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Part I

- What is a patent?
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What is a patent?

- A patent is a **legal title** granting its holder the right to **prevent third parties from exploiting an invention for commercial purposes without authorisation**

- In return for this protection, the holder has to **disclose the invention** to the public

- Protection is granted:
  - for a limited period, generally 20 years
  - for a specific geographic area
Legal Aspects of Patent Protection

The Fundamental Deal of Patent Law - a Social Contract

full disclosure of an invention to the public

an exclusive right granted to the inventor
- to exclude anyone else from commercially exploiting the invention
- in a territory
- for a limited period
IP rights: what is a patent?

- A patent is the right to exploit an invention.
- The right to exclude others from making, using, selling or importing an invention.

**NO!**

Electric kettle

Kettle with ceramic heating element
A fair system driving knowledge transfer and innovation

- Find existing technology
- Learn from it
- Build on it

Technological innovation

Disclosure to the public

Patent application
Annual renewal fees: “a tax on innovation”?

- Applicants pay renewal fees every year in every country to maintain their rights – expensive!
- However, earlier application stages were cheaper!
- Renewal fees drive technology into the public domain.
<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusivity enables investment and higher returns on investment</td>
<td>Reveals invention to competitors (after 18 months)</td>
</tr>
<tr>
<td>Strong, enforceable legal right</td>
<td>Can be expensive</td>
</tr>
<tr>
<td>Makes invention tradable (licensing)</td>
<td>Patent enforceable only after grant (this can take 4-5 years)</td>
</tr>
</tbody>
</table>
## Alternatives to patenting

### Information disclosure (publishing)
- Cheap
- Prevents others from patenting the same invention
- Does not offer exclusivity
- Reveals the invention to competitors

### Secrecy (creating a trade secret)
- Cheap (but there is the cost of maintaining secrecy)
- Does not reveal the invention
- No protection against reverse-engineering/duplication of invention
- Difficult to enforce
- "Secrets" often leak quite fast

### Do nothing
- No effort required
- Does not offer exclusivity
- Competitors will often learn details
Can trade secrets be an alternative to patents?

- If the invention is a process (e.g. a process of manufacturing) "trade secrets" may be a viable alternative

- But trade secrets can leak out and, if they do, there is no protection

- Once the invention has been disclosed, it cannot be patented

- In other cases it may be preferable to keep inventing without patenting – simply keeping ahead of competitors by bringing new products onto the market faster than they do
What not to do when considering filing a patent application

- **No publication** prior to filing
  e.g. no article, press release, conference presentation/poster/proceedings or blog entry

- **No sale** of products incorporating the invention prior to filing

- **No lecture or presentation** prior to filing
  except under a **non-disclosure agreement** (NDA)

- **Seek professional advice** soon!
- **File before others do!**
Part I

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## Overview of intellectual property

<table>
<thead>
<tr>
<th>Legal right</th>
<th>What for?</th>
<th>How?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patents</td>
<td>New inventions</td>
<td>Application and examination</td>
</tr>
<tr>
<td>Copyright</td>
<td>Original creative or artistic forms</td>
<td>Exists automatically</td>
</tr>
<tr>
<td>Trade marks</td>
<td>Distinctive identification of products or services</td>
<td>Use and/or registration</td>
</tr>
<tr>
<td>Registered designs</td>
<td>External appearance</td>
<td>Registration*</td>
</tr>
<tr>
<td>Trade secrets</td>
<td>Valuable information not known to the public</td>
<td>Reasonable efforts to keep secret</td>
</tr>
</tbody>
</table>
Some IP found in a mobile phone

Trade marks:
• Made by "Nokia"
• Product "N95"
• Software "Symbian", "Java"

Patents:
• Data-processing methods
• Semiconductor circuits
• Chemical compounds
• ...

Trade secrets:
• ...

Copyrights:
• Software code
• Instruction manual
• Ringtone
• ...

Designs (some of them registered):
• Form of overall phone
• Arrangement of buttons in oval shape
• Three-dimensional wave form of buttons
• ...

© Nokia
Part I

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Patent office

PATENT OFFICE?

