

## AI in the quest for an easier search

**CEPIUG 10th YAC**

Milano, Italy

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ÖPA Wien



Patent search by using semantic search

Intended use for initial searches (pre-searches)

6 semantic search providers compared

7 search exercises in Physics/Mechanics

Basic input: Derwent (WPI) Abstracts  
variations tried: - changing keywords  
- full-text input

Analysis of the first ranked 25 results  
(in view of human search)

Numbers in **bold** are loaded to Viewing Tool for further analysing  
Documents retrieved by AI Engine added to human list and compared

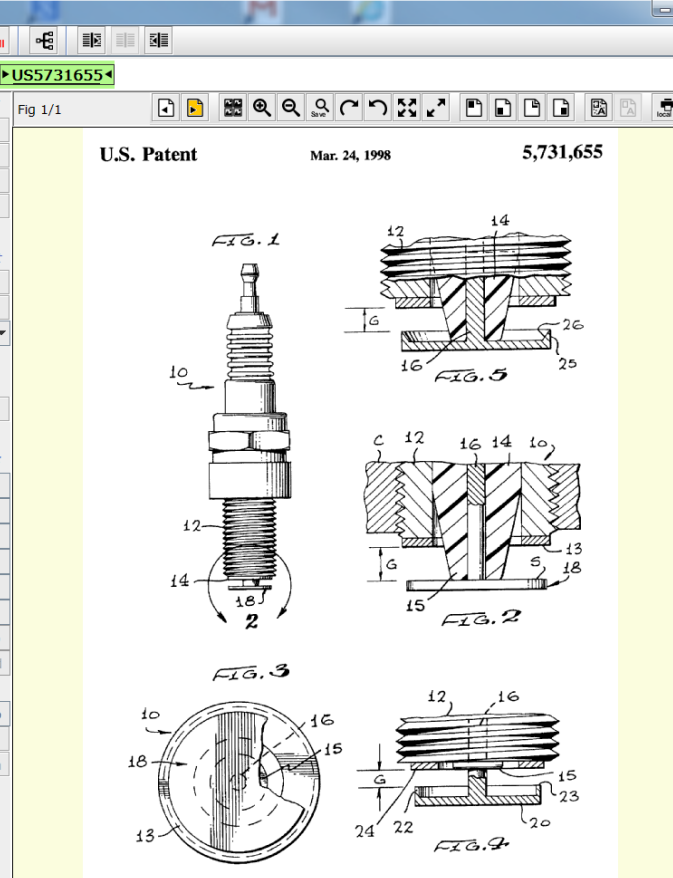
### Human Strategy for DE102014216582 A1:

**Abstract db:**

EPODOC	SS Status	Results	Query
1		1	EP675272?/PN
<b>2</b>		1.867	H01T13/467/C
3	Lim SS 2	57	PARALLEL+
4	Lim SS 2	92	RADIAL+
5	Lim SS 2	142	3 OR 4

**English ftext db:**

PATENW	SS Status	Results	Query
1		13.812	H01T13/20/C/IC/LOW
<b>2</b>		13.823	H01T13/20/C/IC/FILOW
3	Lim SS 2	7.338	GAP?
4	Lim SS 2	10.401	SPARK+
5	Lim SS 2	7.249	4 AND 3
6	Lim SS 2	2.780	PARALLEL+
7	Lim SS 2	3.334	RADIAL+
8	Lim SS 2	2.946	3 AND 4 AND 7
9	Lim SS 2	1.342	6 AND 8



