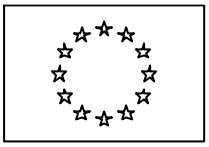

COMMISSION OF THE EUROPEAN COMMUNITIES

DG Internal Market

Brussels, 19.10.2000

THE PATENTABILITY OF COMPUTER-IMPLEMENTED INVENTIONS

Consultation Paper by the Services of the Directorate General for the Internal Market

1. The purpose of this document

Following the Commission's Green Paper on the Community Patent and the patent system in Europe and the subsequent Communication[1], considerable debate has taken place in Europe[2] about the patentability of computer-implemented inventions[3]. Some consider that patents in this field tend to stifle fair competition and hinder innovation. Others believe that patents will on the contrary stimulate innovation in this sector by encouraging investment.

The current legal situation regarding patent protection for computer-implemented inventions is unsatisfactory by virtue of lacking clarity and legal certainty. Computer programs "as such" are excluded from patentability by the provisions of Art. 52(2) and (3) of the European Patent Convention (EPC)[4] which are in essence reproduced in Member States' patent laws. Yet, thousands of patents for technical inventions using a computer program have been granted by national patent offices and by the European Patent Office (EPO). Furthermore, while the national and EPO provisions setting out the conditions for granting such patents are similar, their application in the case law and the administrative practices of the patent offices varies considerably. This situation has adversely affected investment and innovation in the software sector and has also had a negative impact on the functioning of the Internal Market.

Harmonisation of national patent laws on the issue is necessary. This should provide greater transparency for European companies, especially for SMEs. It should also improve the competitive position of the European software industry in relation to its major trading partners. The need to improve the competitive situation is all the more urgent because of the increasing distribution and use of computer programs on a world-wide scale via the Internet.

In parallel with the preparation of a legislative initiative by the European Community, amendments to the European Patent Convention are currently under preparation. To this end, an intergovernmental conference is due to be held in Munich in November 2000. It is possible that this conference will decide to delete computer programs from the list of non-patentable items defined in the Convention. A majority of contracting states to the Convention seem prepared to support such a move. However, a number of Member States have expressed a preference for the Commission to come forward with an initiative in this field.

A further issue is that it is not immediately evident at what level harmonisation should take place. For example there are substantial differences between the legal requirements in Europe and in the United States. More specifically, in the U.S. patents for computer-implemented inventions are increasingly being granted for business methods, in particular for business methods with applications in electronic commerce[5].

In this situation, the Commission needs to strike the right balance between promoting innovation through the possibility of obtaining patents for computer-implemented inventions, and ensuring adequate competition in the market place. However, there are divergent views on how this should be achieved. Therefore, the Commission's Directorate General for the Internal Market, after having consulted the Commission's other most concerned services, considers it necessary that a further and wide consultation should take place with all interested parties, including in particular the Member States. The Commission will settle its policy on this important issue only after the end of this consultation.

In order to facilitate the consultation, a number of elements have been presented which are based on what one could consider to be the status quo on the patentability of computer-implemented inventions in Europe as defined by a cross-section of the case-law[6].

It should be stressed that this approach has been followed to allow a useful and structured consultation, and that this paper is a paper of the services of DG Internal Market and does not necessarily reflect the position of the Commission services on the matter. The Commission will only define its position after the end of the consultation.

The main questions on which the Commission's services seek comments from the Member States and the public at large through this consultation are the following:

a) Scope of harmonisation

- Should harmonisation take place on the basis of the elements contained in this document? Or:
- Should a more restrictive approach be adopted? Or, conversely:
- Should more liberal conditions coming closer to the practice in the United States of America prevail in the future?

b) Impact of harmonisation

What would be the impact of the preferred option on:

- innovation in software and underlying knowledge and techniques;
- the ability of SMEs to enter the market of innovative software tools and services and the market of innovative applications of software;
- the creation and dissemination of free/open source software;
- the position of the European software industry in global competition; and
- the general development of the Information Society.

2. Timing

This document is being submitted to the EU Member States as a basis for discussion. Moreover, it is available on the Commission's DG Internal Market website at http://europa.eu.int/comm/internal_market/en/intprop/indprop/index.htm .

In view of the increasing pressure for action, it is the intention of the Commission services to finalise the consultation process end of this year.

The consultation will include a meeting with Member States in December 2000.

