

## **What is technical in Europe? Patentability of data processing.**

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(Paper presented by: Marek Lazewski, Patent Attorney, S. Lazewska & Son at the Vth Common Seminar on Industrial Property organized by the Polish Group of AIPPI and German Group of AIPPI)

The following paper attempts to analyse the legal theory and practice behind the requirement of technical character. Geographically the research has been restricted to Poland, Germany and the EPO. We are therefore dealing with three quite different jurisdictions:

- Poland, where the requirement was directly present in the law;
- Germany, where the requirement was construed by the judiciary and applied repetitively as a general concept fundamental to the patent law;
- EPO, where the requirement seems to serve to define the interplay between the list of non-inventions in art. 52 (2) EPC and the statement that they should only be considered non-inventions when applied for “as such”, the requirement is applied on a case-by-case bases.

It is hoped that those three examples should be useful in shedding some light on the concept which seems to emerge as the decisive test for computer-implemented inventions and the so called business-method patents.

### **1. Why technical?**

The first question that needs to be addressed with respect to the requirement of technical character is the legal bases on which such a requirement is ever brought up.

Art. 10 of Polish Law on Inventions which went out of force in August 2001 contained a definition of the invention as “a solution to a technical problem” and further for it to be patentable required novelty, non-obviousness and industrial applicability. This law will still be applicable to all applications and patents filed prior to 22 August 2001, therefore it remains relevant with respect to Polish legal system. Furthermore the analysis of the past practice of judicial bodies and the legal theories developed may be very useful in the discussion. This requirement was in fact explicitly mentioned since the Law on inventions of 1962.

Second potential source of the requirement is the nature of the invention. In particular the German practice seems to have evolved based on that principle. Polish legal scholars<sup>1</sup> have also argued that when talking about patentable subject matter one will be always in the domain of the technology. Therefore, the definition of technology is fundamental for the definition of an invention.

In order to support this general position one may use a number of provisions which indirectly suggest that the subject matter to be granted protection needs to belong to the domain of technology.

The requirement of novelty is described (art. 25 (1) Polish Industrial Property Code – IPL) as the invention not forming part of prior art. Although the English language version does not suggest a technical character of the art the German „Stand der Technik, French ” „l’etat de la technique” and Polish “stan techniki” do.

Further suggestions as to technical character of the patented subject matter can be inferred from the regulation relating to the format of the specification. The description of the invention has to be in the technical field (art. 33(1) IPL, rule 27 (1) EPC). The claims need to show technical features of the invention.

Finally, when deciding unity of the invention one has to look at the corresponding technical features which are decisive to the contribution to the prior art (sec. 34 (2) IPL, rule 30 (1) EPC).

The problem of technical character has also been reflected in the major harmonization instrument on the world wide scale – in the TRIPS agreement. Art. 27 (1) of TRIPS requires that inventions be granted for all inventions, products and processes from in all technical fields.

This requirement has now been reflected in the amendment to IPL which went into force on 18 October 2002. This amendment extends the definition of the patentable invention in section 24 of IPL, which now reads:

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<sup>1</sup> See: S. Grzybowski, *Prawo wynalazcze*, 1965, p. 21, S. So\_tysi\_ski, in: *System prawa w\_asno\_ci intelektualnej*, red. J. Szwaja, Tom III *Prawo wynalazcze*, 1990, pp. 29-32 and references quoted therein

*Patents shall be granted for inventions which are new, possess inventive step and are industrially applicable **without regard to the technical field.***

Similarly the revision of the EPC has also supplemented the definition of the patentable invention as being from any field of technology. The amended provision will not go into force immediately, however the explanatory notes to the proposal for amendment emphasized that this provision is self-evident and already reflected in the practice of the EPO

Last but not least we should mention the planned changes to the law and proposed new legislative developments.

In the framework of the revision of EPC one of the proposed changes was to delete the exemplary list of non-inventions from art. 52 (2) of the EPC and possibly introduce them as administrative rules. The art. 52 would in turn be supplemented by a requirement for technical character. This proposal changed a number of times prior to the Diplomatic Conference and the final proposal contained only deletion of computer programs from the list. At the conference it was finally resolved that the issue of computer programs will be moved to the second basket. The closing statement of the conference emphasized very strongly that lack of changes in this regard is not to influence in any way the current practice of the EPO and its Board of Appeals.

