



Patent Protection for Software and Business Methods in the United States

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1. Introduction

Patent protection for computer programs is a relatively new issue in US law. Developers previously relied on confidential information and contract law to protect their interests.

In the USA, the situation as to possible patent protection for certain methods - including business methods or algorithms - is different from Europe since US patent law does not include any restriction on certain subject matter, whereas the European Patent Convention contains an exception for computer programs (as well as schemes, rules and methods for performing mental acts doing business, among others) as such. The scope of patentable subject matter is not restricted in the USA. Indeed, patentability requires, in general, showing that the subject matter is useful. This allows for the incorporation of computer software into the US patent system. However, the scope of protection granted and the requirements which have to be met are still subject to discussion.

Under U.S. patent law, patents may be granted for any new and useful process, product, manufacture or composition of matter. This broad scope of patentable subject matter has enabled the US to widen the ambit of general patent law so as to include certain types of useful methods, which in turn include computer programs.

Previously inventions for which patent protection was denied included claimed algorithms and methods of doing business.

Although both classes of subject matter can be treated differently, both computer programs and business methods are similar in that they can be implemented by use of a computer. Both systems are also essentially methods for solving problems, and are therefore treated together here.

2. General Requirements for Patentability

For patentability in Europe, the law requires that there is an invention, and that it is new, inventive and Industrially applicable. The requirement of an invention is apparently derived from the "method of manufacture" requirement of the Statute of Monopolies. In Europe this requirement is generally interpreted to mean that an invention must have a technical character or, in other words, must make a technical contribution to the art. Thus if a patent application merely relates to a discovery, scientific theory or mathematical method or rules and methods for performing mental acts or doing business, or to computer programs as such, a patent will not issue.

In the USA, by way of contrast, an invention must fall into one of five "statutory classes" of things to be patentable: these are: processes, machines, manufactures (that is, objects made by humans or machines), compositions of matter, and new uses of any of the above.

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As in the case of Europe, in the USA inventions have to be new in the sense that they must not form part of the state of the art any where in the world. Thus the European Patent Convention (Art. 54,1 and 2) provides that

"An invention shall be considered 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 everything made available to the public by means of a written or oral description, by use or in any other way, before the date of filing the patent application."

The US Patent Law (35 U.S.C. § 102) provides for national novelty:

"A person shall be entitled to a patent unless - the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent."

The second requirement of patentability is that a technological innovation must involve an inventive step, in the sense of an act of creation which is not obvious to a person skilled in the relevant art. In other words, there is no difference in meaning between obviousness and lack of an inventive step.

An inventive step may involve the solution to a long-standing problem or the satisfaction of a long-felt need. Simplicity of invention is said to be no objection to patentability. Invention may lie in the conception, even where the method of carrying it out is obvious. Alternatively, the invention might lie in conceiving new methods for carrying an existing idea into practice. Or it might lie in a combination of the two. It is said that it is not inventive to apply a well-known mechanism or technique for an analogous purpose, but it will be inventive if a new use involves the utilisation of a hitherto unknown property of a known substance or mechanism.

The relevant knowledge against which obviousness is tested is that of the hypothetically skilled craftsman in the state of knowledge in the particular art existing at the priority date of the patent. Often a difficult question is the extent of diligence of the craftsman in seeking out knowledge. Some courts refer to the knowledge of a diligent researcher, while others focus upon the knowledge of a non-inventive, skilled worker.

The final requirement for patentability both in Europe and the USA is that an invention must be useful, in the sense of industrially applicable. This requirement is necessary to prevent the patent system from applying to scientific information for which a practical application has not yet been ascertained.

3. Business Methods and Computer Program Inventions

In the USA, the possibility to patent computer programmes and business methods arises from judicial interpretation that s.101 of the Patents Act includes "anything under the sun that is made by man"¹.

However, this excludes laws of nature, physical phenomena, and abstract ideas. These are deemed discoveries and as such manifestations of nature which belong to the public domain.

