

# **Patents and computer implemented Inventions**

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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

# Overview (not complete)

- What am I?
- Short history
- Different types of IP rights
- What are patents for?
- What are patents?
- „*Software patents*“ – computer implemented inventions (CII)
- Whom does the patent belong?
- Why should I invent something?

# About me

- 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)
  - Experience in industry (SUN Microsystems)
  - Obligatory apprenticeship for 3 years in a patent law firm
  - Specialized law degree “*Law for Patent Attorneys*”
  - Working in Intellectual Property since 2007
- In Germany there are about 3800 Patent Attorneys – only about 50 of them have a degree in Computer Science

# A Brief History of Patents

- Early precedents about 720 BCE in Ancient Greece
- Evidence: UK 1331, IT 1421, FR 1555, DE 16<sup>th</sup> century, US 1641
- Regulated laws in the modern age:
  - 1474: First Patent Act in Venice, Italy
  - 1624: UK
  - 1790: USA
  - 1791: France
  - 1877: Germany (on suggestion by Werner von Siemens)
  - 1910: The Netherlands (final European country)
  - 1973: European Patent Convention (EPC) – in force as of 1977

# Different types of IP rights

	<b>technical</b>	<b>non-technical</b>
<ul style="list-style-type: none"><li>- common</li><li>- well-known</li></ul>	<b>patent</b> (20 years)	<b>trademark</b> (10 years, renewable)
<ul style="list-style-type: none"><li>- not so common</li><li>- not so well-known</li></ul>	<b>utility model</b> (10 years)	<b>design patent</b> (25 years)

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

# Different types of IP rights

- Patent and utility model: for technical inventions
- Design patent: appearance, exterior form and color design of a product
- Trademark: text/image for marking goods and services
- Other right categories: plant variety right protection and Sortenschutz  
and integrated circuit layout design protection
- Copy right: Urheberrecht: works of literature, science and arts,  
and software (as such)

# Why Patents

- Recognition of the technical skill of the inventor
- Reward for the inventor for his effort and disclosure of the invention
- Promote willingness to develop / research / invent
- Invention must not be kept secret anymore after being protected
- Stimulation to find other solutions to same problem (workaround)
- "*Opposite*": Trade Secret
  
- Consequences of the legal monopoly (i.e. patent)
  - Prohibition: Patentees may prohibit others from producing patented product or using a patented process
  - But licensing possible (also compulsory license)

# What is a Patent

- Technical intellectual property right
- Technical solution of a technical problem
- For what is a patent granted?  
The “*subject-matter*” must be:
  - Novel
  - Inventive
  - Industrial applicable
  - (Technical)



## (12) Patentschrift

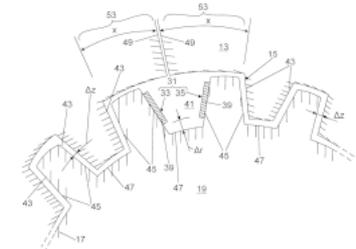
(21) Aktenzeichen: 10 2017 222 346.4 (51) Int. Cl.: **F16D 23/06** (2006.01)  
 (22) Anmeldetag: 11.12.2017 **F16H 55/18** (2006.01)  
 (43) Offenlegungstag: –  
 (45) Veröffentlichungstag der Patenterteilung: 18.10.2018

Innerhalb von neun Monaten nach Veröffentlichung der Patenterteilung kann nach § 59 Patentgesetz gegen das Patent Einspruch erhoben werden. Der Einspruch ist schriftlich zu erklären und zu begründen. Innerhalb der Einspruchsfrist ist eine Einspruchsgebühr in Höhe von 200 Euro zu entrichten (§ 6 Patentkostengesetz in Verbindung mit der Anlage zu § 2 Abs. 1 Patentkostengesetz).

