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Patents and software

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ABSTRACT

• Definition of algorithm, computer program and software
• The Italian and European patent law
• How Computer Implemented Inventions (CII) are examined by EPO
• Fundamental decisions of the European Patent Office (EPO) in the field of CII
• Examples of CII inventions
BASIC DEFINITIONS

Computer program
- a sequence of computational steps which may be effectively performed by a digital computer;
- the steps of a computer program are written in a systematic notation known as a programming language;
- a computer program is also known as a “code”.

Software
- is often used as synonym for “computer program”;
- for some professionals the term software encompasses the media (e.g. diskette, CD, DVD) on which software is stored, as well as all kinds of documentation such as books and manuals that are delivered with the computer program.

Algorithm
- a systematic procedure for accomplishing a task in a finite number of steps;
- in the context of computers, the term algorithm is often used with respect to a set of ordered steps for solving a problem or providing an output from a specific set of inputs;
- in practice, the algorithm is the concept underlying a computer program.
COMPUTER IMPLEMENTED INVENTIONS

An algorithm can be implemented in a computer in many different ways.

The scope of protection of a patent should ideally protect all possible ways of implementing an algorithm.

The physical implementation of an algorithm can be made:
- through a computer program running on a computer, potentially in combination with specific circuits;
- only through specific circuits.

When an algorithm, wholly or partially implemented in a computer program, defines the concept underlying the invention, that invention is termed as a “computer implemented invention (CII)”.
WHAT IS A PATENT?

- A patent is an exclusive right which is granted to the Applicant in exchange of a disclosure of technical information.

Disclosure of the invention (Art. 83 EPC)
The European patent application shall disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

- The patent owner has the right of exploiting the patent for a period of 20 years from the filing date.
THE HUGE MISUNDERSTANDING

Q: Can patents for CII be granted?
A: Contrary to what many believe/assert, the answer is YES!

Q: Which criteria must be satisfied for obtaining a CII patent?
A: The criteria of the patent law.

Let’s have a look at the European Patent Convention (EPC) and to the Italian “Codice della Proprietà Industriale”.
ART. 52 EPC
(Patentable inventions)

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

2. The following in particular shall not be regarded as inventions within the meaning of paragraph 1:
   (a) discoveries, scientific theories and 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.

3. Paragraph 2 shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.
Rule 42 EPC
(Content of the description)

(1) The description shall:
(a) specify the technical field to which the invention relates;

[...]

(c) disclose the invention, as claimed, in such terms that the technical problem, even if not expressly stated as such, and its solution can be understood, and state any advantageous effects of the invention with reference to the background art;

[...]

Rule 43 EPC
(Form and content of claims)

The claims shall define the matter for which protection is sought in terms of the technical features of the invention.

[...]
ART. 45 CPI  
(OGGETTO DEL BREVETTO)

1. Possono costituire oggetto di brevetto per invenzione le invenzioni nuove che implicano un'attività inventiva e sono attre ad avere un'applicazione industriale.

2. Non sono considerate come invenzioni ai sensi del comma 1 in particolare:
   a) le scoperte, le teorie scientifiche e i metodi matematici;
   b) i piani, i principi ed i metodi per attività intellettuali, per gioco o per attività commerciale ed i programmi di elaboratore;
   c) le presentazioni di informazioni.

3. Le disposizioni del comma 2 escludono la brevettabilità di ciò che in esse è nominato solo nella misura in cui la domanda di brevetto o il brevetto concerne scoperte, teorie, piani, principi, metodi, programmi e presentazioni di informazioni considerati in quanto tali.
WHAT IS AN INVENTION?

There is no definition of “invention” in the patent law.

However, from the analysis of the Articles and the Rules of the EPC, we know that the invention must:

- have a technical character;
- relate to a technical field;
- involve technical capabilities (solution to a problem);
- be described with technical features.

An invention describes a technical solution to a technical problem.
WHAT IS “TECHNICAL”? 

There is no definition of the term “technical” in the patent law, as it is extremely difficult to find a definition which might be valid for all the technology fields and that might be valid also in the future.

Thus, reference must be made to the EPO Case Law containing the decisions taken by the Board of Appeals.

