AI and Patent Law:

Friends or Foes? Frenemies?

Thomas L. Lederer

Diplom-Informatiker Univ. (MSc Computer Science)

German and European Patent Attorney

Munich

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"He who does not invent disappears.

He who does not patent loses."

Erich Otto Häußer (1930-99)
President of the German Patent Office 1976-95

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Overview

- Part One:

- What is a patent attorney?

- Overview History and Types of IP rights

- What are patents?

- Who owns a patent? Reasons to be inventive?

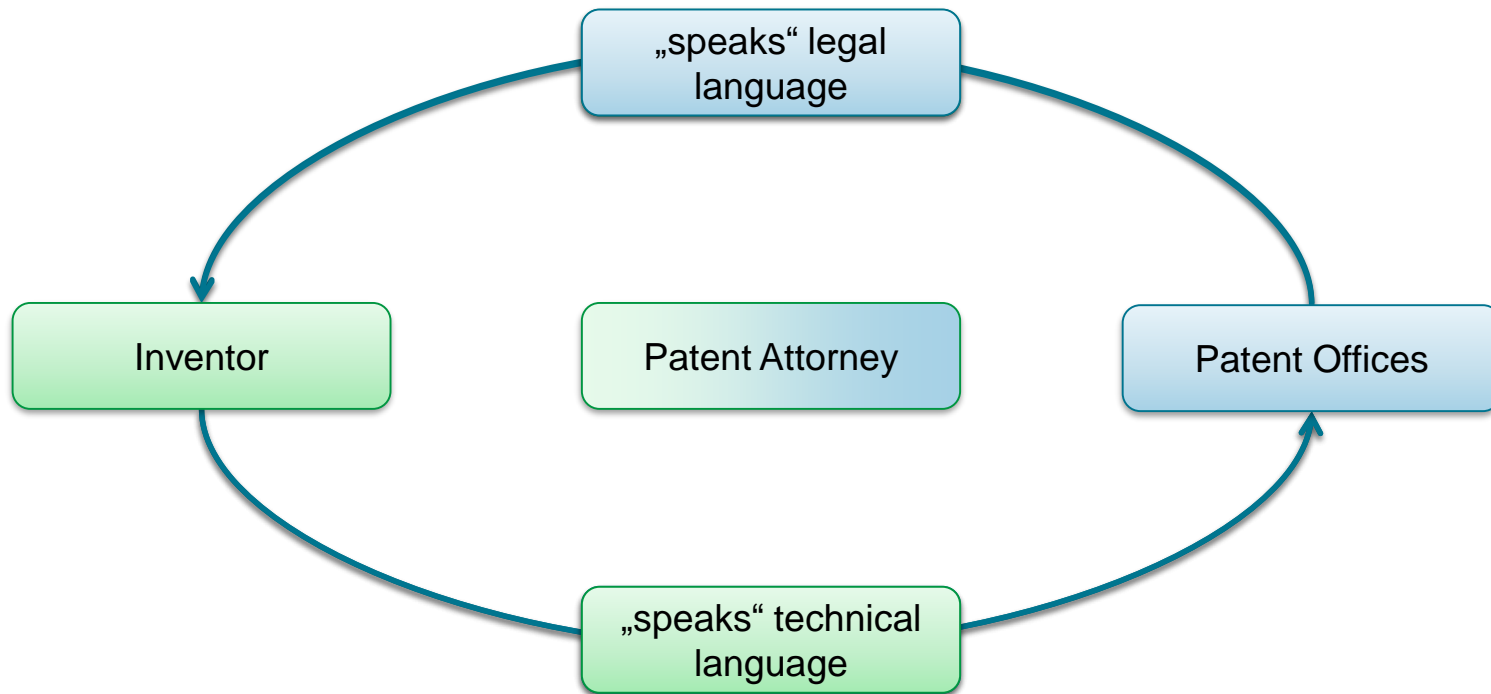- „*Software patents*" – computer implemented inventions (CII)

→ hand-off for Part Two

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What is a patent attorney?