(73) Patentinhaber: <b>AUDI AG, 85057 Ingolstadt, DE</b>	(56) Ermittelte Stand der Technik: <b>DE 195 45 519 B4</b> <b>DE 10 2014 213 133 B4</b> <b>DE 44 26 678 A1</b> <b>DE 10 2006 044 446 A1</b> <b>DE 10 2007 059 843 A1</b>
(72) Erfinder: <b>Kiesewetter, Jürgen, 91781 Weißenburg, DE</b>	

(54) Bezeichnung: **Gangschaltkupplung für ein Fahrzeuggetriebe**

(57) Zusammenfassung: Die Erfindung betrifft eine Gangschaltkupplung für ein Fahrzeuggetriebe, mit einer Getriebewelle (3) mit einem wellenfesten Synchronkörper (9), auf dessen Außenverzahnung (11) eine Schiebemuffe (13) mit ihrer Innenverzahnung (15) axial geführt ist, wobei die Schiebemuffe (13) in einem Schaltzustand in einer Axialbewegung in Zahneingriff mit einer Außenverzahnung (17) eines Loszahnrad (5, 7) gebracht sind, um eine Drehmomentübertragung zwischen der Getriebewelle (3) und dem Loszahnrad (5, 7) herzustellen, und wobei der Zahneingriff zwischen der Schiebemuffen-Innenverzahnung (15) und der Loszahnrad-Außenverzahnung (17) spielbehaftet ist, und zwar mit einem Zahnflankenspiel ( $\Delta z$ ), und wobei bei der Drehmomentübertragung die einander zugewandten Zahnflanken (43, 45) der Innenverzahnung (15) der Schiebemuffe (13) und der Außenverzahnung (17) des Loszahnrad (5, 7) unter Aufbrauch des Drehspiels ( $\Delta z$ ) miteinander in Anschlag kommen. Erfindungsgemäß wirkt zwischen der Schiebemuffe (13) und dem Loszahnrad (5, 7) zumindest eine Dämpfungsfeder (31), mittels der eine Anschlagbewegung der einander zugewandten Zahnflanken (43, 45) gedämpft wird.



# Parts of a Patent

- Patents consist (almost worldwide) of the following elements:
  - **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.
- Example: [EP0579655 – „Comvik“](#): „*Method in mobile telephone systems in which a subscriber identity module is assigned at least two identifiers that are optionally activated by the subscriber*“ (Patent revoked after opposition and appeal)

# Novelty

Section 3 PatG (German Patent Act): *"An invention shall be deemed to be new if it does not form part of the state of the art. The state of the art shall be held to comprise all knowledge made available to the public before the date governing the filing or priority date of the application by means of a written or oral description, by use or in any other way."*

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"!

# Inventive step

Section 4 PatG: *„An invention shall be deemed to involve an inventive step if, having regard to the state of the art, it is not obvious 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.

# Industrial applicability

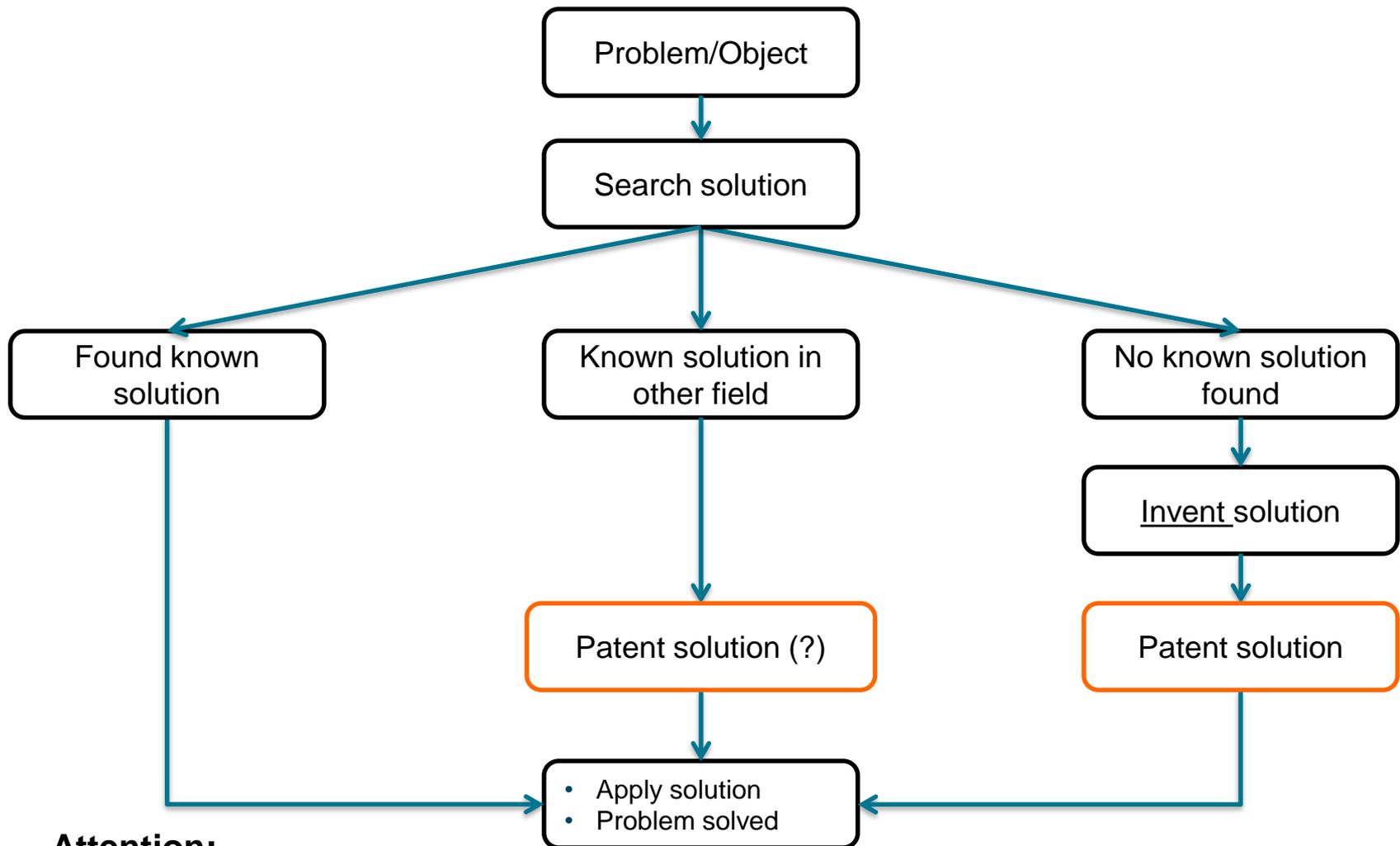
Section 5 PatG: *„An invention shall be deemed to be susceptible of industrial application if it can be made or used in any kind of industry, including agriculture.“*

