Search: art and science

Automotive & Mobility Seminar
Chicago, 26-27 September 2018
Art and science?

Gutenberg printing press
- search in wine and olive presses
- classify in printing presses

But Gutenberg also developed fonts to make printed bibles look hand-written
Searchers dilemma

1. How to search for a reference which is believed not to exist

2. How to recognise a reference in a different context or vocabulary

3. If no document is found, how to know when a search is complete

(Simmons, 1984)
Paper search

- Physical documents, mainly patents
- Could not combine groups
- Limited number of groups to search
- Main focus – high relevance documents
- Bottom of search pile = end of search
- No way to refocus the search
Electronic search

- Online databases
  - patents, journals, standards
- Other patent offices, the Internet
- Classification search in multiple classes and different schemes
- Cited/citing reference search
- Key-word searching in full-text
- Boolean operators, non-Boolean search
- Truncations & proximity operators
- On screen viewing, highlighting
- Automatic translations
Search landscape

- More and more patents, journals, standards, publications
- New important languages
- Technology is getting more complex, with new technology emerging faster, and merging with other fields
- Increase of background “noise “

➢ Effective and high-quality search depends on a good strategy
Goal of the search: Why?

- Prior art as a source of inspiration for R&D
- Novelty / inventive step search
- Claim drafting
- Opposition / Litigation
- Freedom to Operate
- Statistical analysis: trend, niches
- Expired patent search: free use
- ...

- For this presentation: the search carried out by European patent examiners for search reports and accompanying search opinions
Search strategy

What am I looking for?
Where will I look for it?
How will I look for it?

- The searcher learns more about what has to be searched during the process...
- ... continuously monitors the output...
- ...and adapts the search strategy accordingly
- The search process is not linear, but iterative.
Analysis of the application: **What?**

- Understand the full scope of the invention
- Beware of:
  - vocabulary issues
  - confusing apples and oranges (false analogies)
  - unusual parameters
  - searching for the irrelevant
  - Bias:
    - a mind not willing to see an invention
    - “this cannot be new!”
- Starting to search too soon
Build basic strategy: Where? How?

- References cited in application: e.g. patent documents
- Relevant applicants and inventors
- Classification: main classes for the invention
- Select key features and do an initial keyword search to find:
  - further keywords
  - synonyms and spelling variations
  - more relevant classes
- Ask experts in neighbouring fields

- Select databases

1. A dual clutch transmission is provided which includes a first and second input gears rotatable along a first axis and first and second clutches torsionally connected with the respective first and second input gears. First and second coaxial input shafts are
Where? Databases

- Online patent databases: EPODOC, WPI Derwent, ...
- Online journals: Non-Patent-Literature, Google Scholar
- External databases: Mintel GNPD, Chemical Abstract, INCI, SDOs
- Internet resources: Technical datasheets of suppliers, blogs (Google)
How? Plus/Minus of keyword search

- Easy and intuitive
- No knowledge reg. classes, applicants etc. necessary
- Good as a starting point to find out:
  - classes
  - synonyms
  - inventors and applicants

- Not all synonyms easily found
- Noise due to "common" keywords
- Homographs, abbreviations
- Machine translation quality
- Multiple language search more complex
How? Plus/Minus of class search

+ Restriction to a desired technical field
+ Keyword and language independent
+ Can combine several aspects of the invention

- Not always a fitting class / combination of classes
- Classification incompleteness
- Similar inventions may be classified differently
- Huge classes – search has to be refined anyhow
How? Main Classification schemes

- CPC (EP, US, WO)
- IPC (all WIPO member states)

- FI/F-Terms
  - Search directly at JPO

IPC Class B62D: Motor Vehicles; Trailers. Origin of non-CPC documents
### How? New Classification scheme

The B60Z scheme for autonomous driving

<table>
<thead>
<tr>
<th>B60Z</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B60Z 10/00</td>
<td>characterised by data acquisition, e.g. system configurations, detection algorithms and sensor fusion for environment perception</td>
</tr>
<tr>
<td>B60Z 20/00</td>
<td>characterised by the decision making process performing analysis, generation, or planning of a trajectory to control the vehicle</td>
</tr>
<tr>
<td>B60Z 30/00</td>
<td>Autonomous vehicle dynamic control</td>
</tr>
<tr>
<td>B60Z 40/00</td>
<td>Autonomous Vehicle communication interfaces</td>
</tr>
<tr>
<td>B60Z 50/00</td>
<td>Monitoring and diagnosing of abnormal vehicular conditions; Failsafe operation after diagnosis; Security; Safety override</td>
</tr>
<tr>
<td>B60Z 60/00</td>
<td>Services specially adapted for autonomous vehicles</td>
</tr>
<tr>
<td>B60Z 70/00</td>
<td>characterised by constructional details, e.g. seat arrangements or dashboard arrangements</td>
</tr>
</tbody>
</table>
How? Search tools

- Integrated Full text search
- Classes
- Free query
- Keywords
- Selection of databases
How? Search tools

- **Find similar**: non-Boolean search performed on text
- **Find figures**: search the relative position of elements in figures.
- **Asian documentation**:
  - Translation on the fly
  - Access to work done by Asian offices via:
    - Global Dossier
    - Common Citation Document
    - (both available via Espacenet)
Search results

- Evaluate results at every stage of the search
- Look at cited/citing documents selectively
- Assess outcome against expectations
- Remember goal of search:
  - Closest prior art
  - Novelty? Relevant for inventive step?
  - Background information?
- Adapt strategy as necessary - be flexible, but structured
- Change keywords, classification, classification scheme, database...
Search strategy iterations

1. Target from dossier analysis
2. References and keywords
   - Search in data bases
     - Highly relevant intermediate documents: Continue search
     - Less relevant documents: Adapt/modify strategy
6. Evaluation of documents found
7. End of the search
End of the search?

- Relevant documents for all aspects of the invention

or

- Run out of:
  - places to look?
  - ideas/strategies?
  - time?

- Expert colleagues consulted
- Always see the same documents
- Found relevant documents but published too late
- Closeness to application not improving
Art or Science?
What's next?