- Patent attorneys in Germany: „*Technology and Law*" (since 1900)
- Specialized attorneys for intellectual property

- About me:
  - Technical degree: Master's level degree in computer science from the University of Munich (LMU München) – minor in statistics
  - Experience in industry (SUN Microsystems)
  - Obligatory 3-year apprenticeship in a patent law firm (German route)
  - Specialized law degree "*Law for Patent Attorneys*"
  - Working in Intellectual Property since 2007

- In Germany there are about 3800 Patent Attorneys
  - almost all have the European Qualification
  - but only about 50 have a degree in Computer Science

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What does a patent attorney?

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            „speaks" legal
               language

Inventor     Patent Attorney     Patent Offices

            „speaks" technical
                language
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- "Translating" (i.e. representation before offices and courts) is only one part. Other parts are:
    - Advising on strategies,
    - Drafting of patent applications,
    - Freedom-to-operate analysis,
    - Oppositions, Appeals, etc…

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Overview History and Types of IP rights

- <u>Early precedents:</u> about *720 BCE* in **Ancient Greece**

- <u>Evidence:</u> **UK** *1331*; **IT** *1421*; **FR** *1555*; **DE** *16th cent.*; **US** *1641*

- <u>Codified laws:</u> **Venice, IT**: *1474*; **UK**: *1624*; **USA**: *1790*;
    FR: *1791*; **DE** (suggested i.a. by Siemens): *1877*;
    NL (final European country): *1920*;
    European Patent Convention (EPC): *1973*,
    in force: *1977*

	technical	**non-technical**
- common - well-known	**patent** (20 years)	**trademark** (10 years, renewable)
- not so common - not so well-known	**utility model** (10 years)	**design patent** (25 years)

There is also copyright: (no application/registration necessary, valid for 70 years after death of creator)

What is a Patent

- Technical intellectual property right

- Tech. solution of a tech. problem

- Art. 52 (1) EPC:

  "*European patents shall be granted for any <u>inventions</u>, in all fields of <u>technology</u>, provided that they are <u>new</u>, involve an <u>inventive step</u> and are susceptible of <u>industrial application</u>.*"
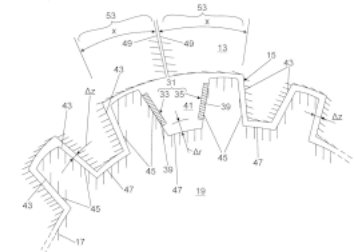

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What is a Patent: Parts of a Patent

- **Description**
  - Here, the invention will be described starting from the known prior art so that a person skilled in the art can re-work it. Various embodiments can be detailed.
- **Claims**
  - The patent claims determine the scope of protection of the patent. The description merely helps understanding the condensed claims. In case of doubt (in court), the claims alone are used to determine the extent of protection afforded by the patent.
- **Drawings**
  - The drawings contain pictorial representations of the embodiments, and help reading and understanding the description and claims. The drawings may sometimes contain valuable details.
- **Summary**
  - The summary or abstract is intended to identify the field of the invention and to reflect the gist of the patent. It is not part of the patent's disclosure.

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Novelty: Art. 54 (1),(2) EPC

"An invention shall be considered to be <u>new</u> if it does not form <u>part of the state of the art</u>. The state of the art shall be held to comprise everything made available to the <u>public </u>by means of a written or oral description, by use, or in any other way, <u>before the date of filing </u>of the European patent application."

The criterion of novelty is therefore met when there is no (single) disclosure in the prior art that shows the invention as a whole.

Prior art is all information that is available to the public at the time of application.

If the invention is different from each prior art document in only one (technical) feature, it is new or novel.

Therefore it is absolutely necessarily to keep the invention "*secret*"!

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Inventive step: Art. 56 EPC

"An invention shall be considered as involving an <u>inventive step</u> if, having regard to the state of the art, it is <u>not obvious</u> to a person skilled in the art. […]"

In other words: An invention is inventive if it is not obvious.

If the invention is disclosed by a combination from two (or more) prior art documents, the invention is deemed to be obvious, if the person skilled in the art could and would combine the sources.

A person skilled in the art is an average but omniscient specialist in the field of the invention.

Only that is considered which was published before the application date and is therefore held to be known by the skilled person.

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Industrial applicability: Art. 57 EPC

"An invention shall be considered as susceptible of industrial application if it can be made or used in any kind of industry, including agriculture."

Industrial application: any profit-making activity

There are rarely any problems with industrial applicability.

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"It is not enough that you invent something, you also have to realize that you invented something."