Industrial application: any profit-making activity

There are rarely any problems with industrial applicability.

*"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



**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

# „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. PatG and EPC state:
  - *“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.”*
  - Later-on: Restriction to programs for computers "as such"
- Software “as such” is already protected when writing by copyright
  - Reprogramming (with reformulations) allowed
- There is no special patent law. The same principles are applied to broom bristles and to artificial intelligence.

# „Software patents“

- A patent protects an inventive idea
  - Term: computer-implemented invention
  - Reprogramming (the idea) not allowed
- Claims of computer-implemented inventions may e.g. be directed to:
  - a device programmed to perform an inventive mode of operation,
  - a computer-implemented method which carries out an inventive method,
  - a computer program product (data medium with code) which, when loaded into a computer, executes an inventive method.

# Examples: „Software patents“

*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.*

# Examples: „Software patents“

*JP2016018279: „DOCUMENT FILE SEARCH PROGRAM, DOCUMENT FILE SEARCH DEVICE, DOCUMENT FILE SEARCH METHOD, DOCUMENT INFORMATION OUTPUT PROGRAM, DOCUMENT INFORMATION OUTPUT DEVICE, AND DOCUMENT INFORMATION OUTPUT METHOD“*

*Application date: 04 July 2014*

- 1. In response to the registration of the document file,  
the index item extracted from the document file is stored in the storage unit in association with the document file,  
specification of the document type is accepted, and  
the stored document type and heading item specifies a heading item corresponding to the designated type of the document based on the correspondence relationship between the specified document item and the identified document item,  
searches for the document file associated with the identified item to be found in the storage unit,  
a document file search program for causing a computer to execute processing.  
(automated translation)*

# Examples: „Software patents“

*US 9,766,843 B2: „Document output processing“*

*Granted on 19 Sept 2017*

- 1. A method of compiling types of documents associated with events, the method performed by a computing device and comprising:  
receiving content data and receiving form data from a form data store, at least a part of the content data being obtained from a first set of document types associated with a previous event;  
determining a second set of compilable document types by analyzing the content data and the form data in response to receiving a command indicating that inputting of the content data is complete, the analysis conducted prior to receiving selected document types, the second set of compilable document types including a document type that is different from any of the types of documents in the first set and that is associated with an event that is different from the previous event;  
sending the second set of compilable document types;  
receiving the selected document types;  
generating a formatted document output set from the selected document types using the content data and the form data received from the form data store; and  
storing the document output set in a memory of an output device that is accessible to the computing device, the stored document output set being relayable to an electronic address.*

