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**Datasheet for the decision
of 15 September 2015**

Case Number: T 2440/12 - 3.5.07

Application Number: 02016515.5

Publication Number: 1385103

IPC: G06F17/50, B29C45/77

Language of the proceedings: EN

Title of invention:

Simulation of fluid flow and structural analysis within thin walled three dimensional geometries

Patent Proprietor:

SIMCON kunststofftechnische Software GmbH

Opponent:

Moldflow Pty Ltd

Headword:

Fluid flow simulation/SIMCON

Relevant legal provisions:

EPC Art. 54, 112(1), 114(2)
RPBA Art. 13(1), 13(3)

Keyword:

Novelty - main request (no) - public prior use (yes)
Referral to the Enlarged Board of Appeal - (no)
Late-filed request - admitted (no)

Decisions cited:

G 0001/92, G 0004/95, T 0444/88, T 1169/04, T 0002/09

Catchword:

See points 6 to 12.4 of the reasons



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 2440/12 - 3.5.07

D E C I S I O N
of Technical Board of Appeal 3.5.07
of 15 September 2015

Appellant: Moldflow Pty Ltd
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 26 September
2012 rejecting the opposition filed against
European patent No. 1385103 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman R. Moufang
Members: M. Rognoni
R. de Man

Summary of Facts and Submissions

- I. The opponent (appellant) appealed against the decision of the Opposition Division rejecting the opposition against the European patent no. 1 385 103.
- II. The opposition had been based on the grounds of lack of novelty and lack of inventive step according to Article 100(a) EPC in combination with Article 52(1), 54 and 56 EPC as well as lack of sufficient disclosure to carry out the invention according to Article 100(b) EPC. Only the ground of lack of novelty is relevant to the outcome of the appeal.
- III. As to the alleged lack of novelty, the opponent essentially argued that the invention, by the patent proprietor's admission, had been publicly used before the priority date of the contested patent, and that the admissions were contained in the following documents:
- D6: Extract of submission filed by the patent proprietor in court suit 21 O 16535/05 before the Munich District Court I on 14 March 2006;
- D7: Extract of submission filed by the patent proprietor in court suit 21 O 16535/05 before the Munich District Court I on 21 December 2005.
- The prior use was in the form of sales of a software product that embodied the claimed invention. These sales had made the invention available to the public before the filing date of the patent in suit.
- IV. In the proceedings before the Opposition Division the patent proprietor contested that sales of a software product using the technique described in the patent

- would take away the novelty of the claimed invention. In the patent proprietor's view, computer software in assembler code comprised only the basic instructions for the processor and it was more or less impossible to reconstruct a complicated modelling and simulation technique from a large computer program expressed in executable code.
- V. In the contested decision (see point 2 of the reasons), the Opposition Division held, *inter alia*, that mere disassembly of an available executable code would not enable the skilled person to reconstruct the underlying mathematical method for a finite element program. The Opposition Division therefore concluded that the subject-matter of both claims 1 and 23 did not lack novelty as a result of public prior use.
- VI. In the statement of grounds of appeal, the appellant maintained that claims 1 to 25 of the patent lacked novelty following publication by public prior use of a software product which, as admitted by the patent proprietor in D6 and D7, embodied the invention.
- VII. In reply to the statement of grounds of appeal, the patent proprietor (respondent) did not dispute that a software product had been presented and sold to the public before the priority date of the opposed patent. However, in accordance with the decision of the Opposition Division, the respondent argued that the public use of the software product did not disclose the underlying algorithm. Additionally, the respondent filed a new claim 1 by way of auxiliary request 1.
- VIII. In a communication accompanying the summons to oral proceedings, the Board *inter alia* noted that it appeared to be uncontested that a software product

based on the method according to claim 1 had been presented and sold to the public before the priority date of the patent in suit. Consequently, the question at issue was whether the public use of the software product resulted in the public availability of the corresponding method. An essential point to be addressed at the oral proceedings was therefore what kind of information was, in principle, made available to the public through the distribution and use of said software product and to what extent such information anticipated the claimed method. The parties were also invited to comment on the question whether the sale of a software product implies the reproducible execution of the corresponding software and, if so, whether this anticipates a claim encompassing the method implemented by the software product.

- IX. In reply to the summons to oral proceedings, scheduled to take place on 15 September 2015, the appellant informed the Board, with letter dated 8 April 2015, that Dr. Andrew Morton, an Australian patent attorney, would join the appellant's representative in attending the oral proceedings. Furthermore, the appellant requested that Mr. Morton be allowed to speak under the supervision of the appellant's representative.