Examples of what is considered technical:

- processing physical data in a system which affects the control of an industrial process;
- processing which affects the way in which a computer operates such as a file compression algorithm;
- any physical apparatus such as a computer or any of its components are considered to be technical.
WHAT IS “NOT TECHNICAL”?

Purely abstract concepts are considered as non-technical.

Examples of what is considered to be non-technical:
- sales methods, trading, insurance schemes;
- business administration acts (choosing a candidate for a job);
- modeling a system;
- mathematical methods describing the physical effects of an electronic filter.

In other words, the activities falling within the frame of the “non inventions” tipically represent abstract concepts devoid of any technical implication.

Decision T258/03 - HITACHI.
DECISIONS OF THE BOARDS OF APPEAL

The requirement of technical character of an invention is satisfied only if a computer program is capable of causing a further technical effect when run on a computer. That is, a technical effect which goes beyond the normal technical effects, such as the flow of electricity in a computer, which are always present when program runs on a computer.

These normal effects are not sufficient to confer a technical character to a computer program.
LET’S MAKE THE POINT

1. An invention based on a computer program is defined a “computer implemented invention”.

2. According to the European Patent Convention, each invention must possess a technical character.

3. The Boards of Appeal of the European Patent Office provide an interpretation to the European Patent Convention and provide guidelines to distinguish what is technical from what is not technical.

4. The computer programs are excluded from patentability if they do not cause any further technical effect (“considered as such” of Art. 52(3) EPC).
STRUCTURE OF A PATENT / PATENT APPLICATION

- Title of the invention
- Abstract
- Description
- Claims
- Drawings

Let’s see an example of a patent ...
HOW A CII INVENTION IS EXAMINED BY EPO

1st Check: technical / not technical

If the claim contains at least a technical feature, then the invention is not excluded from patentability according to claims 52(2) and 52(3) of the EPC.

If the claim does not have technical character, then it is excluded from patentability.

If both technical and not technical features are present, they must be separated to investigate the inventive step.
The invention:

- is susceptible of industrial application?
  All CII inventions satisfy prima facie this requirement, as the computer programs and the computers may be industrially manufactured at large scale.

- is it new?
  if all features are known from a single prior art document, then the invention is not new.

- does it provide an inventive step?
  yes, if the invention provides a non obvious technical contribution with respect to the prior art → “Problem solution approach”
PROBLEM SOLUTION APPROACH
(how the EPO evaluates the inventive step)

1. Determine the closest prior art document.

2. Determine the differences between the invention (claim 1) with respect to the closest prior art and the relative technical effects.

3. Formulate an objective technical problem (it must be technical, must be solvable by a skilled in the art and must not contain any hint to the solution).

4. Evaluate whether the solution proposed in claim 1 of the invention is obvious for a skilled in the art.

The application of the “problem solution approach” is more complicated when technical aspects and not technical aspects must be assessed.
Comvik teaches that the technical contribution of the invention is decisive for evaluating the inventive step.

The evaluation of the inventive step requires:
- features contributing to the technical character of an invention;
- identification of a technical character;
- choice of the closest prior art document;
- selection of the skilled in the art.

When a claim refers to an objective to be reached in a non-technical filed, this objective may seem in particular a constraint which must be respected.
Ricoh teaches to identify first the clearly not technical features of the invention, and then to identify the clearly technical features of the invention.

In this specific case, the claimed invention distinguishes from a traditional distributed information system only in terms of functional features and data structures.

Since the claimed technical solution does not go beyond the idea of mere automation of constraints, is to be considered obvious by the skilled in the art.
Hitachi teaches that getting around a technical problem rather than solving it with technical means cannot contribute to the technical character of the claimed subject-matter.

In the specific case, adapting an auction method so that the transmission delay becomes irrelevant is not a technical solution.
AN EXAMPLE, GIVE ME AN EXAMPLE!

Computer implemented method for controlling a physical process:
1) by analysing a functional relationship between two parameters, the method comprising:
2) [a series of mathematical steps for generating data able to extend the range of one of the two parameters]
3) wherein the data generated at point 2) are used for controlling the physical process.

Clearly technical aspects

- Computer implemented method
- Method for controlling a physical process

Clearly non-technical aspects

- Analysing a function relationship between two parameters
- A series of mathematical steps
  wherein data are generated, said data being able to extend the range of one of the two parameters

CONTRIBUTES TO THE TECHNICAL CHARACTER
HEM, PERHAPS ANOTHER EXAMPLE!