# Examples: „Software patents“

*EP 1 779 229: „Methods and apparatus for remotely controlling a document output device“*

*Application date 11 July 2005 – Granted on 27 Sept 2017*

- 1. A method for controlling a hardcopy document output device (320), the method comprising the steps of:*

*formulating at a client device (12) a control request as a set of instructions or information for use at the hardcopy document output device (320), including encapsulating the control request as the set of instructions or information in a packet containing a unique identifier that associates the control request with the hardcopy document output device (320), the unique identifier comprising one of a media access ID (10), an IP address, a telephone number, a serial number of the polling device (100), a serial number of the hardcopy document output device (320) associated with the polling device (100), or a vendor supplied identification;*

*receiving, at a server (50) for controlling a hardcopy document output device (320) to perform a function other than printing, the control request encapsulated in the packet in a message with a message address of the server (50), wherein the server (50) comprises any of a trusted or secure server, wherein the control request is sent from a client device (12) to the server (50) via a network (110);.....*

# Technicality (in Germany)

*“Subject-matter is considered to be technical if it is a teaching for planned action using controllable natural forces to achieve a causally visible success.”*

BGH (Federal Court of Justice): „Rote Taube“ – "Red Dove" 1969

*“If a teaching for a computer program for data processing apparatuses is characterized by insight based on technical considerations, then there is a discriminatory criterion that is also widely accepted and promotes a unified patent practice for Europe, which allows the identification of the required technical character of a teaching for a program for data processing equipment.”*

BGH: Logikverifikation – Logic Verification 2000

# Technicality (before the EPO)

- Excerpt! Constant change or further development – computer science is a relatively young science
- **Two identifiers / Comvik (T 641/00): technical, but not inventive.**
- *SIM card with two identifiers (e.g. business and private).*
- In an invention consisting of a mixture of technical and non-technical features and as a whole of a technical nature, all the features contributing to that technical character must be taken into account when assessing the requirement of inventive step, whereas those that do not contribute to that technical character can not support the presence of inventive step.

# Technicality (before the EPO)

- **Auction method/ Hitachi (T 258/03): technical, but not inventive.**
- *Internet-aided auction process, characterized by the auction rules.*
- The allegedly solved technical task was, in this case, not solved by the program, but rather circumvented. (In addition, it has been found that a method involving technical means of whatever kind is an invention, i.e., qualifies as technical.)
- **Circuit Simulation I / Infineon Technologies (T 1227/05): technical and inventive.**
- Concrete technical applications of computer-aided simulation methods have to be regarded as inventions within the meaning of Article 52 (1) EP, even if they include mathematical formulas. Circuit simulations have the required technical character because they are an integral part of the circuit fabrication process.

# Technicality (before the EPO)

- **Enlarged Board of Appeal (G 3/08):**
  - Diverging case law over time is a normal evolution in a changing world
  - While the practice of the EPO is not the only one imaginable, it does turn out to be predictable and reliable
- EPO: Case law has *allegedly* stabilized and offers the applicants of computer-implemented inventions a high degree of reliability

# Technicality (before the EPO – 2017)

- **T 1463/11:** Processing of payment processes, wherein "plug-ins" for different payment methods are installed on a central server (instead of a merchant's computer). This allows centralized installation and maintenance.
- **T 1284/13:** Concerns bookbinding and a preview image. Although the preview image is a representation of information, the exclusion does not apply here because the claimed subject-matter it is not about the information itself. Therefore, the invention is regarded to be technical.

# Technicality (before the EPO – 2017)

- T 2465/11 – the probability of a user being interested in specific data items
- T 0969/12 – that a user is a member of certain pre-defined groups
- T 1179/14 – adjusting a user's security rating in view of the security rating of that user's communication
- T 1135/11 – representation and processing of numbers representing "security levels"
- T 2073/11 – changing the recipient's name or address or even the "delivery status" of a delivery
- T 0535/15 – associating a piece of content with different rights during different "release windows"
- T 1221/12 – play lists
- T 2399/11 – track genre
- T 1098/12 – to enable users to try out software on a mobile terminal for a limited time at a lower price
- T 0797/11 – process planning and business optimization
- T 1232/12 – a fair trading environment
- T 1627/11 – performing a combined search on the internet and on files in the local file system
- T 1040/14 – being 'promotional'