Finally we come to the proposal for a directive on the patentability of computer programs<sup>2</sup>. This text makes quite a number of references to the requirement of technical character.

- (1) Recital 10: *In order for an invention to be considered as patentable it should have a **technical character** and thus belong to the field of **technology***”
- (2) Recital 11: *Although computer-implemented inventions are considered to belong to a field of technology, in order to involve an inventive step, in common with inventions in general, they should make **a technical contribution** to the state of the art.*
- (3) Recital 12: *Accordingly, where an invention does not make a technical contribution to the state of the art, as would be the case, for example, where its **specific contribution lacks a technical character**, the invention will lack an inventive step and thus will not be patentable.*

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<sup>2</sup> Brussels, 20.02.2002 COM(2002) 92 final 2002/0047 (COD) Proposal for a directive of the European parliament and of the council on the patentability of computer-implemented inventions

- (4) Recital 13: (...) *an algorithm which is defined without reference to a physical environment is inherently non-technical and cannot therefore constitute a patentable invention.*
- (5) Art. 2 (b) defines technical contribution as: *a contribution to the state of the art in a technical field which is not obvious to a person skilled in the art.*
- (6) According to Art. 3 computer-implemented inventions belong to a field of technology.
- (7) Art. 4 (2) states that the requirement of technical contribution is a part of the requirement for inventive step.
- (8) According to art. 4 (3): *The technical contribution shall be assessed by consideration of the difference between the scope of the patent claim considered as a whole, elements of which may comprise both technical and non-technical features, and the state of the art.*

It is apparent that the technical character requirement is a fundamental element on which the European legislator wants to define the patentability rules with respect to computer implemented inventions. It is further interesting that the opponents of the patentability of computer programs are also relying very heavily on the requirement of technical character<sup>3</sup>.

Although not the subject of analysis at this time we can briefly summarise the approach of other major patent jurisdictions. In the US the requirement of technical character with respect to patentable invention has never become an important issue. One may however see certain parallels between the discussion regarding patentability of algorithms and the current controversy in Europe. The Japanese Patent Office seems to take a similar approach to the EPO.

We can therefore safely conclude that under the current EU and Polish law the concept of technical character may be a very useful analytical tool for separating the patentable subject matter from developments where the patent protection is not applicable.

## **2. What is technical character?**

### 2.1 Technical character in common language

The origin of the word “technique” and “technical” is in ancient Greek. The word “tekhne” means “art” or “skill”. This meaning is very much present in the current usage of the word.

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<sup>3</sup> See eg. the web-site of Eurolinux: <http://www.eurolinux.org> [last viewed: 18 October 2002]

We talk about technique of a painter, musician or football player. We can also describe the practice of making laws as being technical once certain policy decisions have been reached. It therefore seems that the common language meaning of the word technical is not specifically useful and it seems that the legislator intended the word to have a special meaning in this particular context.

## 2.2. Technical character – examples of EPO case-law

The European Patent Office has not attempted to provide a general definition of technology or of an invention. It has thought hinted at various aspects of what constitutes technical character.

2.2.1 Technical means leading to a technical effect. In the Vicom decision the Board of Appeals at the EPO said: *“If a mathematical method is used in a technical process, that process is carried out on a physical entity (which may be a material object but equally an image stored as an electric signal) by some technical means implementing the method”* This would imply that for an invention to be technical it needs to use technical means producing a technical result. The decision doesn't seem to contain any suggestion as to what distinguishes technical means from non-technical means or what is the required characteristic of a technical result. In a further decision in the case of Sterzel/X-ray apparatus the Board stated that a mix of technical and non-technical means has an overall technical character.

2.2.2. When is the effect technical? Following these initial cases the Board subsequently tried to distinguish on a case-by-case basis when the effect that the use of certain means can be regarded as technical. As an example the following four cases can be quoted. They fall on different side of the line between the technical and non-technical.