The public at large and all interested circles may direct their comments to the Directorate General for the Internal Market, either **by mail to the following address: European Commission, DG Internal Market (MARKT/E/2), Rue de la Loi, 200 (C100 5/13), B - 1049 Brussels,** or **by e-mail to be directed to** MARKT-SOFTPAT@cec.eu.int **.** Any comments should be received on or before **15 December 2000**.

The Commission intends to define its final position on this issue early in 2001.

Possible key elements for a harmonised approach to the patentability of computer-implemented inventions in the European Community

i. The principle

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. In that context, a computer-implemented invention is considered to belong to a field of technology.

Comments:

This element reflects Article 27(1) of the TRIPS Agreement, according to which patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.

It assumes that a computer-implemented invention belongs to a field of technology because its purpose generally is to control the operation of a computer. In so doing, a computer program causes, when run on a computer, a technical effect. This technical effect may consist, for instance, in the control of an industrial process or the working of a piece of machinery by the computer (examples: a method of digitally processing images[7]; an X-ray apparatus incorporating a data processing unit to ensure optimum exposure with sufficient protection against overloading of the X-ray tube[8]). It may also be found in the internal functioning of the computer itself or its interfaces under the influence of the program (example: user interface for a business management system[9]). By controlling the operation of the computer, the computer program causes the computer to perform a task automatically without any intervening mental activity of a human being.

A finding of novelty does not require a technical contribution which will only be examined under the inventive step criterion. Novelty can be present even if the only contribution to the art is non-technical. In fact, practice has shown that examining technical contribution for novelty is fraught with difficulties.

The technical effect that a computer-implemented invention causes may already be known in the prior art[10]. The further requirement that the invention must make a technical contribution has to be assessed under the inventive step criterion. The fact that the technical contribution also has to be non-obvious is an important limitation of the patentability of computer-implemented inventions (see below, sub iii.).

A particular patent covers the particular use of the algorithm underlying a particular computer-implemented invention, in the way it is claimed for a particular purpose,

since it is an integral part of the invention. On the other hand, algorithms, which are not limited to a particular use, are inherently unpatentable.

However, computer programs "as such"[11], which can be considered to comprise the physical expression of the code (see infra sub ii) as well as mere abstract creations or mental concepts underlying a computer-implemented invention[12], are not patentable. They do not belong to a field of technology.

In processing patent applications for computer-implemented inventions, as in the case of inventions relating to any other field, the relevant patent based and non patent based prior art has to be identified. This requires a sufficient number of skilled examiners as well as appropriate databases and classification systems. As with any patent, it must also be ensured that there is a basis in the description for the subject matter of every claim and that the scope of the claims is not broader than is justified by the extent of the description and drawings and also the contribution to the art.

ii. The complementary nature of patent and copyright protection

Patent protection for a computer-implemented invention does not extend to the expression of a computer program based on that invention, in source code or object code or in any other form.

Comments:

A patent protects the ideas and principles as defined by the patent claims which determine the extent of the protection conferred by the patent[13]. Thus, a patent holder may prevent third parties from using programs based on these ideas and principles. Ways to create a large number of such programs might be found whose source or object code is different from each other and which might be protected in parallel by independent copyrights which would not mutually infringe each other.

On the other hand, for the purposes of Directive 91/250/EEC on the legal protection of computer programs[14], copyright protection is accorded to the particular expression in any form of a computer program, while ideas and principles which underlie any element of a computer program, including those which underlie its interfaces, are not protected. A computer program will be accorded copyright protection where the form of expression is original in the sense of being the author's own intellectual creation. In practice, this means that copyright would subsist in the expression in any form of the source code or the object code but would not subsist in the underlying ideas and principles of the source code or object code of a program. Copyright prohibits a substantial copy of the source code or object code but does not prevent the many possible alternate ways to express the same ideas and principles in different source or object code. It also does not protect against development of an identical or substantially identical program without the knowledge of an existing copyright.

Accordingly, legal protection may exist in respect of the same program both by patent and by copyright law. Their application should, however, be complementary and not have the effect of "double-banking" of protection.

iii. The requirement of a non-obvious technical contribution

A computer-implemented invention, to involve an inventive step, must make a technical contribution to the state of the art which, having regard to the state of the art, is not obvious to a person skilled in the art.