- X. With letter dated 4 September 2015, the respondent announced that Dr. Paul Filz, one of the inventors of the patent in suit and managing director of the patent proprietor, and Dr. Karl Webelhaus, also one of the inventors of the opposed patent would accompany the respondent's representative. Furthermore, the respondent requested that both Dr. Filz and Dr. Webelhaus be allowed to make oral submissions on technical issues.

XI. Oral proceedings were held as scheduled on 15 September 2015. During these proceedings, the respondent withdrew the auxiliary request 1 on file and, as a new first auxiliary request, submitted a question to be referred to the Enlarged Board of Appeal and, as a second auxiliary request, filed a new set of claims 1 to 3 corresponding to claims 23 to 25 as granted.

At the end of the oral proceeding, the Chairman pronounced the Board's decision.

XII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested, as a main request, that the appeal be dismissed, as a first auxiliary request, that the submitted question be referred to the Enlarged Board of Appeal, and, as a second auxiliary request, that the patent be maintained in amended form on the basis of claims 1 to 3 submitted in the oral proceedings.

XIII. Claim 1 of the contested patent reads as follows, whereby two evident typographical errors present in the patent specification as published have been removed:

"Computer-implemented method of simulating a fluid flow within thin-walled three-dimensional geometries in which the input for the simulation is an outer skin or a volumetric geometry description, wherein
a Finite Element Mesh is generated on the surface of the outer skin or the volumetric geometry description,
for getting a numerical information of the local part thickness a first defined thickness is achieved by

measuring the length of the vector starting from the centre of gravity of each polygon normal to the element plane in the direction to the inside of the part until the vector leaves this part,

inside the surface mesh a framework of internal rod elements is generated extending from node to node of the polygons through the part's inside within reasonable low distance from the normal direction

after defining the injection points on the polygons, the material parameter for a fluid, and the process condition, a fluid flow simulation is performed using the generated mesh and the internal rod elements, and

storing at least the pressure and the filling patterns for said fluid."

The original German wording of the question to be referred to the Enlarged Board of Appeal is as follows:

"Sind eine Nutzung oder ein Verkauf eines Software-Produkts, bei denen sämtliche Merkmale eines Patentanspruchs verwirklicht werden, für den Patentanspruch neuheitsschädlich, wenn diese Handlungen vor dem Prioritätstag des Patentanspruchs stattfanden, und zwar unabhängig von der Komplexität des Software-Produkts und ohne Beleg dafür, dass ein Analyseverfahren die Ermittlung der Merkmale des Patentanspruchs ermöglicht[?]"

The above question can be translated as follows:

"Is a use or sale of a software product, in which all features of a patent claim are realised, novelty-destroying for the patent claim, if these acts took place before the priority date of the patent claim, and that regardless of the complexity of the software

product and without evidence of a method of analysis which allows the determination of the features of the patent claim?"

Claim 1 according to the second auxiliary request reads as follows:

"Computer-implemented method of performing a structural analysis within thin-walled three-dimensional geometries in which the input for the analysis is an outer skin or a volumetric geometry description, wherein

 a Finite Element Mesh is generated on the surface and

 for getting a numerical information of the local part thickness a first defined thickness is achieved by measuring the length of a vector starting from the centre of gravity of each polygon normal to the element plane in the direction to the inside of the part until the vector leaves this part,

 inside the surface mesh a framework of internal rod elements is generated, extending from node to node of the polygons through the part's inside within reasonable low distance from the normal direction,

 after defining the material properties, the boundary conditions and the load, a structural analysis is performed by using the generated structure, and storing as results from this analysis at least the displacement of the nodes and the remaining stress."

XIV. The appellant's arguments relevant to the Board's decision may be summarised as follows:

In the opposition proceedings the patent proprietor's defence against the alleged public prior use of a software product embodying the present invention was

that the method claimed in the patent in suit was kept as a trade secret, because the source code of the software was not made available to the public.

The Opposition Division accepted that the prior use had taken place, but did not accept that the method implemented by the software product had, as a consequence, become part of the state of the art. In fact, the Opposition Division concluded that disassembly of an available executable would not enable the person skilled in the art to reconstruct the underlying mathematical model for a finite element program.

However, according to the case law of the boards of appeal (cf. T 444/88), the theoretical possibility of having access to information rendered it available to the public irrespective of how the information was made accessible. In the case of prior use of a product, there had to be no particular reason for actually analysing a product for its features to become part of the state of the art (cf. G 1/92).

The possibility of reverse engineering of a software product, such as with a disassembler, meant that the prior sale and public prior use of the software product allowed the skilled person to obtain a code in assembler language, and hence to determine the individual steps needed to perform all functionalities of the original program.

It should also be noted that reverse engineering, e.g. by means of a disassembler, which had been known for many years before the priority date of the patent, differed from the analytical techniques considered in typical prior use cases of chemical compositions (cf.