Karl Steinbuch (1917 – 2005)
Cyberneticist, Communications technician, Information theorist

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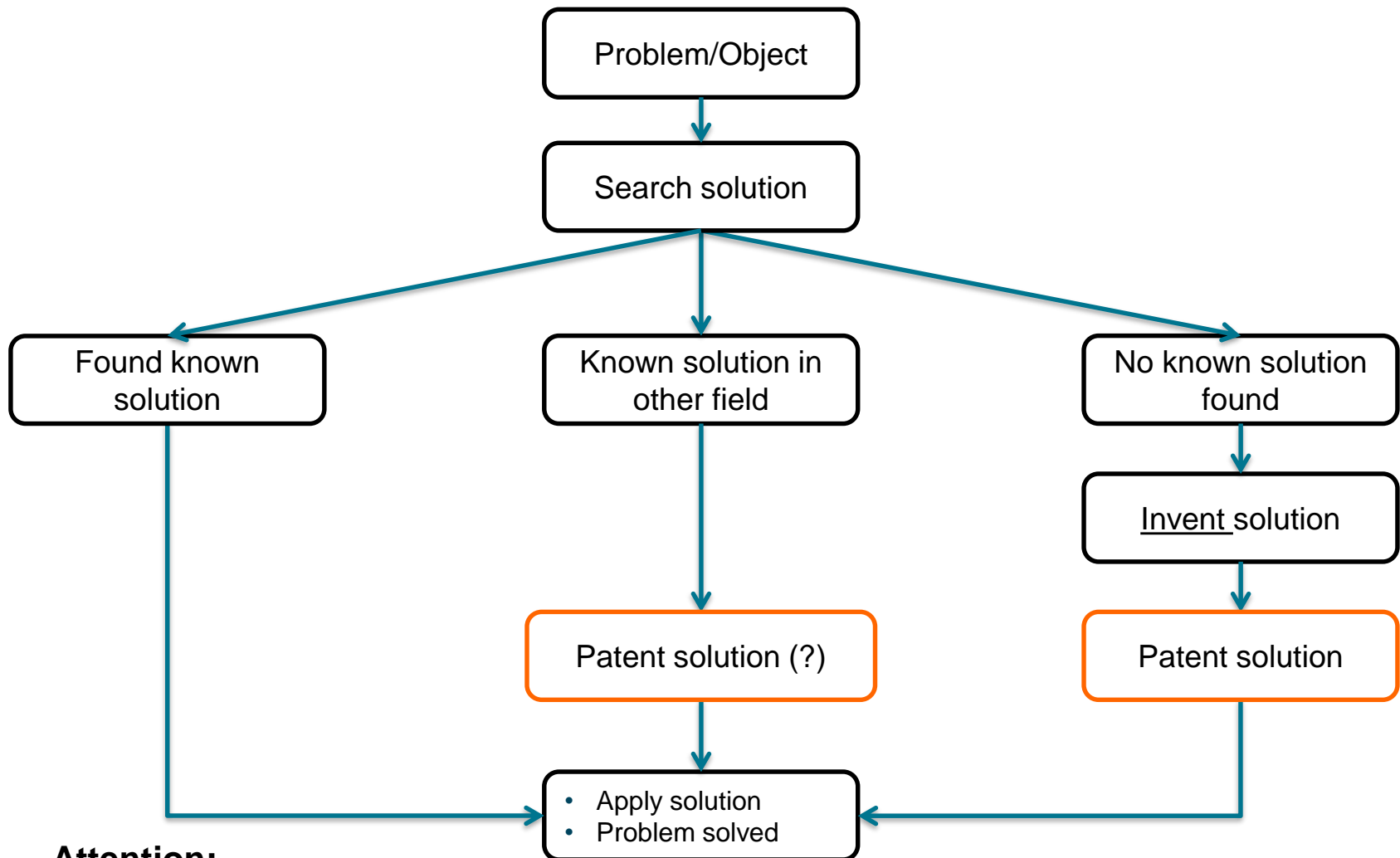
Attention:

- "*No known solution found*": There may still be one
- "*Patent solution*" means "*apply for patent*": success is not guaranteed
- The solution may violate existing patents

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Who owns a patent?
Reasons to be inventive?