Comments:

(a) Technical contribution[15]

- *A technical contribution is the difference between the technical features of the invention as claimed and the technological state of the art. The assessment of this difference is made according to the general criteria applied in the Member States, for instance, by the problem – solution approach, according to which a patentable invention must provide a technical solution to a technical problem.*

- *A technical contribution can lie, for instance,*

  - *in the problem underlying, and solved by, the claimed invention*[16]*, or/and*

  - *in the means, that is the technical features, constituting the solution of the underlying problem*[17]*, or/and*

  - *in the effects achieved in the solution of the underlying problem*[18]*.*

- *The technical contribution may constitute an alternative solution for an already solved technical problem or for achieving a technical effect that is already known.*

(b) Obviousness

A computer-implemented invention which merely automates a known process using well known automation techniques will, in principle, be obvious and therefore cannot, in principle, be considered to involve an inventive step.

iv. The "technical considerations" criterion

A technical contribution may be implied, for instance, by the need for technical considerations to arrive at the computer implemented invention as claimed. The claimed invention must relate to the features resulting from those technical considerations.

Comments:

A need for technical considerations can be recognised, in particular, when knowledge of the hardware functions of the computer itself or of the functions of other hardware is required to arrive at the invention as claimed. The result of the technical considerations can be considered a technical contribution to the state of the art.

Recent developments in the case law have identified the "technical considerations" criterion as one suitable criterion for determining whether or not an invention makes a technical contribution (see, in particular, the EPO Board of Appeal in Sohei[19] *and the German Federal Court of Justice in* Logic Verification[20]*).*

By applying the "technical considerations" criterion, computer-implemented inventions are treated on equal footing with inventions in other areas, for instance those relating to the devising of a mechanical machine. To arrive at such inventions, technical considerations including a good knowledge of the components and of their functions are needed as well. Once the machine has been devised, the assembly of the components may only require the standard knowledge of a craftsperson, comparable to the knowledge required for mere programming in the computer field. Since it has never been disputed that the result of devising a mechanical machine can amount to a technical contribution, the same should apply in the case of the devising of a computer-based solution for a technical problem. It should however be repeated that a finding of a technical contribution resulting from the need for technical considerations for the invention as claimed is not enough. It will still be necessary to assess whether the technical contribution is obvious or not to a person skilled in the art.

v. The assessment of technical and non-technical features – consequences for business methods

In determining the technical contribution, the invention must be assessed as a whole. It may consist of a mix of technical and non-technical features but in determining the technical contribution only the technical features are taken into account. Where the contribution lies merely in non-technical features, the invention will not be considered as involving an inventive step.

Comments:

A computer-implemented invention that makes a technical contribution will, in principle, be patentable even if its application concerns one of the other non-technical fields mentioned in the provisions of Member States' patent laws corresponding to Art. 52(2) of the EPC, e.g., methods for doing business, mental acts, presentations of information, aesthetic creations, or methods for playing games. The presence of such non-technical features will not preclude a finding of a technical contribution.

General examples of a technical contribution which may be of particular importance for a computer-implemented inventions with a specific application in a non-technical field, such as business, are enhanced processing speed, more economical use of memory, an improved user interface, or an improvement of the way in which an internal computer command signal is generated.

The foregoing approach according to which the field of application of a computer-implemented invention is irrelevant should be seen, in particular, in the light of the changes brought about by today's Information Society where economic growth is based on innovation, information and knowledge beyond the mechanical arts and applied sciences.

However, where the only contribution is non-technical, that is where it merely lies in one of the other fields excluded under the provisions of Member States' patent laws corresponding to Art. 52(2) of the EPC, e.g. in the business field, the computer-implemented invention will not be considered as involving an inventive step and, thus, will not be patentable.

Where a patent for a computer-implemented invention has been granted because a technical contribution has been found and where the invention comprises a non-technical feature, e.g. a commercial one (i.e. the invention has a business application), this commercial feature (business application) should not legally be monopolised by the patent. The presence of non-technical features in a patented computer-implemented invention should not prevent the grant of a patent for a different computer-implemented invention comprising the same non-technical features because these features will not be taken into account in determining the technical contribution which the latter invention makes. Furthermore, while the scope of protection of a patent is determined by all the features of the claims (interpreted in the light of the description and the drawings relating to the invention), the holder of a patent for an invention consisting of technical and non-technical features should also not be in a position to successfully allege patent infringement against a third party who uses only the non-technical features.