IT HASN’T BEEN INVENTED YET!
Structure of the European Patent Organisation

The European Patent Organisation consists of two main bodies:

**European Patent Office**
- **The executive body**
  - responsible for examining patent applications

**Administrative Council**
- **The legislative body**
  - made up of delegates from the member states
  - supervises the activities of the Office
  - has a specific legislative function
Our mission

As the patent office for Europe, we support innovation, competitiveness and economic growth across Europe through a commitment to high quality and efficient services delivered under the European Patent Convention.
38 member states

Albania • Austria • Belgium • Bulgaria • Croatia • Cyprus • Czech Republic • Denmark • Estonia • Finland • France • Germany • Greece • Hungary • Iceland • Ireland • Italy • Latvia • Liechtenstein • Lithuania • Luxembourg • Former Yugoslav Republic of Macedonia • Malta • Monaco • Netherlands • Norway • Poland • Portugal • Romania • San Marino • Serbia • Slovakia • Slovenia • Spain • Sweden • Switzerland • Turkey • United Kingdom

European patent applications and patents can also be extended at the applicant’s request to the following states:

Bosnia-Herzegovina • Montenegro
Our role in the European patent system

- We provide patent protection in up to 40 European countries based on a single application in one of the three official languages (German, English, French)

  European patent applications can be filed:
  - direct with the EPO
  - via the national patent offices of the contracting states
  - based on an international (PCT) application

- We are also responsible for
  - limitation and revocation proceedings by patentees
  - opposition proceedings by third parties
  - appeal proceedings before the Boards of Appeal

- We will also be in charge of granting and administering the future Unitary Patent of the EU
Highly skilled examiners

- Top-level engineers and scientists
  - high degree of technical expertise
  - knowledge of the EPO's three official languages

- Training during first two years
  - extensive legal and procedural training
  - individual coaching by experienced examiners

- Continuing professional development throughout career
### Number of staff in 2012

<table>
<thead>
<tr>
<th>City</th>
<th>Staff Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Munich</td>
<td>3,703</td>
</tr>
<tr>
<td>The Hague</td>
<td>2,617</td>
</tr>
<tr>
<td>Berlin</td>
<td>277</td>
</tr>
<tr>
<td>Vienna</td>
<td>107</td>
</tr>
<tr>
<td>Brussels</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,710</strong></td>
</tr>
</tbody>
</table>

Around 60% are patent examiners.
Part I

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What is an invention?

- **EPC**
  - European Patent Convention

Interpretation

- Guidelines for Examination in the EPO
- Case Law of the Boards of Appeal
Basic Requirements

European Patent Convention (EPC)

European patents shall be granted for:
- any inventions, in all fields of technology, provided that they
  - are new → A.54
  - involve an inventive step and → A.56
  - are susceptible of industrial application → A.57

What is an invention?
What is an invention?

No positive definition of an invention

EPC defines non-inventions:

The following, in particular, shall not be regarded as inventions:

a) discoveries, scientific theories, mathematical methods;
b) aesthetic creations;
c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;
d) presentations of information;

...only to the extent to which a European patent application relates to such subject matter or activities as such.
Exceptions to patentability as defined by the EPC ¹)

- Plant or animal varieties

- Methods for treatment of the human or animal body by surgery or therapy and diagnostic methods

¹) See Article 53 and Rule 28 EPC.
Exceptions to patentability as defined by the EPC 2)

- Inventions whose commercial exploitation would be contrary to "ordre public" or morality (e.g. processes for cloning of human beings)
What must an invention have?

An invention has **technical character**

- implicitly contained in the EPC

The invention must be of "**technical character**" to the extent that it
  - must belong to a field of technology → article 52(1) EPC
  - must relate to a **technical** field → Rule 42(1)(a) EPC
  - must concern a **technical** problem → Rule 42(1)(c) EPC
  - must have **technical** features in terms of which the matter for which protection is sought can be defined in the claim → Rule 43(1) EPC

- what is considered "technical"?
- interpret the EPC with Board of Appeal decisions
What is technical character?