G 1/92). It was indeed conceivable that it might not be possible to have certain chemical compositions analysed and reproduced by the skilled person, so that the sale of such chemical compositions would not make them a part of the state of the art. However, software products were different, as they had to be executable by a conventional processor. This implied that the software product had to be read by a computer, and, consequently, that it could be analysed and reproduced by the skilled person.

The Opposition Division had required for the prior use of a software product to take away the novelty of the claimed method that the output of a disassembler should reveal the underlying mathematical model used for the fluid flow simulation, including the use of a framework of rod elements in conjunction with the two-dimensional surface mesh. However, it was inappropriate to require this level of disclosure.

It was well established that the public prior use of a single embodiment encompassed by a claim took away the novelty of the claimed subject-matter. The application of this principle was particularly evident in decisions dealing with the public prior use of chemical compositions.

The output of the disassembler processing the respondent's software product would comprise a large number of steps falling within the normal operation of a computer, expressed in a low level language but easy to understand. A skilled person stepping through the disassembled software line-by-line would execute the claimed method and, at the same time, understand all the functions performed by the computer running the software. This operation constituted an embodiment of a

method which was encompassed by the claims of the patent and which, being available before the priority date of the contested patent, took away the novelty of the claimed invention.

In other words, the output of a disassembler applied to the software product in question would be an anticipating embodiment of the claimed invention. The skilled person was not required to deduce from the steps in the disassembler output the mathematical model implemented by the software product. It was sufficient to understand the functions performed by these steps, since the disassembler output already constituted a clear disclosure of an embodiment falling within the terms of claim 1 of the patent.

Moreover, it could also be argued that a software product embodying a certain method represented just another form of disclosure of that method expressed in computer-readable form. By executing step-by-step the computer program on a virtual machine the skilled person, without disassembling the machine code, would have been able to follow all the operations performed by the computer while, at the same time, executing the method embodied by the software. Running a software program in this way - which was compatible with copyright protection - revealed all the operations to be performed by the processor.

The second auxiliary request filed in the oral proceedings should be rejected as it was late filed and the arguments for its allowability were based on facts that had never before been submitted by the respondent.

XV. The respondent argued essentially as follows:

It had never disputed that a software product implementing the present invention had been presented and sold to the public before the priority date of the opposed patent. However, in accordance with the decision of the Opposition Division, the public use of the software product did not mean that the algorithm underlying the software was to be considered state of the art. Even if in certain cases it was possible to reverse engineer computer software on the basis of disassembling and decompilation, there was no convincing evidence that it was possible in all cases and in particular in connection with the patent proprietor's software, which had a high degree of complexity and was compiled into binary machine code, to deduce the algorithm implemented by the software.

The Enlarged Board of Appeal had stipulated in G 1/92 that a product and its internal structure became state of the art if it was possible for the skilled person to discover the internal structure without "undue burden". In the present case, reverse engineering of the respondent's software, if at all feasible, would not have been successful without "undue burden".

Furthermore, contrary to the appellant's arguments, in order to take away the novelty of the claimed method, all features recited in the claim, in particular the rod elements of the mesh used for fluid flow simulation, had to be made available to public. This implied an understanding of the underlying algorithm which could not be revealed by means of a step-by-step execution of a computer program.

Apart from the above arguments, there was also the question of copyright protection which allowed disassembly and analysis of software only in cases where it became necessary in order to ensure compatibility with other computer programs. The software distributed by the patent proprietor was a stand-alone program and thus did not give rise to any interoperability issues. Hence, there would have been no legal basis for allowing its decompilation.

In view of the importance of the questions to be decided, the respondent considered that the first auxiliary request relating to the referral of such questions to the Enlarged Board of Appeal was justified and should thus be allowed.

The second auxiliary request was submitted in response to the issues discussed at the oral proceedings and in reaction to the Board's view that the prior use of the respondent's software product took away the novelty of the method according to claim 1 of the patent. As the patent comprised another method covered by independent claim 23 which was not anticipated by the respondent's software product, it was appropriate to submit a request which sought to maintain the patent in a more limited form.

Reasons for the Decision

1. The appeal is admissible.

Accompanying persons

2. According to the decision G 4/95 (OJ EPO 1996, 412) of the Enlarged Board of Appeal, oral submissions by an accompanying person in opposition or opposition appeal proceedings cannot be made as a matter of right, but only with the permission and at the discretion of the board.

- 2.1 Prior to the oral proceedings before the Board, both parties had requested that accompanying persons be permitted to make oral submissions.

- 2.2 Mr P. Filz, one of the two persons accompanying the respondent's representative, was entitled to speak at the oral proceedings in his capacity as managing director of the respondent.