# Side note: Licences

Be careful when using software in R&D

Institute for legal issues regarding free and open source software:

*“The GPLv3 contains an explicit patent license, according to which people who license a program under the GPL license both copyrights as well as patents to the extent that this is necessary to use the code licensed by them. [...] Furthermore, the new patent clause attempts to protect the user from the consequences of agreements between patent owners and licensees of the GPL that only benefit some of the licensees (corresponding to the Microsoft/Novell deal). The licensees are required to ensure that every user enjoys such advantages (patent license or release from claims), or that no one can profit from them.”*

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

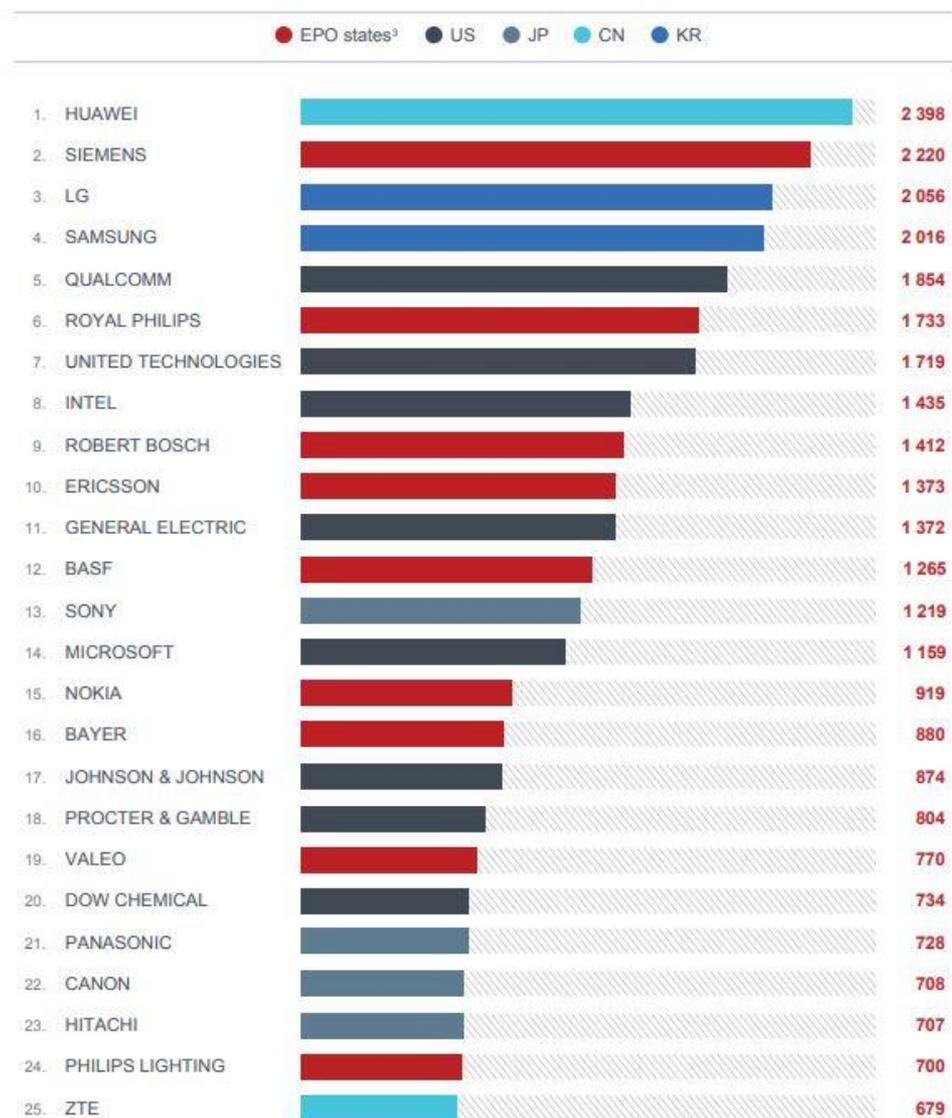
EPA: 1. Medical technology 13 090  
**2. Digital communication 11 694**  
**3. Computer technology 11 174**  
 ...

DPMA: 1. Transport 11 469  
**2. Electrical machines and devices 7 209**  
**electrical energy**  
 ...

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<sup>1</sup> at the EPO, indicating their country of origin<sup>2</sup>.