- Employee invention law (Germany)
  - (Automatic) application for employees (not for freelance project work, partners, etc.)
  - Inventor's right (right to be mentioned, inalienable)
  - …..
- Reasons to invent:
  - Inventions claimed by the employer must be remunerated (But without notification (!) no remuneration, according to law)
    - Calculation of compensation not trivial….
  - Fame
  - Better CV

" In software, assume that everything is already patented. You can't build anything, no matter how new it is, without infringing someone's patent."

Tim Bray (1955 –)
Software developer and entrepreneur;
Co-author of XML specification

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„Software patents"

- The term "software patents" was introduced by opponents of these rights
- The official term is actually: computer-implemented invention
- "Software patents" do not exist in the law. Art. 51 (2) EPC:
  - *"The following in particular shall not be regarded as inventions […]:*
    - *discoveries, scientific theories and **mathematical methods**;*
    - *aesthetic creations;*
    - *schemes, rules and **methods for performing mental acts**, playing games or doing business, and **programs for computers**;*
    - *presentations of information."*
  - Art. 53(3): Restriction to programs for computers "*as such*"
- Software "*as such*" is already protected when writing by copyright
  - Reprogramming (with reformulations) allowed by copyright
- There is no special patent law. The same principles are applied to broom bristles and to artificial intelligence.

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Example: CII

DE 10 2012 019 033.6: „Method for outputting and archiving data"

Application date: 27 Sept 2012

1. *Method for outputting and archiving data in a data processing system or a data processing device, in particular with a PC,*

    characterized by an application of at least one DMS wizard (Document Management System) via a settings window of a module in a main menu (3) of a software for processing business processes;

    such that the data is processed automatically by the DMS wizard, the DMS being used and / or adjusted in a configuration wizard / DMS wizard (8); and

    wherein the data being output with a code, in particular a barcode, which is read by a code reader to archive the data.

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Example: AI

US 9,679,258 B2: <u>Methods and apparatus for reinforcement learning</u>

Application date: 05 Dec, 2013

„1. A method of reinforcement learning, the method comprising:

obtaining training data relating to a subject system being interacted with by a reinforcement learning agent that performs actions from a set of actions to cause the subject system to move from one state to another state;

wherein the training data comprises a plurality of transitions, each transition comprising respective starting state data, action data and next state data defining, respectively, a starting state of the subject system, an action performed by the reinforcement learning agent when the subject system was in the starting state, and a next state of the subject system resulting from the action being performed by the reinforcement learning system; and

training a second neural network used to select actions to be performed by the reinforcement learning agent on the transitions in the training data and, for each transition, a respective target output generated by a first neural network, wherein the first neural network is another instance of the second neural network but with possibly different parameter values than those of the first neural network; and

during the training, periodically updating the parameter values of the first neural network from current parameter values of the second neural network,

wherein the state data and the next state data in each transition are image data.