- processing **physical data** parameters or control values of an industrial process

- processing which **affects the way a computer operates**
  - saving memory, increasing speed
  - security of a process, rate of data transfer etc.

- the **physical features of an entity**
  - memory, processor etc.
What is technical character?

<table>
<thead>
<tr>
<th>Further technical effect</th>
<th>No further technical effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>control of a brake in a car</td>
<td>aesthetical effects of music or a video</td>
</tr>
<tr>
<td>faster communication between mobile phones</td>
<td>new rules for an auction scheme</td>
</tr>
<tr>
<td>secure data transmission (encryption of data)</td>
<td>selling and booking sailing cruise packages</td>
</tr>
<tr>
<td>resource allocation in an operating system</td>
<td>calculation of a pension contributions</td>
</tr>
</tbody>
</table>
So what is an invention?

✓ Subject-matter *is not* excluded from patentability

✗ Subject-matter *is* excluded from patentability

- At least one feature has technical character
  => subject-matter has technical character.
Programs for computers

- Program for a computer "as such" is excluded from patentability (Article 52(2)(c) EPC), but…

- Not excluded from patentability if, when running on a computer, it causes a further "technical effect" going beyond the "normal" physical interaction between the program (software) and the computer (hardware)

- Programs for computers are therefore not automatically excluded from patentability
... This does not imply that all methods involving the use of technical means are patentable!

They still have to be

- new,
- represent a non-obvious technical solution to a technical problem,
- be susceptible of industrial application.
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EUROPEAN PATENT SPECIFICATION

Date of publication of patent specification: 16.12.92

Application number: 86302299.2

Date of filing: 27.03.86

Divisional application 92201226.5 filed on 27/03/86.

Process for amplifying nucleic acid sequences.

Priority: 28.03.85 US 716975
25.10.85 US 791308

Date of publication of application:
17.12.86 Bulletin 86/46

Publication of the grant of the patent:
16.12.92 Bulletin 92/51

Proprietor: F. HOFFMANN-LA ROCHE AG
Postfach 3255
CH-4002 Basel(CH)

Inventor: Mullis, Kary Banks
447 Beloit Avenue
Kensington California 94708(US)
What does a patent look like?

- **Bibliographic information**
  - Inventor, proprietor, date of filing, technology class, etc.

- **Abstract**
  - Around 150 words as a search aid for other patent applications

- **Description**
  - Summary of prior art (i.e. the technology known to exist)
  - The problem that the invention is supposed to solve
  - An explanation and at least one way of carrying out the invention

- **Claims**
  - Define the extent of patent protection

- **Drawings**
  - Illustrate the claims and description
What must be disclosed in a patent application?

- A detailed description of at least one way of carrying out the invention must be given.

- The information disclosed must be sufficiently clear to a person "skilled in the art" (Article 83 EPC) – this is called "sufficiency".

- The information disclosed is published in the patent document so that everyone can benefit from it.

- The disclosure of the invention in exchange for patent protection is also known as the "patent bargain".
Describing the invention

Computer Programs

- **program listings** in programming languages cannot be relied on as the sole disclosure of the invention

- **description:**
  - to be written substantially in **normal language**, possibly by flow diagrams
  - to be understood by a skilled person having general programming skills

- **short excerpts from programs** written in commonly used programming languages can be accepted if they serve to illustrate an embodiment of the invention

```plaintext
Inverse-Simulation (realData)
start
set parameters and rules of each society to random
for each society in the world
Create-Society (parameters, rules)
end for
while generation < maxGeneration
for each society in the world
Simulate-Society (parameters, rules)
fitness <- fitness-function(realData)
end for
SelectedRecombine-Society (fitness)
end while
optimumParameters-and-rules <-
parameters and rules of society[maxFitness]
return optimumParameters-and-rules
End
```
Disclosure of the invention: Article 83 EPC

- The inventor discloses how the invention works.
- The office checks if the invention is disclosed and issues a certificate of exclusive right (patent).
- The public generates legal certainty.
- The public represents the public.
A typical correspondence

**Examining Division**

The claimed matter is obvious to the person skilled in the art. (objection under Article 56 EPC)

But then, the application does not sufficiently disclose the invention to enable the person skilled in the art to carry it out. (objection under Article 83 EPC)

No. This adds subject-matter. (objection under Article 123(2) EPC)

**Inventor**

No, it isn't. The person skilled in the art is not aware of this. (argument)

Then I'll amend the application and put it in. (amendment)

Refusal of the application
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Categories of claims

Claim Categories

There are only two basic kinds of claim:

- **entity:** product, apparatus, device
- **activity:** process, method, use
Claim Categories

For many inventions, however, claims in more than one category are needed for full protection.

