matter of the unpublished patent application; see Guidelines (GL) B-III, 2.4).

In general, internet searches seem to be best suited to quickly evolving fields of technology which require keyword-based searches, to the domain of traditional knowledge (for example folk medical treatments) and to products having a large commercial impact (for example ink-jet printing on coffee or beer).

**Examples**

See the citations of EP17927427.

**Examples**

See the patent US2008127786.

**Legal references:**
GL B-II, 3; GL B-IX, 2; GL B-IX, 3; GL B-IX, 4

3. **Where to search – non-patent literature (NPL), patent literature and specialised databases**

**NPL**

NPL offers the following advantages as an information source:
- There is little "noise" since NPL is limited to technical/scientific publications in specific fields.
- There is the possibility to search in abstracts and sometimes in full texts and citations.
NPL searches offer a uniform way of accessing papers from a variety of publishers. Advanced search tools are available, for example for drawing chemical formulae or entering sequence listings. Information retrieved from NPL is reliable due to peer review.

Disadvantages of searching NPL include:
- The coverage is limited because not all relevant journals or conferences may be indexed.
- Access to NPL is restricted because it is usually subscription-based and sometimes expensive.
- Papers on theoretical concepts or discoveries are often irrelevant because this subject-matter is not patentable under Article 52(2)(a) EPC.
- The search interfaces vary widely in the field of NPL and there is a lack of standardisation.

Search in NPL is well suited to keyword-based searches and is worthwhile in technical fields in which a large share of research activity originates in academia (for example life sciences, medical devices and computer science). Furthermore, NPL searches may be important for searches requiring specific search tools (for example biotech or organic chemistry).

It is possible to search the many periodicals (including abstract journals) to which the EPO subscribes. Furthermore, records of conference proceedings, reports, books, standards, etc. covering the three official languages of the EPO and the various technically important geographical areas are also available for search in the NPL database.

The systematically accessible NPL search documentation includes the relevant articles from the list of periodicals belonging to the minimum documentation under the Patent Cooperation Treaty (PCT), as established by the competent World Intellectual Property Organization (WIPO) body, and from other periodicals when deemed useful by the search division. In principle, copies of the articles selected as relevant for search purposes are added to the EPO search databases with a fictitious country code "XP", scanned for inclusion in the electronic "BNS" collection and included in the manual search files, where appropriate.

In addition to the NPL being useful for search purposes (see GL B-IX, 3), the NPL arranged for library-type access also includes literature that can be used primarily as sources of information and education for the search division, as regards general and background technical information and also new technical developments.

Furthermore, the collection includes many reports, pamphlets, etc. Internet-based document delivery services of publishing companies are made available to the members of the search division in the form of an Electronic Virtual Library (EVL), which examiners can access from their computer.

Examples

Explore the following search tools:
- Mesh database
- PubChem database
- Entrez

You can also make use of the Wayback machine to look at the history of a website.
Patent literature

The advantages of patent databases as an information source are as follows:

- The information regarding publication, filing and priority dates for patent documents is reliable.
- Patent databases (such as WPIAP and EPODOC) are well suited to structured search with classification symbols.
- The coverage in patent databases is comprehensive with few gaps.
- Patent documentation is freely accessible from various national and international patent offices (for example the Espacenet search tool provided by the EPO).

One disadvantage is that different patent offices require knowledge of different languages and classification systems (e.g. a knowledge of German is required to search in the databases of the German Patent and Trade Mark Office (DPMA)). However, searching in patent databases is essential when the search relies on classification symbols. Patent search is important in technical fields in which research is performed by companies.

Examples

Explore the following search tools:

- Espacenet
- Google Patents

Legal references:
GL B-II, 3; GL B-IX, 2; GL B-IX, 3; GL B-IX, 4

4. Search using classification: Espacenet example

Let us look at a search for "transfer" combined with B41M5/382/C/IC (i.e. searching for the keyword "transfer" combined with the classification symbol B41M5/382 in the Cooperative Patent Classification (CPC) and International Patent Classification (IPC) classification schemes):
Examples

Open Espacenet and search for "clippers for chocolate".

Clippers for chocolate -- search results

5. **Broadening the search to perform a "complete search"**

As we have seen previously at Entry level, if their preliminary search does not anticipate the claim(s) – though this is not usually the case – search examiners will go on to perform a complete search by broadening the scope of their search. This will involve one or more of the following:

- Building on the search table defining the scope of the search by adding synonyms, different spellings, plurals, etc.
- Combining the keywords with classification symbols using Boolean operators.
- Incrementally adding further keywords to rationalise and reduce excessively large result sets.
- Updating the search table iteratively if further search terms and/or search concepts appear relevant.
- Searching an example from the embodiments.
- Retrieving search reports or cited/citing documents when relevant documents are found.