Computer implemented method for carrying out an order:
- enter the order information in a computer, wherein the order information comprises an order code;
- store the order information in a computer;
- send order data, said order data comprising said order code, to a central management unit for processing said order.

Clearly technical aspects

- Computer implemented method
- Entering and storing data in a computer
- Sending order data to a central management unit for processing the order

Clearly non-technical aspects

- Storing the order information
- The order information comprises an order code
- Sending the order information to a central management unit for processing the order.
CLAIM CATEGORIES

Method claims

Apparatus/System claims

Computer program claims

Storage medium/data carriers with computer program claims

Signal claims

Data-structure claims
CLAIM EXAMPLES

Claim 1 - Method

A method of operating a data-processing system comprising steps
- A
- B
- C

Claim 1 - apparatus

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

or

A data processing apparatus/system comprising means for carrying out step A, means for carrying out step B, and so on.
CLAIM EXAMPLES

Claim 1 - computer program

A computer program product adapted to perform the method of claim 1.

or

A computer program comprising software code adapted to perform steps A, B, and so on (when executed on a data-processing apparatus/system).

Claim 1 - storage medium/data carrier

A computer readable storage medium/data carrier comprising the program of claim 1.
EXPERT SYSTEM FOR MEDICAL DIAGNOSIS
EP 0 316 861

EP 0 316 861 relates to a medical expert system for diagnosing blood conditions based upon input data obtained from a patient’s blood. Conventionally, diagnosis of these conditions was performed by an expert physician mentally on the basis of the data given to him and his expert knowledge.

Prior computer systems for assisting with the diagnosis were known but, according to the patent, these were too complex to be used by physicians who were not also computer experts.

A stated object of the invention is to provide a diagnosis system which does not require extensive training in computer technology for its operation.

While mental processes for diagnosis of medical conditions are inherently unpatentable, providing facilities in a computer system for such purposes which render the system easy to operate may result in a patentable invention.
EP 0 381 332 relates to a simulation system which is capable of simulating electrical circuits which include analogue components, the process described having the object of enhancing the speed of operation.
EP 0 388 156 relates to a software for generating output sentences, in accordance with the grammatical rules of the output language, in a natural language translation system.
SAVING MEMORY SPACE
EP 0 134 543

EP 0 134 543 relates to techniques for compressing text so that the stored text takes up less memory space.
FINANCIAL AND TRADING SYSTEMS

EP 0 838 063

EP 0 838 063 relates to a computer system with software for making calculations relating to particular kinds of financial instruments for the funding of loans, specifically particular kinds of mortgages. Prior to the invention, it had been apparently impossible to computerise such a system.

The technical problem, therefore, was to develop an algorithm which would make this possible and this is the underlying basis for the patentability of this invention.
EPO GRANTS PATENTS IN THESE TECHNICAL FIELDS:

ARTIFICIAL INTELLIGENCE
   General purpose expert systems
   Expert systems for medical diagnosis
   Expert systems for fault diagnosis
   Expert systems for machine and process control
   Neural networks

BUSINESS AND PRODUCTION MANAGEMENT SYSTEMS

CAD/CAM SYSTEMS

COMPUTER GRAPHICS

COMPUTER PROGRAMMING AND OPERATING SYSTEMS

DATABASE
EPO GRANTS PATENTS IN THESE TECHNICAL FIELDS:

FINANCIAL AND TRADING SYSTEMS

INTEGRATED CIRCUIT DESIGN

NATURAL LANGUAGE PROCESSING
  - Machine translation
  - Sentence analysis

OPTIMISATION SOFTWARE

SCIENTIFIC ANALYSIS

SIMULATION SOFTWARE

SPEECH RECOGNITION
EPO GRANTS PATENTS IN THESE TECHNICAL FIELDS:

SPEECH SYNTHESIS

SPREADSHEETS

TEACHING SYSTEMS

USER INTERFACES

WORD PROCESSOR
- Editing, Text Manipulation and Formatting
- Linking different programs
- Saving memory space
- Spell checking
THANK YOU VERY MUCH!

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