However, Mr K. Webelhaus, the second person accompanying the respondent and co-inventor, and Mr A. Morton, an Australian patent attorney accompanying the appellant's representative, had, in principle, no right to make oral submissions at the oral proceedings. Furthermore, the respondent's request had been made on 4 September 2015, *i.e.* less than two weeks before the date of the oral proceedings, whereas the appellant's request specified neither the subject-matter of the proposed oral submissions nor the qualifications of the accompanying person.

- 2.3 In the present case, neither party expressed any reservations against oral submissions being made by the other party's accompanying person. Hence, the Board decided to exercise its discretion in accordance with G 4/95 and to allow both persons to speak. Nonetheless the Board reserved the right to reconsider its decision in the course of the proceedings, if necessary.

The present invention

3. As specified in paragraph [0001] of the opposed patent, the present invention "pertains to the simulation of fluid flow and structural analysis within thin-walled three-dimensional geometries in which the input for the simulation is an outer skin or a volumetric geometry description and contains a mesh of Finite Elements or in which a mesh of Finite Elements is generated" (emphasis added).
- 3.1 As explained in paragraph [0030], input for the simulation is an outer skin or volumetric geometry description of the part, as it may be provided by standard CAD files. An appropriate mesh of finite elements is then generated on the CAD surfaces.

According to paragraph [0030], point 6, "[t]o perform a process simulation the solver needs a numerical information of the local part thickness. This applies to the midplane as well as to the surface model. In the surface model it is possible to determine the local thickness information by measuring the length of a vector starting in the center of gravity of each triangle normal to the element plane in the direction to the inside of the part until the vector leaves the part. This is the first defined thickness. If no reasonable vector length can be found, because e.g. the

stl file is corrupt, a reasonable thickness will be automatically defined. In addition the user may also define a range in which the thickness should be" (emphasis added).

3.2 As a simulation performed on the basis of a two-dimensional mesh generated only on the outer surface of a thin-walled object generally does not produce realistic results, the method of the invention builds *"a semi-volumetric mesh, by generating two-noded elements within the part volume like in a three dimensional framework"* (published patent, page 6, lines 4 and 5).

3.3 In other words, the gist of the invention consists essentially in supplementing a finite element mesh generated on the surface of a thin-walled three-dimensional geometry with a "framework of internal rod elements", whereby each rod element extends between nodes of two opposite surface mesh elements along a direction essentially normal to these mesh elements.

4. Claim 1 expresses the steps of the computer-implemented method of the invention as follows:

- (a) a Finite Element Mesh is generated on the surface of the outer skin or the volumetric geometry description,
- (b) for getting numerical information of the local part thickness a first defined thickness is achieved by measuring the length of the vector starting from the centre of gravity of each polygon normal to the element plane in the direction to the inside of the part until the vector leaves this part,

- (c) inside the surface mesh a framework of internal rod elements is generated extending from node to node of the polygons through the part's inside within reasonable low distance from the normal direction,
- (d) after defining the injection points on the polygons, the material parameter for a fluid, and the process condition, a fluid flow simulation is performed using the generated mesh and the internal rod elements, and
- (e) at least the pressure and the filling patterns for said fluid are stored.

Prior use

- 5. The crucial issue of the present case is the effect of the alleged public prior use (see Sections III-VIII above) on the patentability of the claimed invention.
- 5.1 The essential facts of the prior use are not in dispute. Prior to the filing date of the opposed patent, the respondent already commercialised its software product Cadmould. After having been sued by the appellant for patent infringement, the respondent intended to disclose the method embodied in this software in order to demonstrate that it was based on its own development and did not infringe the appellant's patent. Since the respondent did not wish that the disclosed information be unprotected, it decided to file its own patent application - *i.e.* the European patent application No. 02016515 leading to the opposed patent - in the assumption that a valid patent could still be granted notwithstanding the prior commercialisation of its software (see documents D6, page 8, and D7, page 6).

5.2 Consequently, the respondent repeatedly emphasised in national court proceedings that the teaching of the patent application did not differ from the technical features of the commercialised software. This can be exemplified by the following statements in proceedings before the District Court I of Munich (see document D6, pages 7 and 8):

"Die Beklagte tritt dem entgegen und verwehrt sich insbesondere gegen die Unterstellung der Klägerin, die Patentanmeldung [...] bewußt abweichend von der tatsächlichen Funktion der Software formuliert zu haben, um eine angebliche Patentverletzung zu verschleiern. Diese Behauptung ist durch nichts gerechtfertigt."

[Translation: "The defendant disagrees with this and rejects the plaintiff's allegation that the defendant has formulated the patent application [...] intentionally in a departure from the actual function of the software to dissimulate an alleged patent infringement. There is no justification to this allegation whatsoever."]

"Ein Softwareprodukt mit dem in der Patentanmeldung Anlage B1 beschriebenen Verfahren wurde von der Beklagten bereits im Jahre 1997 auf der Messe NPE in Chicago, USA, vorgestellt und international, z.B. auch in Brasilien, mit Veröffentlichungen angekündigt."