The search division starts the search process by formulating a search strategy, i.e. a plan consisting of a series of search statements expressing the subject of the search and resulting in sections of the documentation to be consulted for the search. In its initial phase, a search strategy will contain one or more combinations of the basic components mentioned in GL B-III, 2.2. The search process is iterative in the sense that the search division reformulates its initial search statement(s) according to the relevance of the documents retrieved (see GL B-III, 1.1 and B-IV, 2.4 and 2.6).

When using classification groups, the search division selects the groups to be consulted for the search, in both directly relevant fields and related fields. When appropriate, the search division will also consult other classification or indexing schemes (for example the Japan Patent Office’s FI and F-term schemes). Consulting colleagues in a similar technical field or in fields related to the content of the application is also an option (see GL B-I, 2.1). When in doubt about the appropriate fields in which to conduct the search, the search division may request advice from appropriate classification experts.

Usually various search strategies are possible, and the search division exercises its judgement, on the basis of its experience and knowledge of the available search tools, to select the search strategy most appropriate to the case in hand. The search division gives precedence to search strategies consulting sections of the documentation in which the probability of finding relevant documents is highest. Usually, the main technical field of the application will take precedence (see GL B-III, 2.2).

When considering whether to extend the search to other less relevant sections of the documentation, the search division will take account of the search results already obtained.

**Legal references:**
GL B-IV, 2.2; GL B-III, 2.2
6. Searching with classes: Espacenet example

Let us revisit the previous search for "transfer", this time combined with B41M5/382/C/IC and limited to "laser transfer printing":

7. Example of a complete search in Espacenet

Study the following example of a complete search, resulting in the retrieval of two documents which anticipate the first claim:

Feature table for claim 1

Claim 1:

"A method of lifting an object fully or partially submerged in a fluid, comprising the step of introducing buoyant bodies through an opening on the surface of the object into the interior of said object."

<table>
<thead>
<tr>
<th>Feature</th>
<th>Feature explanation (claim 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Lifting</td>
</tr>
<tr>
<td>F2</td>
<td>A submerged object</td>
</tr>
<tr>
<td>F3</td>
<td>By buoyant bodies</td>
</tr>
<tr>
<td>F4</td>
<td>Introduced into the object’s interior</td>
</tr>
</tbody>
</table>
### Terminology from thesaurus or synonyms dictionary

<table>
<thead>
<tr>
<th>Classification</th>
<th>Search concept 1</th>
<th>Search concept 2</th>
<th>Search concept 3</th>
<th>Search concept 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>/C /IC /FT</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Lifting</th>
<th>Submerged body</th>
<th>Buoyant bodies</th>
<th>Into interior</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Raising</td>
<td>(yacht)</td>
<td>(Ping-pong) balls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pushing up</td>
<td>Sunken (boat or</td>
<td>Floating (aid)</td>
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<td></td>
<td>Refloating</td>
<td>ship)</td>
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<td>Wreck</td>
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**How to search with a search table**

AND

OR
UNITIM STATES. PATENT OFFICE.

E. NOS. B. PETRIE, OF BUFFALO, NEW YORK, ASSIGNOE OF ONE-11ALF TAO
GEORGE311.1BLANCHARD, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR Raising SUNken VESSELS.

SPECIFICATION forming part of Letters Patent No. 526, 163i dated September 18, 1894, Application filed March 27, 1894. Serial No. 506,233. (Nomodel.) To all whom it may concern:

Be it known that 1, EipoB. PETRIE, a Citizen of the United States residing at Buffalo, in the county of Erie and State Of New York, have invented a new and useful Improvement in Apparatus for Raising Sunken Vessels, of which the following is a specification.

This invention Teiates to an apparatus, for raising sunken vessels and is designed more 4 r) especially for recovering vessels which are sunken to a depth -that, it is im practicable for divers to operate.

The object of my invention is the provision thereof, an apparatus 4 whereitby 30-lifting-cables! (5 may be
Examples

In Espacenet, search for a "nut holding device".

Nut holding device – search results

For example, a relevant result is US2669894A.

8. Broadening the search using the problem-solution approach

An alternative or additional way to improve the search table, broaden the search and improve its completeness uses the problem-solution approach (also used to rationalise inventive step). To use the problem-solution approach, search examiners should consider doing the following:

- Consider the technical problem that the invention seeks to solve.
- Determine which technical features solve the above-mentioned problem.
- Consider alternative solutions to the technical problem and describe these solutions using keywords.
- Add synonyms, alternative spellings and plurals to the search statements.
- Formulate search queries which describe the problem or the solutions.

As per Rule 42(1)(c) EPC, the description must mention the technical problem the application intends to solve (see also GL F-II, 4.5). This allows the technical problem addressed by the invention to be recognised even though it might not be immediately apparent from the claims.

Legal references:
GL B-III, 3.2.2; GL G-VII, 5.3

9. Beyond the course

You can deepen what you have learned during this course with the following further readings:
- WIPO, PCT International Search and Preliminary Examination Guidelines