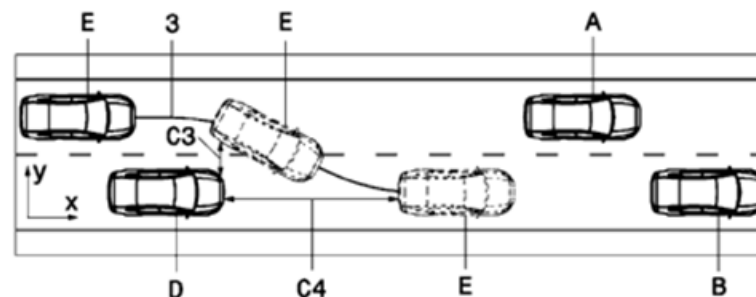
U.S. Patent Mar. 24, 1998 5,731,655

	AI 1	AI 2	TEQMINE	OCTIMINE	IPScreeener (AUTOMATCH)	INCOPAT
Technical subject matter recognised	61/155	44/175	64/175	80/175	101/175	98/175
Documents part of working list viewed by human	13/7000	0/8000	18/8000	4/8000	20/8000	0/8000
Documents which might be cited as "A"	5	2	2	5	8	14
<b>Documents which might be cited as "X" or "Y"</b>	1	2	1	1	3	2
<p><i>Input:</i> <i>Basic: WPI Abstracts</i></p> <p><i>Occasional variants:</i> - Changed keywords - Full-text</p>	Identic documents with different kind codes appear separately in the result list (many similar documents)	Starting document always appears on 1 <sup>st</sup> place of result list; Better results with full-text input in full-text dbs Enables input of documents in German	System trained with 16m full-text data; Full-text input recommended by the Provider which provides better results; New AI Model on the available	Requires input of technical areas; In one example all documents of a Family search report were retrieved, but nothing else	Abstract input recommended by the Provider; Possible restrictions to technical areas not practically relevant.	In most cases better results with full-text input;  Enables input of documents in German

**DE102016204957 A1**

**Trajectory decision module for automated comfort-oriented lane change of road vehicle**

The module includes properties such as effects of lateral dynamics, tyre track of grip, attention of borders of vehicle, real-time capability of an algorithm and dynamics of traffic conditions, where the traffic conditions alter an automatic lane. A vehicle out time is determined for the lane change. An aggressive lane change minimum time is determined for the lane change. Permissible time is determined for the lane change through comparisons of manoeuvre times.



	AI 1	AI 2	TEQMINE	OCTIMINE	<u>IPScreeener</u>	INCOPAT
Technical subject matter recognised	X	9/25	10/25	7/25	25/25	25/25
Documents part of working list viewed by human	X	0	1	0	5	0
Documents which might be cited as "A"	X	1	1	0	2	1
Documents which might be cited as "X" or "Y"	X	0	0	0?	2	1
Comments	Not carried out	Search with full text in full-text <u>db</u> s delivers better results 1 more "A" document		Cited documents from search reports of family members		

**EP2961250 A1**

**Assembly for Emitting light with LED and support element**

Light emitting arrangement e.g. LED module used for e.g. lighting room, has copper layers that are embedded in base material of multi-layer printed circuit board and are configured to serve as heat conductor

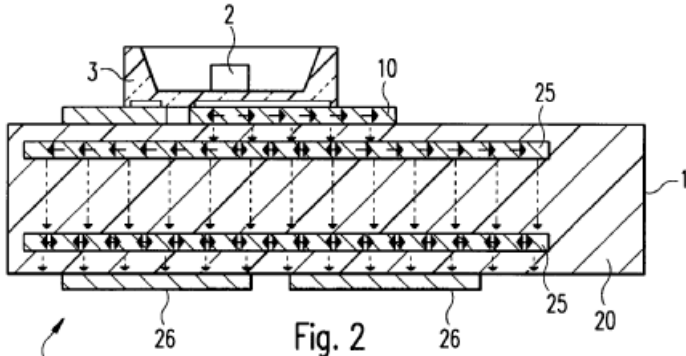


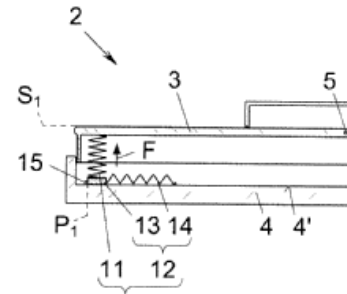
Fig. 2

	AI 1	AI 2	TEQMINE	OCTIMINE	<u>IPScreeener</u>	INCOPAT
Technical subject matter recognised	1/25	9/25	3/25	10/25	8/25	20/25
Documents part of working list viewed by human	0	0	1	0	0	0
Documents which might be cited as "A"	0	1	1	2	1	9
Documents which might be cited as "X" or "Y"	0	2	0	1	0	0
Comments		Starting document retrieved ; "A" document also retrieved by OCTIMINE	Result list contains a lot of LEDs with cooling arrangements	Search with full-text delivers worse results: no "A" document		Search with full-text delivers worse results: 2 "A" documents