[Translation: "A software product featuring the method as described in the patent application as per exhibit B1 was already presented in 1997 at the NPE Trade fair in Chicago, USA, and announced in publications internationally, e.g. also in Brazil."]

- 5.3 In the context of the present opposition and appeal proceedings the appellant heavily relied on these statements and concluded that the subject-matter of all the patent claims was embodied by the commercialised software. This conclusion was never disputed by the respondent in the proceedings before the Opposition Division and in the written appeal proceedings. It is true that, at a late stage of the oral proceedings before the Board, the respondent declared that the subject-matter of claims 1 to 3 according to the auxiliary request 2 (which correspond to claims 23 to 25 of the granted patent) was not embodied by the previously commercialised software (see Section XV, last paragraph, above and points 15.2, 15.5 and 15.6 below). However, this statement is of no relevance for the assessment of the respondent's main request since this request includes several other claims, i.e. claims 1 to 22, in respect of which the respondent has never disputed that they were embodied by the software.
6. According to Article 52(1) EPC, European patents shall be granted for any invention, in all fields of technology, provided, *inter alia*, that they are new. An invention shall be considered to be new if it does not form part of the state of the art (Article 54(1) EPC). 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 of the European patent application (Article 54(2) EPC).
- 6.1 In the present case, the invention is a method to be performed by a computer (following some input by the user). As pointed out above (cf. points 3 to 3.3), the

- essential features of the method relate to the generation of a "semi-volumetric" mesh representing a thin-walled object through which fluid flow is simulated.
- 6.2 It follows from the uncontested facts set out above that any customer to whom the respondent's software product was delivered before the filing date of the patent was able to perform the claimed method, simply by running the software on a (general purpose) computer. In the Board's view, the circle of customers of an internationally commercialised software product is potentially unlimited in the sense that any interested person could have bought or otherwise acquired a copy of the software. Therefore, the respondent's customers have to be regarded as members of the public.
- 6.3 In a situation such as the present one, where a potentially unlimited number of members of the public performed or were able to perform a process by means of a commercially available software tool, the fundamental legal question arises whether, and if so, to what extent these persons had to be aware of the specific features of the performed process for the latter to have been made available to the public.
7. In the Board's view, it can be rather convincingly argued that the mere fact that any interested person who acquired the software product and used it for the purpose for which it was commercialised, i.e. for simulating a fluid flow within thin-walled three-dimensional geometries, automatically executed the method steps as defined in claim 1 of the patent, is as such already sufficient for destroying the novelty of the claimed subject-matter.

- 7.1 The factual circumstances of the present case appear to be very different from a situation where an inventor (or another individual person) carries out a process in public which is later sought to be patented. In that situation a novelty-destroying effect only occurs when cognitive information is transmitted to the public, since, without a proper understanding of the steps of the process, no member of the public would be able to carry out the process himself. On the other hand, the public prior use in the present case is characterised by the commercial availability of a software tool that allowed the repeated execution of the patented method even without requiring any understanding of the steps performed by the software.
- 7.2 Nevertheless, the Board does not base its decision on this line of argument since the parties did not specifically focus on it in their written submissions and since the Board has come to the conclusion that, as set out in the following, the subject-matter of claim 1 lacks novelty in view of the undisputed public prior use even if one assumes to the benefit of the respondent that in the present case the novelty-destroying effect presupposes a certain amount of cognitive information about the method embodied in the respondent's software.
8. In the contested decision (cf. point 2 of the reasons), the Opposition Division took the view that "*[o]n the balance of probabilities a mere disassembly of an available executable will not enable the person skilled in the art to reconstruct the underlying mathematical method for a finite element program. In particular, the person skilled in the art would not be able to directly and unambiguously derive the use of a framework of rod*

elements in conjunction with the generated mesh as part of the simulation" (emphasis added).

- 8.1 In particular, the Opposition Division concluded that, *"taken into account that a disassembler translates machine language into assembler language and not into a high-level language it is more than doubtful that a person skilled in the art would be able to deduce from code in assembler language clearly and unambiguously for example the feature 'inside the surface mesh a framework of internal rod elements is generated extending from node to node of the polygons'"*.

9. In the proceedings before the Board, the appellant, *inter alia*, argued that the present invention related to the particular geometry of the mesh used for a computer-implemented simulation of fluid flow and therefore was essentially of a mathematical nature. This kind of inventions could be expressed in formal mathematical language, in terms of a computer program or in the language of a claim. All these forms of expression constituted a disclosure as long as they were made available to the public and could, in principle, be "read" by the skilled user. This was certainly the case for a computer program that could be disassembled and translated into readable language.

