Search Matters 2016
Searching functional features: tools and tactics
Speaker

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- Patent Examiner in the field of Electric Power Distribution
- EQE qualification

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Outline

1. **Functional features: definitions and challenges**

2. Proposed approach: Query Developer

3. Examples

4. Summary and conclusions
Definitions

- **Structural Feature**: Physical entity defined by constructive limitations
  Examples: *a rod, a screw, an RC-circuit*

- **Functional Feature**: still a physical entity, however defined by the operating function or the achieved effects.
  - (function)-er: a container, a comparator;
  - (function)-ing means fastening means, detecting means;
  - means for... means for measuring;
  - adapted to, configured to unit configured to compare A with B;
  - such that...
  - ..in use..
Two types of functional features

a) Defined by the **function**
   - fastening means = {glue, rivets, clips, screws, weld...}
   - a comparator = {transistor, Op-amp, micro-processor...}
   - a solvent
   - a communicating device {laptop, smartphone, transceiver,..}

b) Defined by the **effect**
   - Pin A is connected to the wheel B **such that** the reverse rotation is impeded.
   - The component is present in amounts and proportions just **sufficient to** arrest bleeding (T893/90).
Why functional features in the claim?

- Fair protection of equivalents, preventing obvious circumventions – e.g. just by replacing "nail" with "screw".
- Conciseness, compared to the enumeration of all alternatives.

EPO Guidelines F-III 1. (third paragraph)

"In some technical fields (e.g. computers), a clear description of the function may be much more appropriate than an over-detailed description of the structure"
Functional features: properties

- The functional feature is a generalisation.

- The scope is broader than the set of known alternatives. 
  *includes equivalents, future / unknown embodiments, combinations thereof, an "indefinite and abstract host of possible alternatives".*
Functional features: challenges

- How to identify a functional feature?

- What is to be searched?
  – the function or the structure?
  – the desired effects or the embodiments?

- How to build appropriate queries?
Functional features: challenges

- How to identify a functional feature?
  -> It has different possible implementations

- What is to be searched?
  – the function or the structure?
  – the desired effects or the embodiments?
  -> Both, in an organized manner

- How to build appropriate queries?
  -> “Query developer” approach
Outline

1. Functional features: definitions and challenges

2. **Proposed approach: Query Developer**

3. Examples

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Query developer for functions - I

Comprehensive searches are based on three main components: Classes, Words, References

How to find expressions representing a certain function?

Suggestion: Query developer with the “prism”
Query developer for functions - II

**Three-layer** developer: Embodiments, Equivalents, Effects

![Diagram showing three layers: Specific Embodiments, Inter-related Synonyms, Equivalents, with Effects at the top.]

**Available sources**
- Application itself
- Relevant prior art
- Searcher's knowledge
- Technical literature

**Available tools**
- Thesaurus
- Dictionaries
- Translation cycles
- Title statistics
- Query Builder Assistant
Query developer for functions - III

"Devices A and B mutually communicating"

Main search term: Communicat*

e.g. remote command, synchronisation, real-time update

Transmit / Receive / Exchange / Send [of]

Data / Information / Messages / Packet / Command

LAN, WLAN, Modbus, Wireless, Radio, Bluetooth, Ethernet, Intranet, Internet.
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Example 1: WO 2010/025091

“A motor protection relay with integrated communications, comprising:
- a memory;
- a processor [..]
- a communication server in operative communication with the processor and configured to perform communication operations [..]”

Search strategy: two concepts
1) Motor protection relays = class H02H7/08/low
2) Communication = Query developer
# Query Developer (Table format)

<table>
<thead>
<tr>
<th>Concept 1</th>
<th>Concept 2</th>
<th>Query</th>
<th>Hits</th>
<th>Relevant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor protection</td>
<td>A-B communication</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H02H7/08/low</strong></td>
<td><strong>Main term</strong></td>
<td>Communicat*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Effects</strong></td>
<td><strong>Remote</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Equivalents</strong></td>
<td><em><em>Receiv</em> prox/distance&lt;3 (data, info, messag, command)</em>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em><em>Transmit</em> prox/distance&lt;3 (data, info, messag, command)</em>*</td>
<td></td>
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<tr>
<td><strong>Embodiments</strong></td>
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<td>JPS637003 EP1579952</td>
</tr>
</tbody>
</table>
Example 2 - Smart Grids

Intelligent networks for distributing electricity - “Internet of Energy” - Interaction between the user’s meter and the utility company.

Real-time communication of data:

- Upstream: status, current consumption, actual & planned power.

- Downstream: power availability, tariff, requests of curtailment.
Example 2: WO 2012/81750

An electric apparatus using electric power comprising:

- a communication unit configured to receive power information including electric rate information [...]

Search strategy: two concepts

1) Smart grids = class Y04S40

2) Communication about tariffs and loads
## Example 2: Query Developer

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| Y04S40 | Main term | Information and tariff and consum* | | |
| Effects | Demand response | | | |

| Equivalents | (data or information or message or communicat*) and | |
| (cost, tariff, bill, price, rate?) and | (demand, consum*, load?) | |

| Embodiments | = | | | |
Example 2 - Results

Search Results from equivalents

(data or information or message or communicat*) and (cost, tariff, bill, price, rate?) and (demand, consum*, load?)

Hits: 217 docs
Relevant: 41 docs (19%) Set #1

Search Results from effects

“Demand-response”: (demand, load) prox/distance<3 respons*

Hits: 68 docs
Relevant -> 36 docs (53%) Set #2

New relevant documents (Set #2 not Set #1): 15
## Example 2: Result table

<table>
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<td>Equivalents</td>
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<tr>
<td></td>
<td>Embodiments</td>
<td>=</td>
<td>=</td>
<td>=</td>
</tr>
</tbody>
</table>
Comments on results

Queries based on **functional effects**:

- require a **contextual comprehension** of the function;
- are normally **more synthetic** and compact;
- lead to a **significant extension** of relevant results.

Working groups

- Examples from different technical fields
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Summary and conclusions

- **Functional feature identification**

- **Query builder**
  - Classification component (CPC / IPC)
  - Word component: Query developer (prism or table)
  - Build queries, based on
    - embodiments
    - equivalents
    - effects

- **Search**
  - Launch and record search statements
  - Isolate relevant results
  - Refine / complete the Query builder
Questions and comments