In IBM/Data processor network the method of communicating between programs and data files within a computer, so that they operate as one, was regarded as “essentially technical”. In IBM/Displaying of pre-determined messages the invention concerned displaying system events to the user of a text processing system. System events include events like having no disk in the disk drive when one was required. The domains involved were the user and the computer on which the text processing program is run; the inputs were from the computer hardware and the outputs were given to the user. The use of a certain data structure and an algorithm for handling it made the program function faster and use less storage than prior art.

The invention was said to solve a technical problem, without much comment as to the reasons for such an assertion.

In IBM/Document abstracting and retrieval the invention was to automatically form an abstract of a document not by erasing from a documents words which were contained in a saved list of trivial words. The remaining non-trivial words were accepted as key-words in the document and thus an abstract was formed. The Board stated that the problem to be solved and thus the effect was not technical as it pertained to identifying and noting information. Therefore although technical means were employed there was no technical effect and no technical character. In IBM/Text processing the invention involved identification and replacement of expression over a certain level of understandability. The operation was performed by an operator but the invention pertained to certain technical means, as a pre-stored vocabulary, a user interface, and a processing means searching the text. The application was refused as lacking technical character and pertaining to semantic relationship rather than a technical field.

2.2.3. Technical considerations. In Sohei/General purpose management system the invention concerned a system that combined various types of management (eg. financial and inventory). The innovation was in the usefulness of the user interface. The Board did not consider the nature of the functionality performed by the program and held that: “(...) to perform the aforementioned five functions would clearly require technical considerations (...)”. The decision seems inconsistent with the two refused IBM applications just described. The Board decided that it is not necessary to analyse the functionality of the program in a way similar to the previous cases.

2.2.4. Computer program product is technical. Finally in two recent IBM/Computer program product cases the Board stated that a claim directed to a computer program product of a certain functionality may define a technical invention, if it produces a technical effect. The current text proposal for a EU Directive seems not to endorse this point of view.

### 2.3. The EU Directive proposal - technical contribution.

We now may move to the analysis of the concept of technical contribution. It seems that in the present text of the directive the requirement for technical contribution is central in sorting the technical from non-technical subject matter. The directive makes it clear that the test for technical contribution is part of the test for inventive step. The examiner when assessing

inventive step should assume all the novel features lying in a field which is deemed non-technical as known. Then she should make a comparison of all the features in thus defined prior art with the invention. If in these circumstances there is an inventive step (evaluated in a standard way) a patent may be granted.

It is very easy to see that this definition does not give much information as to what is technical. The question remains which field is technical and therefore a contribution in this field is deemed as such. In art. 3 of the directive it is indicated that a computer-implemented invention is a field of technology. In art. 5 the claims to “computer program product” or “digital data carrier with a program recorded thereon” are not included in the catalogue of possible claim formats.

#### 2.4. Synthetic definitions of technical character

The problem of technical character has been present in the analyses of legal scholars for a very long time. In Polish law the requirement was described as: “*the solution needs to pertain to a construction, a device, a method of production or a process which is set to achieve a certain technical result*”<sup>4</sup>. Seems to shift of the problem onto the problem of technical result or to speak in terms of the EPO case-law “technical effect”.

Various authors agreed that the key element in defining technical character is defining scope of the word technology (technique) which was often defined as: “*all the known methods of affecting matter designed to satisfy individual and common human needs*”<sup>5</sup>.

The German Supreme Court has quite consistently described a technical invention as “*a teaching for systematic action using controllable natural forces to achieve a result with clear cause and effect*”<sup>6</sup>. This definition has been applied in a number of cases by the BGH, BPatG and the German Patent Office.

The definition requires that there be a systematic action with an achievable result and a cause and effect. These elements of the definition seem to be reflected in other requirements of the patent law. The repeatability of the invention and the understanding of its mechanism are required for adequate disclosure and also to fulfill the industrial applicability requirement.