10. The respondent relied basically on the line of reasoning followed by the Opposition Division and stressed that the essential teaching of the present invention, namely the generation and use of two-noded rod elements between nodes of opposite mesh elements (see feature (c) at point 4 above), could not be derived from the low-level language into which a disassembler might translate computer code. In other words, the teaching made available to the public by

means of the contested patent was not anticipated by a software product which could not possibly provide the same information to a skilled person.

10.1 It is the respondent's position that executing a complex software program on a computer can be compared to operating a "black box" with input and output terminals. The user may realise that, in response to a given input, the "black box" generates a certain output. However, this operation of the "black box" would, in general, not provide any information as to its *modus operandi* and, in this respect, would not contribute any teaching to the state of the art.

11. A computer program is essentially a set of instructions given to a computer for performing a sequence of operations on input data and for delivering corresponding output data. These instructions expressed in machine code may indeed as such normally have no understandable meaning for the user. Nevertheless, as argued by the appellant, they could be easily converted by a disassembler into human readable language.

Furthermore, by executing an application line-by-line, the skilled person would be able to see how the input data is processed and understand how the method implemented by the software product is carried out step-by-step. The information provided by the stepwise execution of the software product represents, in the Board's opinion, a form of disclosure of a specific embodiment of this method.

11.1 The respondent has essentially objected that the teaching provided by the opposed patent was not comparable to the teaching which could be obtained even by running a program step-by-step on a computer. In the

respondent's view, the skilled person would not be able to derive all the features of the method recited in claim 1 and, in particular, not become aware of the step of generating rod elements between the nodes of opposite surface mesh elements.

- 11.2 The Board concurs with the respondent that there is no evidence that the skilled person could extract from the disassembled software program or from its execution line-by-line on a computer the notion of rod elements generated between nodes of the surface meshes as recited in claim 1.

On the other hand, the Board considers that what the skilled person obtains from a disassembled code or from the stepwise execution of a software product is indeed an "alternative" description, albeit very concrete and detailed (= low-level), of the method embodied by the software.

- 11.3 In the Board's opinion, defining a known process or method in different terms does not give rise to a different process or method, just like giving a different definition of a chemical composition does not create a new chemical composition. In the present case, the method implemented by the software product before the filing date of the opposed patent was expressed in computer-readable code, whereas in the patent the method is specified in much more abstract, even somewhat metaphorical language. If the machine code of the software can be translated into human-readable language, the two representations of the method should, in principle, be considered as two different forms of disclosure of the same method which are equally available to the public.

12. The respondent has objected that unconditional decompiling or disassembling of computer programs was not allowed in Europe and that the skilled person would infringe the copyright protection when trying to decompile a software product in order to gain knowledge of the underlying algorithm. The Board notes that, in the context of a prior use involving an international commercialisation which was not restricted to Europe, the respondent's reliance on provisions of European copyright law may not be sufficient in order to demonstrate that all the respondent's customers were bound by corresponding legal restrictions. For the sake of argument, the Board nevertheless follows the respondent's point of departure and uses European copyright law as the relevant yardstick.

12.1 Article 6 of the Council Directive of 14 May 1991 on the legal protection of computer programs (91/250/EEC) as in force when the public prior use occurred (the Directive was replaced in 2009 by Directive 2009/24/EC) deals with decompilation. According to it, the authorisation of the rightholder shall not be required where reproduction of the code and translation of its form are indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs, provided that certain conditions are met. One of these conditions is that the decompilation is confined to those parts of the original program which are necessary in order to achieve interoperability.

Hence, this directive places indeed some restrictions on a full decompilation of a computer program for the purpose of understanding its structure and all its underlying algorithms.

12.2 However, the appellant has convincingly argued that it was not necessary to disassemble or decompile a program to make the corresponding operations performed by the processor "readable" for a skilled user. It would be sufficient to run the software on a virtual machine and execute it line-by-line. Although this was indeed a very tedious way of running a software program, it did not require any authorisation and would reveal the program's structure and functionalities to the skilled person in a very concrete manner.

12.3 According to Article 5, paragraph 3. of the above directive 91/250/EEC, "*[t]he person having a right to use a copy of a computer program shall be entitled, without the authorisation of the rightholder, to observe, study or test the functioning of the program in order to determine the ideas and principles which underlie any element of the program if he does so while performing any of the acts of loading, displaying, running, transmitting or storing the program which he is entitled to do*" (emphasis added).

In the light of the above, the respondent's customers were not prevented by law to load the computer program and run it line-by-line "in order to determine its underlying ideas and principles".

12.4 In essence, the Board comes to the conclusion that prior use of a software product in the form of sales makes the method implemented by the software part of the state of the art since, in principle, the skilled person could have executed the software line-by-line on a computer, and, in doing so, would have not only carried out the method, but also gained knowledge of the method steps performed by the computer.