In other words, a patent for a computer-implemented invention with an application in a non-technical field such as the business field can only be granted if the invention makes a technical contribution and not merely a contribution in the business field. For instance, a computer-backed order tracking process using radio communication for use in a restaurant can be patented if the process is novel and makes a technical contribution, which may lie, e.g., in the speed of the transmission of orders.

The approach set out above should prevent, in particular, monopolies for business methods, including those used in electronic commerce, arising from patents with business applications in Europe.

Considerations analogous to those regarding the business field apply with respect to features in other non-technical fields, such as those mentioned in the provisions of national patent laws corresponding to Art. 52(2) of the EPC, for instance to mental acts, presentations of information, aesthetic creations, or methods for playing games.

vi. The possible claims

A computer-implemented invention may be claimed as a product, namely as the programmed computer, or as a process, namely as the process carried out by the programmed computer.

Comments:

It is generally accepted that computer-implemented inventions may be claimed as an apparatus or a system (concerning the programmed computer) and/or a method (i.e. the process carried out by the programmed computer)[21].

vii. General patent law as continuous essential basis for protection

Beyond of what would be provided for in any Directive, the procedural and substantive legal rules of European patent laws would remain the essential basis for the legal protection of computer-implemented inventions.

Comments:

The issue of interoperability, in particular, appears to be sufficiently dealt with by general patent law. In fact, the requirement to adequately disclose the computer-implemented invention in the patent application and the experimental use exception should enable a person skilled in the art to adapt a program to another, pre-existing program created on the basis of the patented invention. To adapt the program, the person must, in accordance with general patent law, secure a license from the patent holder. The situation that a license needs to be obtained to get access to one or several patent rights is common in complex industries, and ways have been found by the business community to use licensing and cross-licensing in order to satisfy the needs. Market forces have in general provided for an adequately working system. The foregoing considerations also apply when the software with which interoperability is sought to achieve has developed into a standard. If the patent holder does not want to grant a license, compulsory licensing and competition law may force him/her to do so. And competition law can also be used to put curbs on abusive license conditions.

ANNEX I

Studies and consultations on the patentability of computer-implemented inventions by the Commission and others

The need for a Commission initiative in this field has been identified in a consultation process which the Commission started in 1997.

In response to the Commission's Green Paper on the Community Patent and the patent system in Europe[22] the European Parliament[23] and the Economic and Social Committee[24] both supported the patentability of computer programs.

Moreover, the interested circles had strongly urged legislative action in conferences organised by the Luxembourg and U.K. Presidencies in co-operation with the Commission. These conferences were held in Luxembourg on 25-26 November 1997[25] and in London on 23 March 1998[26].

In a follow-up communication to the Green Paper[27], the Commission took stock of the consultation process and stated that the patentability of computer programs was one of the priority issues identified during this process on which the Commission should rapidly submit a proposal. Organisations representing European businesses, namely UNICE[28] and EICTA[29], continued to ask the Commission to take a legislative initiative on the issue. UNICE, for instance, in February and September 2000, renewed its call for swift action to remove ambiguity and legal uncertainty which surrounds the patentability of software-related inventions. If rapid action were not undertaken, the respective market segment would be dominated by Europe's main trading partners, in particular Japan and the U.S., where there were no restrictions on patenting software-related inventions.

The services of the Commission also organised a meeting with representatives of the open source community, namely a delegation of EuroLinux representatives, on 15 October 1999 in Brussels[30]. On 18 November 1999, the Committee of the Regions gave its opinion on the issue[31]. Both EuroLinux and the Committee have expressed concerns that software patents might impede the progress of innovation in the software field.

Finally, the Commission launched an independent study on the scope of harmonisation[32] in the light of the recent developments in the United States. While the consultation on the Green Paper had clearly shown the need to harmonise and clarify the current legal situation, the purpose of the study on the economic impact of the patentability of computer-implemented inventions was to provide assistance in determining how extensive harmonisation should be. For this purpose, the study should assess the main consequences for innovation and competition, in particular for SMEs, of extending patent protection beyond current levels.

The findings of this and of other pertinent economic studies[33] suggest that the impact of patents for computer-implemented inventions on the economy is ambiguous. Nor in the public debate has any consensus emerged with respect to the question of whether patents for computer-implemented inventions will enhance economic growth or stifle it and the effects on Europe's position in the global economic marketplace.