The exclusion of such subject matter is, therefore, subject to the so-called **mental steps** doctrine. Although a computer program contains a method for solving problems and thus presents nothing more than a series of instructions to a machine, the scope of the mental steps doctrine has now already been by-passed.

Hence, courts began to consider the patentability of computer programs and ruled that an invention relating to firmware or to a computer controlled process for manufacturing rubber were patentable. The court distinguished between the mathematical formula and its application in controlling a process. The test was to look at the invention as a whole and not just at the novel features. Thus, a computer controlled process is patentable, although the process as such may reflect prior art, provided that the non-obviousness requirement is fulfilled.

However, the case law then started to move into a more generous direction which culminated in the question whether algorithms are patentable as such. The test was defined as follows. First, whether a mathematical algorithm is directly or indirectly recited in the claim. If yes, whether the claimed invention as a whole is more than the algorithm itself. This raises the question of whether the claim is directed solely to a mathematical algorithm, or whether it is applied to an industrial application or limited by physical elements. The lack of a mathematical formula in the specification does not of guarantee patentability Hence, the US Patent Office granted patents relating to the mathematical analysis of electrocardiographic signals, to the conversion of seismic signals, to a navigation system, to computerized systems for: for calculating the width of certain fractures; and for processing and supervising a portfolio of bank accounts.

On the other hand, a method for graphics interpolation was held not to be patentable since when the algorithm was taken out of consideration, the residue was merely a display of the results. The court held that "such post-solution activity does not convert claimed subject matter into" something embraced b. s.101.

A further wave of case law then emerged during the 1990s. the case of *In re Donaldson* gave the opportunity to refine the necessary test. Hence, it was asserted that if what was being claimed was effectively a machine, this would fulfill the patentability requirements if the method claimed had some physical embodiment. As to the general issue of algorithms included, it was decided that the "mathematical algorithm" exception to patentability is to be interpreted very narrowly since Congress had intended that "anything under the sun that is made by man" should be patentable. Limitation to patentability were thus restricted to claims directed to laws of nature, natural phenomena and abstract ideas only. This means that mathematical algorithms are patentable subject matter unless they represent a mere abstract idea or a disembodied mathematical concept, i.e. if they are applied in a certain fashion. If the concept was embedded in a machine which enables it to produce a useful and tangible result, the algorithm is thus patentable. This is so even if the claimed concept consists of a series of mathematical calculations.

Additionally, it was found irrelevant that a computer program claimed represents a general purpose claim. It was sufficient that the function of that program was to produce a special purpose in relation to a particular machine. In addition, it was also held that, for the purpose of being tangible, the embodiment of a computer program in a physical carrier was sufficient. (See p. 4)

Effectively, this opens a pathway to the patentability of all other concepts underlying certain methods, including all forms of computer programs, and was met with fierce criticism.

The patentability of software-related inventions is not, however, confined to the algorithm/business method area.

3.1. Business Methods

a) The patentability of business methods in the practice

Probably the most significant US decision in the field of patents over the past ten years was the US Federal Circuit Court of Appeal's decision in *State Street Bank and Trust Co v Signature Financial Group, Inc.* (149 F.3d 1368) (1998) which approved the patentability

both of computer software and business methods. The invention in that case was a data processing system, operating through a computer, to assist in the administration of invested funds. The court ruled that a mathematical algorithm was patentable provided it produced "a useful, concrete and tangible result" The claims were directed to "a data processing system for managing a financial services configuration of a portfolio established as a partnership, each partner being one of a plurality of funds" comprising a number of different "means for processing data". The result would allow the allocation of financial information to specific customers, i.e. gains and losses etc and thus to calculate the final share price. It was asserted that, since the claim was written in a means plus function form (i.e. relating to a method for a specific purpose) it was related to a machine (i.e. a computer). It was therefore not unpatentable as such. The main question then was whether the claim related to an abstract concept. The court held again that mathematical algorithms were unpatentable as they were concepts disembodied from a useful purpose. Business methods had previously been excepted from patentability by the USPTO, but following the State Street Bank case it amended its examination guidelines to provide that claims to business methods are to be treated like any other process claims.