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<sup>4</sup> S. Grzybowski, Prawo wynalazcze [Law on inventions], 1965 p. 21

<sup>5</sup> S. So\_tysinski, Prawo wynalazcze. Komentarz [Law on inventions. Commentary], Warszawa 1975

<sup>6</sup> See „Rote Taube”, IIC 1/1970, p.136, “Logikverifikation” CR 360 2000

Secondly there need to be natural forces used and they need to be controllable. In the Polish definition the equivalent may be the need to affect matter.

Thus for example a teaching which leaves to the operator a certain decision based on her skills, prior experience or intuition will not be patentable (e.g. the decision made by the breeder in the Red Dove case). Such a teaching would suggest that the forces used are not controllable; we cannot describe the decision-making process with clear rules but need to resort to certain elements of the mind beyond our direct control and understanding.

The scope of what is controllable is expanding with the advance of various sciences. Many processes which required human intervention based on experience or skill have now been made automatic and may be defined as an algorithm. They have thus become technical in the above-described sense. This seems to include processing of information and data. To the extent that they can be controlled there is no reason why they shouldn't be treated as a physical variable. Indeed the modern physics confirms the view that information is physical and that manipulation of data is a physical process.

The recently released paper prepared by the German Patent Office draws a comparison between the BGH definition of a technical invention and the Turing Principle according to which any problem can be solved by machine if it can be described as an algorithm. The Turing machine was in fact a theoretical prototype of a modern general purpose computer. It is capable of solving all the problems that computers are capable of solving.

## 2.5. Functional features in claims – Polish Patent Office practice

The “Red Dove” definition of technology may therefore be seen as concerned with functions performed by a machine. This is reflected correspondingly in the infringement side of the problem. It is possible that an invention which was initially thought of as realised by electronical or even mechanical means, may equally well be fulfilled with a computer programmed having elements programmed to perform specific functions defined in the claims. From a theoretical point of view any inventions any invention that is defined by functional features may be realised by software. This follows directly from the Turing principle.

The old practice of the Polish Patent Office and of the German Patent Office was to refuse any language defining the elements of an invention by the function that these elements

perform. This was said to be either a feature of the invention in the method category or not a solution to a problem but merely statement as to what the problem was. The appropriate language was referred to as “structural”, i.e. showing elements, their relative positioning and linking and their structure.

This practice has long been abandoned by the German Patent Office. In the Polish Patent Office it is still present to a certain extent. It however seems that there is no difference between the functional and structural language. Many times the changes that need to be made are of purely linguistic nature. An invention in the apparatus category containing an electric engine as the characteristic feature seems a structural description. It would be probably accepted, as opposed to “means for changing an electric current into a circular movement”. In practice of the Polish Patent Office there is a number of much more sophisticated linguistic alterations that provide effectively for a synonym of the functional description, however not containing the “means for” language. PPO has issued a huge number of patents which contain functional language similar to the above or even much more straightforward.

The following examples are taken from the patents granted in the 80s and early 90s.

- PL 123820 (published 25 September 1984): „Computer interface comprising (...), characterised in that, it contains in every reservation system a commuting element which allows for communication of each priority application bus with a system for refreshing the application bus of the device, whereby in each particular moment the commuting systems connect with a single application bus (...)”.

- PL 116 724 (published 31 March 1983): „1. Method of executing a set of commands for data processing (...), characterised in that the time of executing the commands of the first type and the first period of time of executing the commands of the second type is placed each time in a corresponding read faze, and further the second and third period of time of the time of executing the commands of the second type is placed in the read phase corresponding to the next command”, 2. System for executing commands for data transfer in a computer (...), characterised in that it contains in each functional element at least one register of data memory containing data transferred by a set of buses, two adress decoders and one command decoder deciding which of the adressed functional elements is to perform which function defined by the command, first movable register designed to connect the bus system with the output of the data memory register and at least one second movable register for connecting the set of busses with the input of the data memory register”.