**AT516096 A1**

**Keyboard**

Keyboard for musical instrument i.e. classical piano, has spring supported in keybed by shape memory alloy element, where element includes carriage slidingly mounted in keybed, and actuator moving carriage along inner bottom of keybed



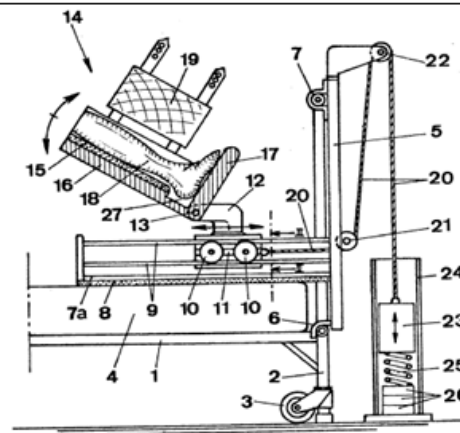
	AI 1	AI 2	TEQMINE	OCTIMINE	<u>IPScreeener</u>	INCOPAT
Technical subject matter recognized	12/25	4/25	0/25	18/25	25/25	20/25
Documents part of working list viewed by human	6	0	0	0	1	0
Documents which might be cited as "A"	3	0	0	0	3	3
Documents which might be cited as "X" or "Y"		0	0	0	0	1
Comments	Starting document retrieved; 4 Docs also found by AUTOMATCH and OCTIMINE	<u>Starting document retrieved</u>	All retrieved documents show springs consisting of shape memory alloy only	Starting document ranked at position 100!		„X“ document also retrieved by human search; search with full text delivers better results (5 "A" documents)

**DE3037619 A1**

**Leg Exerciser**

Bedridden patient leg-exercising instrument - comprises tilting footrest on support subjected to tension load

The stretching and bending instrument is for therapeutic gymnastic exercising of the legs, particularly by bedridden patients. It comprises a footrest tilting on a horizontal axis, and mounted in bearings on a support

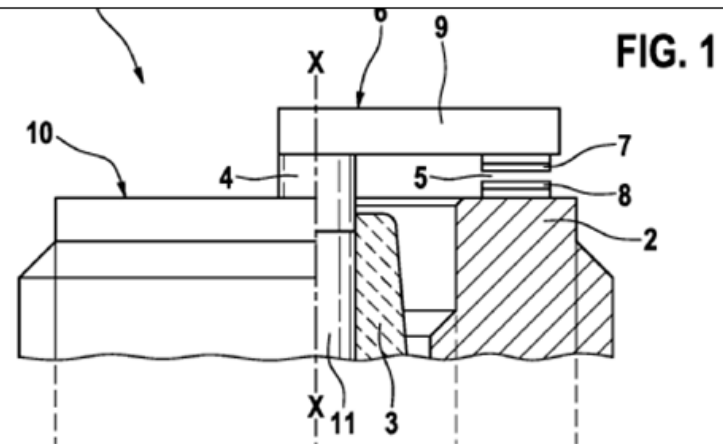


	AI 1	AI 2	TEQMINE	OCTIMINE	IPScreeener	INCOPAT
Technical subject matter recognised	3/25	1/25	17/20	2/25	15/20	7/25
Documents part of working list viewed by human	0	0	8	1	8	0
Documents which might be cited as "A"	1	0	0	0	1	1
Documents which might be cited as "X" or "Y"	0	0	0	0	0	0
Comments	<u>Starting document retrieved</u>	Starting document retrieved ranked at position 1; rest of the documents deal with wheel chairs!	Results close to technical subject matter	Many (non-therapeutic ) hospital beds in result list	Variations with rephrasing (changing keywords) of abstracts improved results	Search with Full-text retrieves better results (3 A documents]