13. The Board finds that its conclusions are in line with the opinion expressed by the Enlarged Board of Appeal in case G 1/92 (OJ EPO 1993, 277).

13.1 According to G 1/92, the chemical composition of a product is state of the art when the product as such is available to the public and can be analysed and reproduced by the skilled person, irrespective of whether or not particular reasons can be identified for analysing the composition. Furthermore, the same principle applies *mutatis mutandis* to any other product, since, as observed at point 1.1 of the reasons, the EPC does not make any distinction between chemical products and other products such as mechanical or electrical articles.

In particular, the Enlarged Board observed in point 1.4 that an essential purpose of any technical teaching is to enable the person skilled in the art to manufacture or use a given product by applying such teaching. Where it is possible for the skilled person to discover the composition or the internal structure of the product and to reproduce it without undue burden, then both the product and its composition or internal structure become state of the art.

13.2 In the case of a software product, the "internal structure" is represented by the set of instructions which constitute a program to be run on a computer. As explained above, by executing the instructions line-by-line the skilled person can derive knowledge of all the operations to be performed in order to carry out the method embodied by the software product.

13.3 Similarly, a certain electronic circuit may be described and claimed in functional terms, namely as a

combination of "means for" carrying out certain steps of a method. However, if an embodiment of this circuit is publicly available for examination, in order to implement the teaching of the claimed circuit (and of the corresponding method), it would be sufficient to reproduce the structure of the physical circuit component-by-component.

It could be argued that the teaching derivable from the "real" circuit would not be the same as the teaching provided by the description of the circuit given in a claim. Nevertheless, it follows from the established case law that the precise and detailed disclosure of the physical embodiment of a circuit takes away the novelty of the same circuit claimed in functional terms.

13.4 In summary, the point of contention in the present case is not whether the respondent's software product executed on a computer falls within the terms of the method according to claim 1 of the patent. It does, as this software product admittedly embodies the claimed invention. In the respondent's view, a software product would take away the novelty of a corresponding claimed method only if it disclosed to the skilled person the same features used in the claim to define the method. However, the Board concurs with the appellant that even a different "disclosure" of the method, as it could be obtained by executing it on a computer line-by-line without infringing copyright protection, is sufficient to take away the novelty of the method as claimed.

13.5 Hence, the Board comes to the conclusion that the subject-matter of claim 1 is not new within the meaning of Article 54 EPC following the prior use of a software

product which undisputedly embodied the claimed subject-matter.

Auxiliary request 1

14. According to Article 112(1) EPC a board of appeal shall refer a question to the Enlarged Board of Appeal if this is necessary for ensuring uniform application of the law or if a point of law of fundamental importance arises.
- 14.1 Neither party has alleged that there was diverging jurisprudence relating to the question formulated by the respondent. In fact, the appellant and the respondent have not referred to any diverging decisions and, when citing the same decisions, they have essentially highlighted aspects of these decisions that would support their different lines of argument.
- 14.2 In its argumentation, the appellant maintained that, when examining novelty, it was not necessary to assess whether a claim had been anticipated in the very terms in which it was drafted, and stated that this principle was clear from those decisions that had considered the public prior use of chemical compositions. Furthermore, the appellant referred to T 444/88 of 9 May 1990 and G 1/92 (supra) in support of the argument that the theoretical possibility of having access to information rendered it available to the public, and that this was so in cases of prior use irrespective of how the information was made accessible.

With reference to G 1/92, the respondent has in particular stressed the condition imposed by the Enlarged Board of Appeal that it should be possible for the skilled person to discover the internal structure

"without undue burden" and that this would not be case for a complex software product. In this respect, the appellant countered that a software product could always be analysed without undue burden because its structure would be disclosed to the skilled person simply by executing it step-by-step on a computer.

As to T 444/88, it is stated at point 3.1 that under the EPC the question of whether a document forms "part of the state of the art" depends on its availability, i.e. whether it is knowable to third parties. According to the decision, it is sufficient that the document was in fact available to the public before the priority date of the patent in suit, whether or not this was known to any member of the public, and whether or not any member of the public actually inspected the document.

14.3 The Board's reasoning is in line with both G 1/92 and T 444/88. As to the question of "undue burden", the Board essentially follows the appellant's view that in the case of a software program a straightforward line-by-line execution of a program on a computer would be sufficient to disclose the program's structure to the skilled person.

14.4 The appellant has also referred to decision T 1169/04 of 17 October 2006 in support of the argument that the output of a disassembler constituted an embodiment of the claimed invention that was encompassed by the claims of the patent.

The respondent has contested that T 1169/04 supported the appellant's point.