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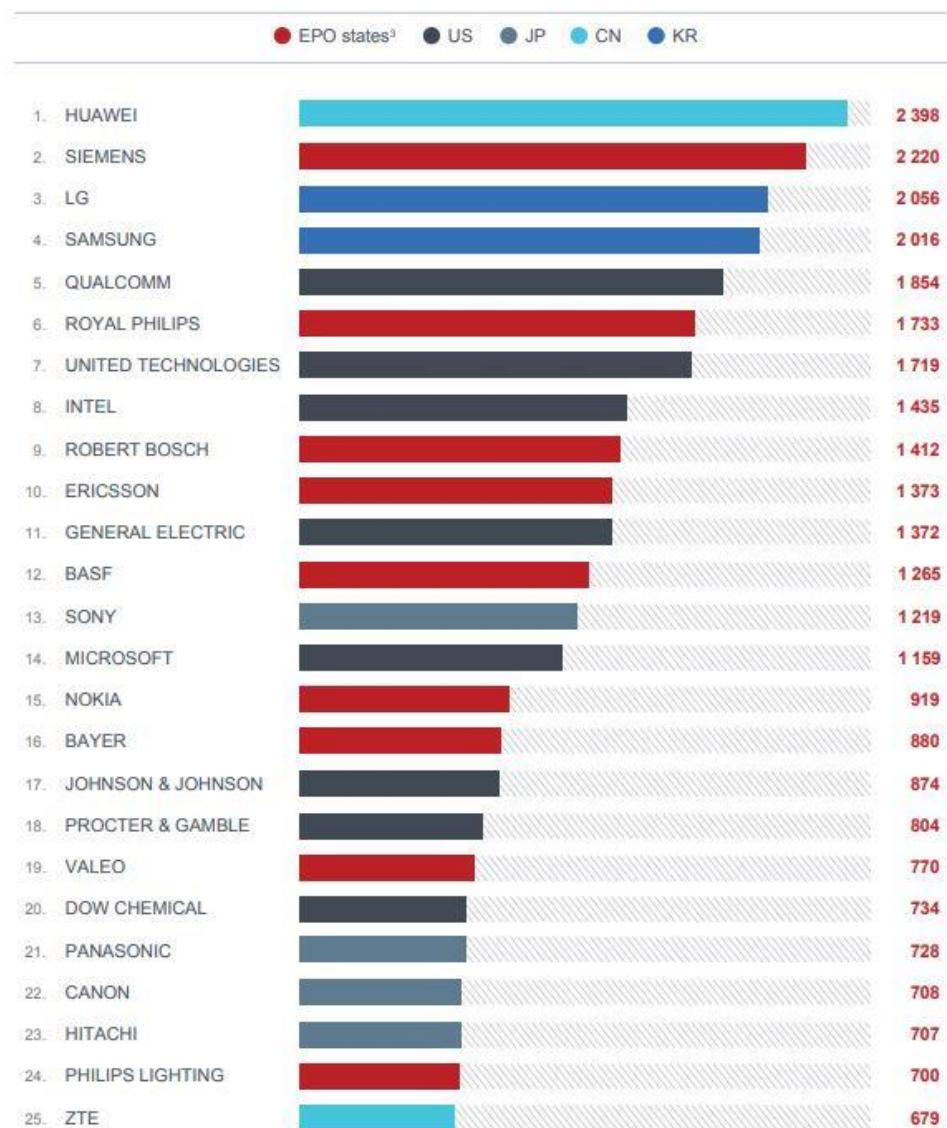| in 2017	DPMA	EPA
Total Patent Applications	67 707 (DE + DE-Phase)	165 590 (EP + EP-Phase)
German Applicants	47 779 (29 993 BW+BY)	25 490 (2. after US)
Granted Patents	15 653	105 635

EPA: 1. Medical technology 13 090

2. Digital communication 11 694

3. Computer technology 11 174

…

DPMA: 1. Transport 11 469

2. Electrical maschines and devices electrical energy 7 209
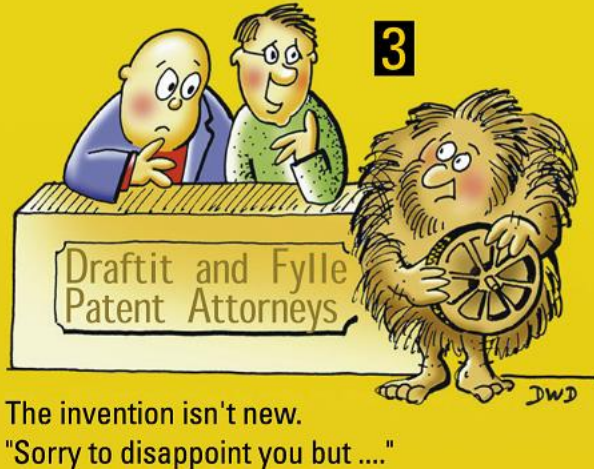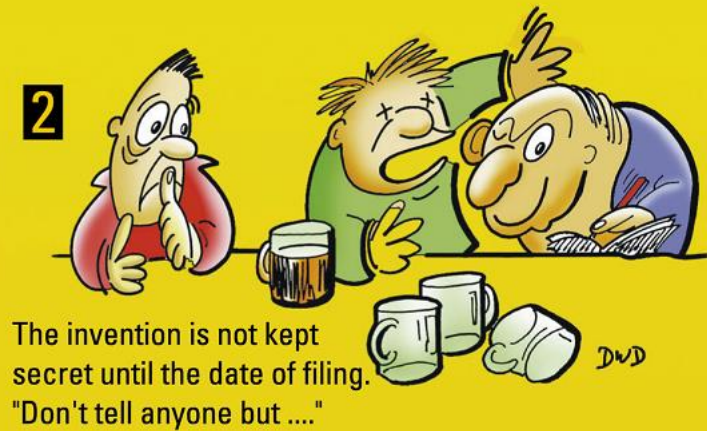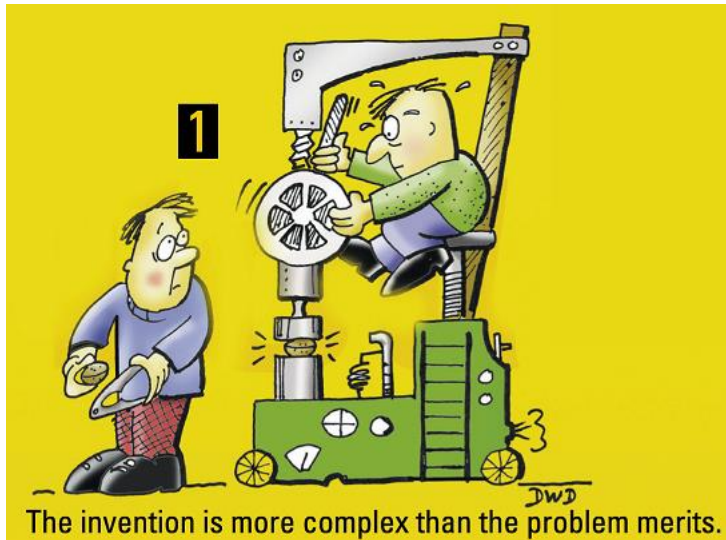
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1.12 The 50 most active companies and institutions at the DPMA (number of national patent applications filed in 2017)