- PL 116 378 (published 30 May 1983): Data processing system (...), characterised in that each memory element has a terminal, and the electrical properties of said terminal allow for displaying access time for this memory element, and a clock element containing logical circuitry is connected with the terminals of the memory elements for setting the frequency of the clock element to a value corresponding with the access time of the slowest memory element.”
- PL 165457 (published 3 April 1991): „A system for eliminating dependency of the data processed in a computer, in particular in a computer having an architecture allowing for serial execution of a sequence of scalar operations, containing an arithmetic logic unit, characterised in that it contains a command register with at least two memory tables, at least three universal register, each for a single argument of the operation, a switching mans, which is connected to a common output of the universal registers, logic unit for decoding and controlling, the input of which is connected to the output of the command register (...)”
- PL 153 248 (published 30 September 1991): „A protected data mameory in a microprocessor system, characterised in that it contains a unit admitting information to be written, generating an impuls signal allowing to write after receiving from the microprocessor the sequence of signalls corresponding to the programmed password, proceeding the actual write operation (...)”
- PL 146 286 (published 30 June 1989): „A digital device for drawing curves and parts thereof, described by equations of  $P(x)+Q(y)=0$  (...), characterised in that it contains three functional units (...) coordinants unit and two units generating subsequent element of a sequence characteristic to the curve being drawn (...)”
- PL 165 903 (published 22 May 1991): „A device for generating windows on a computer screen of a dependant working terminal in which several dependent terminals are connected by a control device to a central processor, characterised in that the monitor of the dependent terminal is connected via a control device to a central processor forming an electric signal containing the parameters of the window generated on the monitor screen and the display means are connected to the control device.”
- PL 109 471 (published 30 June 1981): „A digital system for calculating square root of a figure or a sum of two figures in binary form, characterised in that it contains, a parallel registry unit storing each time the rooted figure (...), a reducing unit, (...) a conversion unit storing these bits (...)

It may therefore be stated that the practice of the Polish Patent Office is to accept functional claims where they are the only language that can lead to adequate protection of the invention.

The inventions described in the above-referenced patent specifications can all be realised by appropriate software on a general purpose computer or by an appropriate circuitry.

In its more recent history the PPO has granted the following patents where clearly the computer implemented embodiment is the preferred mode of realising the invention<sup>7</sup>.

PL170083, Method of data processing in a multimedia device and a multimedia device.

PL170449, Method and apparatus for issuing a cumulated discount certificate in a point of sale.

PL 179381, Method and system for distributing electronic money

PL 182138, Method and system for exchanging information between units of a electronic monetary system

The PPO has even granted a few patents where the claims explicitly cover a computer program product:

PL 180619, Method, device and computer program product for communication in a client/server system.

PL 180619, Method, device and computer program product for TCP communication.

Simultaneously there are a few decisions by both the PPO and its Board of Appeals where the applications have been refused. These decisions are largely based on the specific exclusions included in the Law on inventions<sup>8</sup>. The decisions state also that because the claims in the apparatus category contained only functional features for performing an algorithm they lack technical means and may not be granted protection.

### **3. Conclusion**

3.1 The technical character requirement does not seem to be a particularly clearly defined legal term.

3.2 Numerous attempts at defining are circular and define technical character as possessing technical features, which in turn are defined as features pertaining to a specific field of technology, etc.

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<sup>7</sup> See, J.J. W\_odek, Wynalazki wykorzystuj\_ace programy komputerowe, Rzecznik patentowy 2(33)/2002 p. 39

<sup>8</sup> See eg. Odw. 1713/95 dated 15 March 1996 and Odw. 1783/95 dated 25 March 1996

3.3. The application of the technical character test has been unclear and not very predictable. The statements in decisions and the practice of granting patents are contradictory in numerous cases.

3.4. The concept of technical contribution defined in the current proposal for the EU Directive raises similar doubts as to the certainty of its application and its utility for separating technical from non technical.

3.5. The most workable definition seems to be the one developed by the BGH starting with its Red Dove decision. This definition's main emphasis is in the requirement for controllable natural forces to be employed in the teaching. The definition implies that rules of organization, information processing or also rules of economics if they become controllable should be regarded as physical variables and thus as employing controllable natural forces.

3.6. Polish, German and European Patent Offices have been granting over the years numerous patents where the scope of protection included software embodiments. Any attempt at changing this would mean a very serious revolution in the patent system.

3.7. The usefulness of the concept of technical invention and in particular of its various definitions is therefore doubtful.