ANNEX II

Overview of the current legal situation in Europe[34]

Under Art. 52(2) and (3) of the EPC which are reproduced in essence in Member States' patent laws, computer programs "as such" are defined as not being inventions and are thus excluded from patentability. Patents can only be granted for inventions which must also be new, involve an inventive step and be capable of industrial application. Based on these statutory requirements, Member States' courts and the Boards of Appeal of the EPO have held that a technical invention which uses a computer program is, in principle, patentable. In fact, it follows from the European legal tradition and in particular from the legal history of the EPC that, under Art. 52(1) of the EPC and the corresponding provisions of the patent laws of the Member States, patents can only be granted for inventions which have a technical character. Technical character can be interpreted as requiring, first, that an invention must belong to a field of technology and that, second, the invention must also make a *technical contribution* to the technological state of the art. Conversely, the exclusion of computer programs "as such" from patentability has been interpreted by the Boards of Appeal of the EPO as relating to those computer-implemented inventions which have no technical character[35]. Similar considerations have been applied by the EPO Boards of Appeal to the other items of Art. 52(2) of the EPC which, "as such", are excluded from patentability, for instance, to "methods for doing business", "presentations of information", or "aesthetic creations". This means that inventions relating to these items have equally been held to be patentable when they have a technical character.

The existing requirement in Europe that there has to be a *technical contribution* provided by the invention can be seen as the major difference between Europe and the U.S. In the U.S., the invention must simply be within the technological arts and no technical contribution is needed. The mere fact that the invention uses a computer or software makes it become part of the technological arts if it also provides a "useful, concrete and tangible result". That the U.S. does not require the invention to provide a technical contribution means, in particular, that the restrictions on patenting of business methods (apart from the requirements of novelty and unobviousness/inventive step) are negligible.

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1 Green Paper: COM(1997) 314 final of 24.6.1997; follow-up Communication: COM(1999) 42 final of 5.2.1999.

2 For an overview of consultations and studies, see Annex I.

[3] The expression "computer-implemented inventions" is intended to cover claims which specify computers, computer networks or other conventional programmable digital apparatus where *prima facie* the novel features of the claimed invention are realised by means of a computer program or computer programs.

[4] "The Munich Convention". Entered into force on 7 October 1977. All 15 EC Member States as well as Cyprus, Liechtenstein, Monaco, and Switzerland are currently contracting states. Turkey will be a contracting state as of 1 November 2000.

[5] In the wake of the decision of the U.S. Court of Appeals for the Federal Circuit, of 23 July 1998, in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, patent applications for business methods have soared in the U.S.

[6] Annex II provides a brief summary of the status quo from the perspective of the Commission services. For the EPO's current examination practice of computer-implemented inventions in general and of "business method applications" in particular see a paper of 19 May 2000 drawn up by the President of the EPO. It is published as Appendix 6 to the "Report on Comparative Study Carried Out Under Trilateral Project B3b", June 2000, available at http://www.jpo-iti.go.jp/saikine/tws/b3b_start_page.htm.

[7] See EPO Board of Appeal in *Vicom*, case T208/84 of 15.7.1986, [1987] OJ EPO 14.

[8] See EPO Board of Appeal in *Koch & Sterzel*, case T26/86 of 21.5.1987, [1988] OJ EPO 19.

[9] See EPO Board of Appeal in *Sohei*, case T769/92 of 31.5.1994, [1995] OJ EPO 525.

[10] No distinction between "technical effect" and "further technical effect" as made by the EPO Board of Appeal in *Computer program product I* and *II* is necessary. The respective cases are T1173/97 of 1.7.1998, 1999 OJ EPO [609] and T0935/97 of 4.2.1999, [1999] R.P.C. 861. The holdings of the two cases are largely similar. Cf. EPO, *supra*, note 6, at 5, sub note 1.

[11] And the corresponding items in Member States' patent laws.

[12] Cf. German Federal Court of Justice in *Logic Verification*, decision of 13.12.1999, [2000] GRUR 498. It should be noted that the question as to what are computer programs "as such" should be distinguished from the question of the possible claims (see point vi. of the paper).

[13] The claims have to be interpreted in the light of the description and the drawings relating to the invention. Cf., e.g., Art. 69(1) of the EPC.