DE102014216582 A1

**Spark plug**


Spark plug for internal combustion engine for use in automotive application, has insulator that is arranged in housing, while forming spark gap parallel to longitudinal axis of spark plug and spaced from longitudinal axis of spark plug



	AI 1	AI 2	TEQMINE	OCTIMINE	IPScreeener	INCOPAT
Technical subject matter recognised	25/25	20/25	20/20	25/25	25/25	25/25
Documents part of working list viewed by human	5	0	6	2	11	0
Documents which might be cited as "A"	0	0	0	0	0	0
Documents which might be cited as "X" or "Y"	0	0	1	0	1	0
Comments	2 documents also retrieved by DERWENT	Original document retrieved, ranked at position 1	„X“ document also retrieved by human search	The retrieved spark plugs rarely show the searched feature elements	“X” document which was <u>not</u> retrieved by human search!	Search with Full-text retrieves better results (1 “A” document)

**EP1152305 A1**  
**Analog clock with date display**

Analogue clock with date display is controlled so that additional information is always displayed in an area not covered by the hand(s)

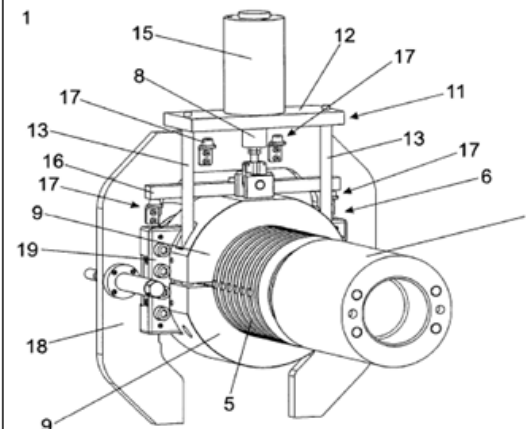


	AI 1	AI 2	TEQMINE	OCTIMINE	<u>IPScreeener</u>	INCOPAT
Technical subject matter recognised	20/25	1/25	10/20	10/25	0/25	1/25
Documents part of working list viewed by human	2	0	2	1	0	0
Documents which might be cited as "A"	1	0	0	1	0	0
Documents which might be cited as "X" or "Y"	1	0	0	0	0	0
Comments	Keywords Changed to watch, indicator: 5 documents in working list; full-text search gives 1 additional "X" document	Original document retrieved; rest of results show chem. compounds; keywords changed to watch, indicator: 12 watches	Performed with <u>Fulltext</u> input	Results contain <u>many mechanical calibre!</u>	All results contain display devices with variable positions; keyword changed to watch and indicator improved results (1 "A" document)	Results contain many displays with variable positions; Full-text search retrieves better results: 15 watches

**AT517376 A1**

**Locking unit**

Locking unit of moulding machine e.g. injection moulding machine, has locking nut which is driven by main portion and/or coil from locked position to open position and/or from open position into locked position



	AI 1	AI 2	TEQMINE	OCTIMINE	<u>IPScreeener</u>	INCOPAT
Technical subject matter recognized	0/25	0/25	0/20	8/25	3/25	0/25
Documents part of working list viewed by human	0	0	0	0	0	0
Documents which might be cited as "A"	0	0	0	2	1	0
Documents which might be cited as "X" or "Y"	0	0	0	0	0	0
Comments	Results contain door locks only	Results contain door locks only	Results contain door locks only, Full text didn't improve results		Results show many door locks	Only door locks; Full text search retrieves better results: 8 locks for injection moulding; 2 "A" docs

Search language is basically English  
Required Text input (Full-text vs. Abstract) to be respected  
Full-text input sometimes distracting, sometimes delivers better results  
Machine translation sometimes incorporated  
Data coverage differs  
Non patent literature not covered  
Number of delivered results differ  
Statistic analysis available (IPC; CPC; Applicant; Countries...)  
Results sometimes evaluated by the system (match, relevant, noise)  
Results not unambiguous for different exercises  
Number of retrieved relevant documents still low  
Helpful as a valuable basis for more thorough searches