# Who owns the patent?

- Employee invention law
  - (Automatic) application for employees (not for freelance project work, partners, etc.)
  - Inventor's right (right to be mentioned, inalienable)
- Service invention: inventions made during the employment relationship (not just during working hours) resulting from the employee's activity at the workplace or based primarily on experience
  - Non-patentable suggestions: technical suggestions for improvement
- Free invention: non-operating area of employer
- Decision by employer – employee's obligation to report all inventions
- Employer can also release service invention
- Free and released inventions can be used by employees themselves
- Copyrights to software belong to the employer (without remuneration)

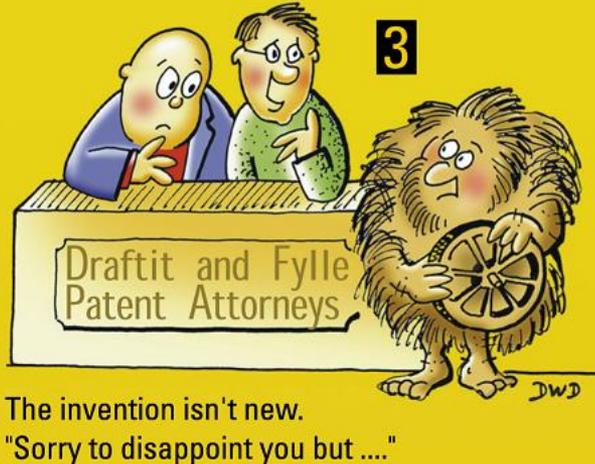
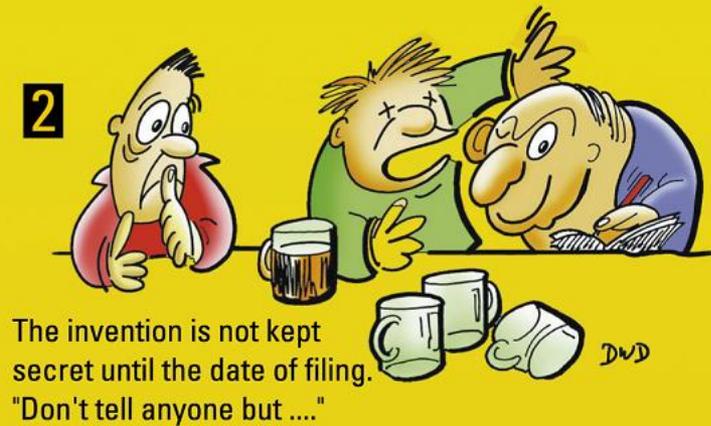
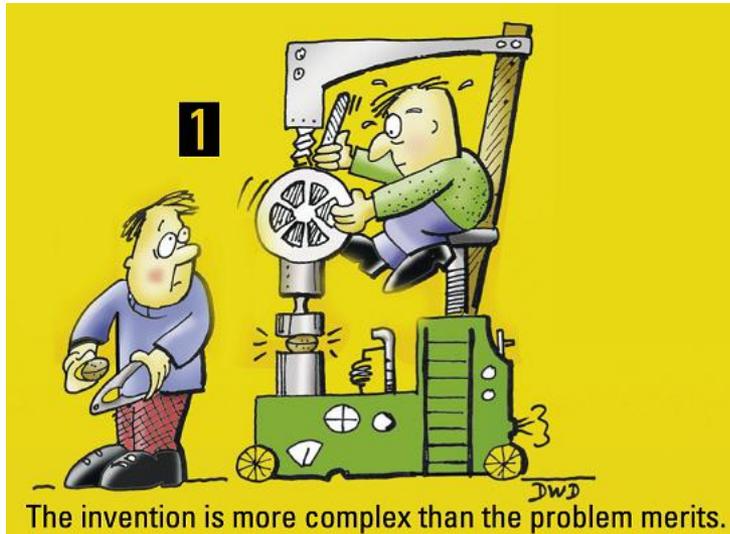
# Why invent?