- systems consisting of apparatuses and devices
- storage media with computer program
- computer programs
- data structures
- signals
1. A **method** of operating a data processing system comprising steps A, B … .

Method claims **involving technical means** are not excluded under Art. 52(2) and (3) (*T258/03*)
Drafting of Claims - Apparatus Claim

2. a) A data processing **apparatus**/system comprising means for carrying out the method of claim 1.

   b) A data processing **apparatus**/system comprising means for carrying out steps A, means for carrying out step B ...

Apparatus/system claims are not excluded under Article 52(2) and (3) (*T931/95*)
3. a) A computer program [product] adapted to perform the method of claim 1.
   
b) A computer program comprising software code adapted to perform steps A, B...

4. a) A computer readable storage medium comprising the program of claim 3.
   
b) A computer readable storage medium comprising instructions to cause a data processing apparatus to carry out steps A, B ....

Types 3 and 4 are of the same nature, both are a consequence of T1173/97. Independent claims of these two types may exist together without infringing Rule 43(2)
Drafting of Claims

1. A method of operating a data processing system comprising steps A, B ... .

2. a) A data processing apparatus/system comprising means for carrying out the method of claim 1.
   
   b) A data processing apparatus/system comprising means for carrying out steps A, means for carrying out step B ... .

3. a) A computer program [product] adapted to perform the method of claim 1.
   
   b) A computer program [product] comprising software code adapted to perform steps A, B...

4. a) A computer readable storage medium comprising the program of claim 3.
   
   b) A computer readable storage medium comprising instructions to cause a data processing apparatus to carry out steps A, B....

These formulations can be allowed as additional independent claims if the method claim (type 1) is allowable (T1173/97)
To bear in mind ...

...on automation

- A mere automation of constraints imposed by the purely non technical aspects, such automation using conventional hardware and programming methods is considered to be obvious to a skilled person.

(T172/03; RICOH)
To bear in mind ...

...on automation

- It is the normal aim of the skilled person to attempt to automate a manual task as best as possible.

(T845/05; Minerva)
To bear in mind ... 

...on information

- Use of data processing means for processing or providing information of purely administrative, actuarial and/or financial character is not inventive.

(T931/95; PBS)
The task of designing diagrams is non-technical. This is so, even if the diagrams arguably convey information in a way which a viewer may intuitively regard as particularly appealing, lucid or logical.

(T125/04; CVA)
To bear in mind...

...on the presentation of information

- A specific manner of representation does not contribute to inventive step if conceived exclusively
  - with regard to a human being's mental capabilities,
  - with a view to aiding a user to visually analyse data and make decisions on the basis of this analysis;
and it does not relate to any technical format or structure of the information processed, nor is it linked to the internal functioning of the system.

(T125/04; CVA)
Asynchronous resynchronization of a commit procedure

1. A method for resource recovery in a computer system, said method, running an application (56 A), said application (56 A) requesting a work operation involving a resource, said method comprising the steps of:

   attempting to implement a commit procedure for said work request, whereby the commit procedure is not completed due to a failure at some time after said commit procedure fails;

   notifying said application (56 A) that it can continue to run, whereby said application (56 A) need not wait for resynchronization; and

   while said application (56 A) continues to run, resynchronizing said incomplete commit procedure for said resource asynchronously relative to said application (56 A).
20. **A computer program** comprising program code means for performing all the steps of any one of the claims 1 to 13 when said program is run on a computer.

21. **A computer program product** comprising program code means stored on a computer readable medium for performing the method of any one of the claims 1 to 13 when said program product is run on a computer.
Any questions?