Thus the transformation of data was considered patentable because it was considered to be a practical application of a mathematical algorithm. Similarly, share prices produced by a series of computerized computations was deemed to be useful and thus patentable.

In essence, the patentability of methods now simply requires that such method - whether it is a concept as such or a concept embodied in a computer program - produces something useful and tangible. Effectively, this means that claims entailing any such result are registrable despite the fact that it concerns methods - in the form of either a business method or a computer program - as such.

b) The First Inventor Defense

In 1999, the US patent law was amended so as to include the so called first inventor or prior use defence. The defence applies only to actions for infringements of claims infringed by "any method of doing or conducting an entity's business". This was a response to the breadth of the State Street decision. The defence is not limited, however, to the situation in State Street (i.e. the financial services sector), but is deemed to apply to any industry relying on trade secrets for methods of doing business. In essence, if a claim involving such method is patented, the patentee is deprived of his right to attack business rivals if these had used such method at least one year before the filing date. This protects two activities. First, where the defendant had been in good faith before the effective filing date. Second, in cases concerning certain non-profit organizations such as universities, research centers or those carrying out work for the public benefit. The defence has no absolute effect (i.e. has consequences only as between claimant and defendant) and does not cause the patent to be invalidated. Persons acquiring, by way of assignment, a "useful end product" containing the patented method acquire the defenses likewise.

3.2. Computer Software

a) The patentability of computer software in the practice

The United States Patent and Trademark Office now makes it clear that claims involving business methods and computer programs embodied in a tangible form are no longer being rejected. These claims must, as do all other patents, be examined according to novelty and non-obviousness.

Subject Matter Test

The PTO Guidelines now require determination as to whether the invention is useful, i.e. whether it is valuable in the real world rather than being a mere idea or concept. Business methods, thus, are to be treated in the same way as other process patent claims.

Excluded Subject Matter

The next step then is to decide whether the claim relates to one of the categories, i.e. machines (including a programmed computer which carries out certain tasks), article of manufacture and processes. This is done by - negatively - excluding - certain subject matter. The Guidelines provide for the patentability of: data structures or programs mediated by a computer programme and data compilations or arrangements of non-functional information.

b) Patentability as Machine or Process Patent

Patent Protection as Machine and Manufacture Claim: To be patentable the claim must refer to the physical attributes of the computer programme. Thus a computer program, can be defined as a "logic circuit formed when a programmed computer performs a specified function, or a memory defined by particularized functional or structural characteristics, or a memory structurally represented by storing a computer-mediated program code. Otherwise, the program will only be patentable as a process, subject to the process patent test.

Patentable Processes: A process claim concern the manipulation of energy which produces a physical transformation. The manipulated object can be an intangible representation of physical activity or objects. This definition includes a claim by which external objects are manipulated as well as the way in the computer works (for example, the effect on an operating system or the effect on further programs). In addition, if "the process causes a transformation of the physical but intangible representation of the physical object or activities" processes merely representing a computation or a manipulation of abstract ideas are still excluded under this requirement.

Alternative approaches to patenting for the protection of computer software, have involved the development of sui generis semiconductor legislation and the use of copyright law. The first piece of semiconductor legislation was the Semiconductor Chip Protection Act 1984, which protects the layout or three dimensional architecture of integrated circuits within which computer programmes are embedded. In the US, software developers have been permitted to copyright the codes of their programs. Protection is afforded to both source code and object code under the general assumption that computer software constitutes a literary work.

4. Conclusion

It is much easier to gain patent protection for computer software in the United States than it appears to be the case in the European Union. In the USA, the more fundamental approach to patenting - the general "everything under the sun" - enables courts to widely grant protection without any restriction even to the technical character of the subject matter at hand. The gravest consequence lies in a possible overprotection and thus monopolisation of informational items since the claim may well encompass not only the series of information embedded but also the concept which it carries out.

1. The US Supreme Court uttered these now-famous words in *Diamond v. Chakrabarty* (1980)