	Applicant	Principal place of business		Applications
1	Robert Bosch GmbH	DE		4,038
2	Schaeffler Technologies AG & Co. KG	DE		2,383
3	Ford Global Technologies, LLC		US	2,047
4	Bayerische Motoren Werke AG	DE		1,776
5	Daimler AG	DE		1,588
6	AUDI AG	DE		1,266
7	ZF Friedrichshafen AG	DE		1,157
8	GM Global Technology Operations LLC		US	1,128
9	VOLKSWAGEN AG	DE		1,077
10	Siemens AG	DE		972
11	Continental Automotive GmbH	DE		542
12	BSH Hausgeräte GmbH	DE		533
13	FANUC Corporation		JP	527
14	Toyota Jidosha K.K.		JP	520
15	Dr. Ing. h.c. F. Porsche AG	DE		503
16	Infineon Technologies AG	DE		469
17	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.	DE		411
18	Miele & Cie. KG	DE		351
19	MAHLE International GmbH	DE		329
20	Hyundai Motor Company		KR	322
21	OSRAM Opto Semiconductors GmbH	DE		315
22	Taiwan Semiconductor Manufacturing Company Limited		TW	290
23	Henkel AG & Co. KGaA	DE		285
24	DENSO Corporation		JP	282
25	Continental Teves AG & Co. oHG	DE		268

This ranking shows the largest applicants[1] at the EPO, indicating their country of origin[2].

Legend: ● EPO states[3] ● US ● JP ● CN ● KR

1.	HUAWEI	2 398
2.	SIEMENS	2 220
3.	LG	2 056
4.	SAMSUNG	2 016
5.	QUALCOMM	1 854
6.	ROYAL PHILIPS	1 733
7.	UNITED TECHNOLOGIES	1 719
8.	INTEL	1 435
9.	ROBERT BOSCH	1 412
10.	ERICSSON	1 373
11.	GENERAL ELECTRIC	1 372
12.	BASF	1 265
13.	SONY	1 219
14.	MICROSOFT	1 159
15.	NOKIA	919
16.	BAYER	880
17.	JOHNSON & JOHNSON	874
18.	PROCTER & GAMBLE	804
19.	VALEO	770
20.	DOW CHEMICAL	734
21.	PANASONIC	728
22.	CANON	708
23.	HITACHI	707
24.	PHILIPS LIGHTING	700
25.	ZTE	679

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The "seven deadly sins" of the inventor

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The "seven deadly sins" of the inventor

Source: EPO

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Thank you very much for your attention.

Thomas L. Lederer
lederer@boehmert.de

Boehmert & Boehmert
Pettenkoferstraße 22
80336 Munich
Germany
T +49-89-55 96 80
F +49-89-55 96 85 090

BOEHMERT & BOEHMERT