[14] The law relating to copyright, as it applies to computer programs, was harmonised at Community level with the introduction of this Directive, Council Directive of 14 May 1991 on the legal protection of computer programs (91/250/EEC), [17.5.1991] OJ L 122, at 42. See Commission Report on the implementation and effects of Directive 91/250/EEC, COM(2000) 199 final of 10.4.2000.

[15] The use of the term "technical contribution" in this paper should correspond, in principle, to its use in the recent case law of the EPO Boards of Appeal. See *Computer program product I* & *II* (*supra*, note 10). On the other hand, the term "make a technical contribution" as used in the present paper is identical with the term "solve an objective technical problem" as used in the recent EPO examining practice. Cf. EPO, *supra*, note 6, at 5, sub (2).

[16] *Example:* Ensuring optimum exposure with sufficient protection against overloading of the X-ray tube by an X-ray apparatus incorporating a data processing unit. See EPO Board of Appeal, *supra*, note 8.

[17] *Example:* Co-ordination and control by software of the internal communication between programs and data files held at different processors in a data processing system. See EPO Board of Appeal in case T6/83, [1990] OJ EPO 5. For another example see EPO Board of Appeal in case T110/90, [1994] OJ EPO 557.

[18] *Example:* A computer-implemented method for entering a rotation angle value into an interactive draw graphic system allowing the rotation of displayed graphic objects with increased accuracy. See EPO Board of Appeal in case T59/93 of 20.4.1994 (unpublished).

[19] *Supra*, note 9.

[20] *Supra*, note 12.

[21] The EPO Board of Appeal has decided that "with regard to the exclusions under Article 52(2) and (3) EPC, it does not make any difference whether a computer program is claimed by itself or as a record on a carrier". See *Computer program product I & II* (*supra*, note 10).

[22] COM(1997) 314 final of 24.6.1997. The issue had already been addressed in the Commission "questionnaire on Industrial Property Rights in the Information Society", reprinted in: report on UNION Round Table Conference, Munich 9 and 10 December 1997: Patenting of Computer Software, at 293.

[23] Resolution on the Commission Green Paper, A4-0384/98, Minutes of 19.11.1998, paragraph 16, [1999] OJ EPO 197.

[24] Opinion of the Economic and Social Committee on the Green Paper, [27.4.1998] OJ C 129, at 8, points

1.14., 6.9.1.1. and 6.9.1.2.

[25] See point 11 of the conclusions of this hearing, OJ EPO 1-2/1998, at 82.

[26] The programme of the conference as well as transcripts of the speeches given there are accessible on the world-wide web at http://www.patent.gov.uk/softpat/en/frmain.html .

[27] COM(1999) 42 final of 5.2.1999. The Commission had also distributed a questionnaire on the main points that should be dealt with in the Directive and received a number of answers in 1999.

[28] See http://www.unice.org .

[29] See the EICTA position statement at http://www.eicta.org/Eicta/default.htm.

[30] The representatives of EuroLinux have published an unofficial, non-authorised report of the meeting on the web site of the EuroLinux Alliance at http://eurolinux.ffii.org/news/euipCAen.html.

[31] Opinion of the Committee of the Regions on 'The competitiveness of European enterprises in the face of globalisation – How it can be encouraged', OJ C 57, 29.2.2000, at 36 et seq., points 7.4. and 8.20.

[32] The study was conducted by the Intellectual Property Institute, London, on behalf of the Commission and finalised in March 2000.

[33] See, in particular, the following studies relating to the divergent U.S. situation: Cohen, Wesley M., Nelson, Richard R., and Walsh, John P., Protecting their Intellectual Assets: Appropriability Conditions and why U.S. Manufacturing Firms Patent (or not), Working Paper 7552, National Bureau of Economic Research, February 2000; Bessen, James and Maskin, Eric, Sequential Innovation, Patents, and Imitation, Working Paper, Department of Economics, Massachusetts Institute of Technology, January 2000; Jaffe, Adam B., The U.S. Patent System in Transition: Policy Innovation and the Innovation Process, Working Paper 7280, National Bureau of Economic Research, August 1999.

[34] For the EPO's current examination practice of computer-implemented inventions in general and of "business method applications" in particular see the reference *supra*, note 6.

[35] See *Computer program product I* and *II* (*supra*, note 10).