- Inventions claimed by the employer must be remunerated (But without notification (!) no remuneration, according to law)
- Amount of compensation depends on many factors
  - Example:
    - Developer invents product with which employer makes about 250k€/year profit
    - Industry standard license rate, e.g. 2.5% (Free inventor/licensor would get 6250 €)
    - Share factor due to employment according to law (complex): approx. 20%
    - Employee inventor would receive 1250 €
- Problems: Turnover is not the same every year, development costs / duration, administration, expiry / abandonment of property rights
- Alternative: flat rate remuneration

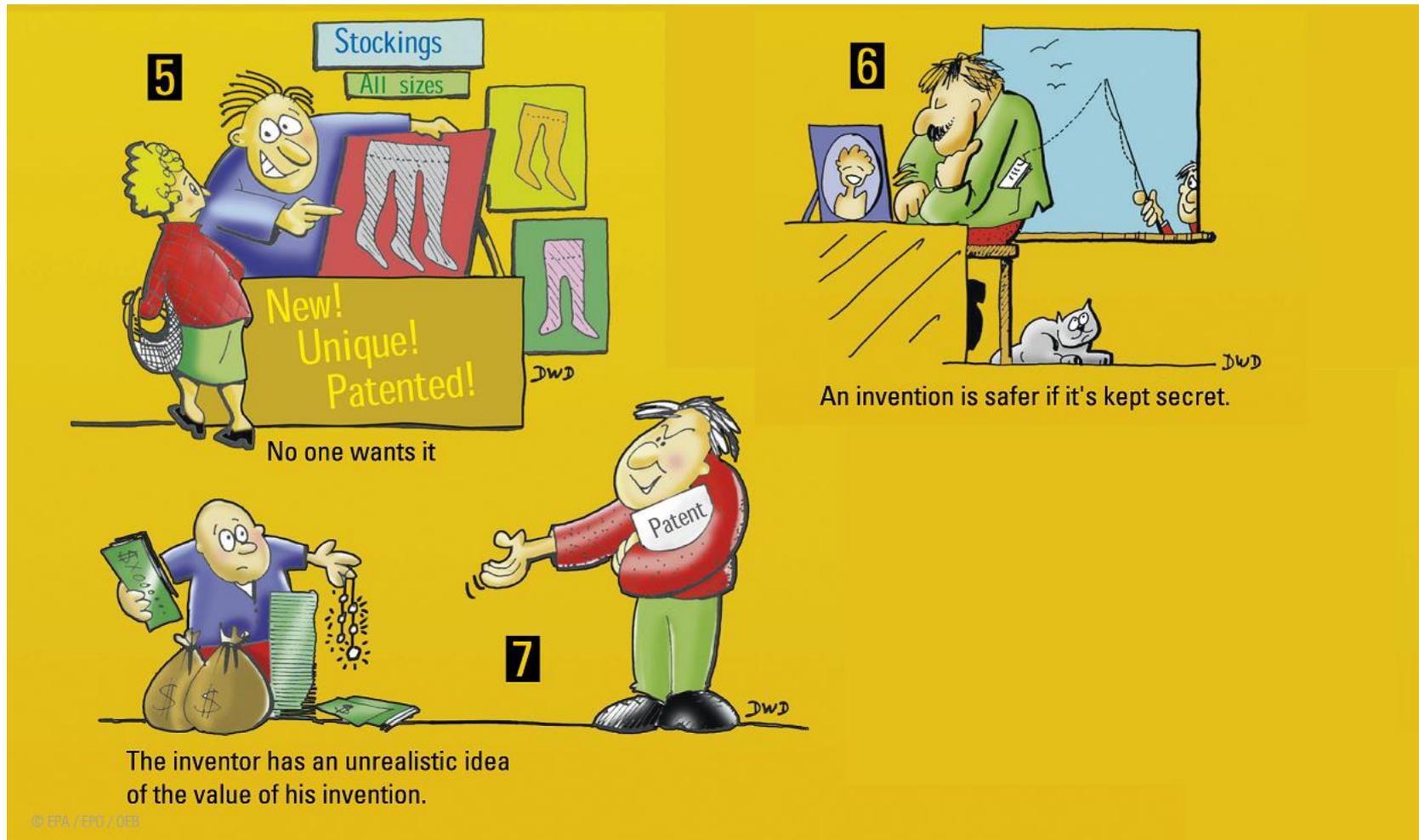
# How to notify an employer about invention

- Report the invention to the employer
  - Immediately (without culpable hesitation)
  - Separate (as a single notification)
  - In text form (e-mail, or similar)
  - In detail (notification, technical problem, technical solution, how was it invented, conclusion, inventor(s), known prior art, used funds, etc)
- Exact process varies by employer

# The “seven deadly sins” of the inventor



# The “seven deadly sins” of the inventor



Source: EPO

Thank you very much for your attention.

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