- 14.5 T 1169/04 states, at point 13 of its reasons, that the subject-matter of an independent claim is not inventive if the claim encompasses obvious modifications of publicly used product. In the present case, the software product and the claimed subject-matter relate to the same method, as admitted by the respondent. Therefore, there can be no doubt that the software product executed on a computer performs a method within the terms of claim 1 of the contested patent. The point of contention, however, is what level of disclosure is required of a software product to conclude that the software product takes away the novelty of the corresponding claimed method. In this respect, the Board considers that the decision T 1169/04 is not relevant to the present case.
- 14.6 The respondent has also cited decision T 2/09 of 12 March 2012 in support of the argument that the mathematical model/algorithm underlying the respondent's software product was protected by copyright and thus did not belong to the state of the art since there was no evidence that anyone had made it public before the filing date of the opposed patent. In particular, the respondent referred to points 4.6 to 4.8 of T 2/09 where it is stated that an unauthorised opening of an e-mail is unlawful and hence has to be regarded by analogy like information covered by a confidential agreement.
- 14.7 The Board considers that T 2/09 is not relevant for the present case because, as shown above, the structure of a software program can be deduced without infringing any existing copyright protection by executing it step-by-step on a virtual machine.

14.8 In summary, the Board finds that its conclusions are in line with the established case law of the boards of appeal relating to information made available through public prior use. Hence, uniform application of the law is ensured.

As to the interpretation of Article 54(2) EPC, the Board considers that the facts in the present case do not give rise to a point of law of fundamental importance in the meaning of Article 112(1) EPC, but relate to the level of disclosure that a public prior use of a software product embodying a claimed method should provide to take away the novelty of the method.

14.9 The Board is of the opinion that the non-existence of case law on a particular point is not reason enough in itself to refer a question of law to the Enlarged Board of Appeal, and that under the circumstances it is first and foremost for the boards of appeal to decide on the question.

14.10 Consequently, the respondent's request for referral to the Enlarged Board of Appeal is refused.

Auxiliary request 2

15. Claim 1 according to the auxiliary request 2 corresponds to claim 23 of the patent in suit and is directed to a computer-implemented method of performing a structural analysis.

15.1 According to Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA), the Board has discretion to allow amendments depending on their complexity, the current state of the proceedings and the need for procedural economy. Furthermore, according to Article

13(3) RPBA, amendments after oral proceedings have been arranged shall not be admitted if they raise issues which the Board or the other party cannot reasonably be expected to deal with without adjournment of the oral proceedings.

- 15.2 In the respondent's view, the auxiliary request 2 sought to limit the patent to a second embodiment of the invention. This request had been prompted by the negative opinion on the novelty of the main request expressed by the Board during the oral proceedings. This reaction on the part of the respondent could not come as a surprise and was justified by the fact that the patent specification disclosed more than the method embodied by the previously publicly used software product.
- 15.3 In the appellant's opinion, however, this request was filed too late and should not be admitted as it was impossible for the appellant to respond. Furthermore, the respondent had never argued that the patent specification disclosed an embodiment which had not been anticipated by the software product.
- 15.4 In the statement of grounds of appeal, the appellant requested the revocation of the contested patent, *inter alia*, because the subject-matter of claims 1 to 25 lacked novelty following the publication by prior use of a software product embodying the invention as admitted in documents D6 and D7. The appellant's objection that claims 1 to 25 lacked novelty was reiterated in the letter dated 13 August 2015.
- 15.5 The arguments submitted by the respondent in reply to the statement of grounds of appeal rested essentially on the assumption that the sale and public use of a

software product did not imply that the method implemented by such software product and its underlying algorithm became state of the art. In fact, the respondent never hinted at the fact that in any case the method according to independent claim 23 was not implemented by the software product. On the contrary, in view of the written procedure, it could not have been expected that the respondent might adopt different lines of argument in support of the patentability of the methods according to claims 1 and 23, respectively.

- 15.6 Hence, the respondent's argumentation in favour of the auxiliary request 2 relies on new facts which could have been presented in the opposition proceedings or, at least, in the written phase of the appeal proceedings, and which cannot be ascertained without further investigation on the part of the appellant and of the Board.
- 15.7 In the interest of procedural economy and fairness, in particular in *inter partes* proceedings, the Board did not consider that an adjournment of the oral proceedings or a remittal to the department of first instance for further prosecution would be justified.
- 15.8 Hence, the Board decided not to admit this late-filed request into the proceedings (Article 114(2) EPC and Article 13(1) and (3) RPBA).
16. In summary, the Board comes to the conclusion that the ground of opposition of lack of novelty according to Article 100(a) in combination with Articles 52(1) and 54 EPC prejudices the maintenance of the patent. Hence the patent has to be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



I. Aperribay

R. Moufang

Decision electronically authenticated