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**Datasheet for the decision
of 9 September 2008**

Case Number: T 0762/05 - 3.5.04

Application Number: 99967332.0

Publication Number: 1141894

IPC: G06T 7/00

Language of the proceedings: EN

Title of invention:

Method and apparatus for processing images with regions
representing target objects

Applicants:

Miller, Michael I., et al

Opponent:

-

Headword:

-

Relevant legal provisions:

-

Relevant legal provisions (EPC 1973):

EPC Art. 84, 109

Keyword:

"Clarity (yes)"

"Competence of the board (yes)"

Decisions cited:

G 0012/91, T 0843/03

Catchword:

See point 1.



Case Number: T 0762/05 - 3.5.04

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 9 September 2008

Appellants: Miller, Michael I., et al.
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Representative: Grünecker, Kinkeldey,
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 3 February 2005
refusing European application No. 99967332.0
pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman: F. Edlinger
Members: C. Kunzelmann
T. Karamanli

Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse European patent application No. 99 967 332.0. This application was filed as international application No. PCT/US99/29798 under the Patent Cooperation Treaty (PCT) and published as WO 00/36565 A1 in a first version and a corrected second version.

II. The reasons given in the decision for refusing the application were a lack of clarity of claims 25 to 36 of the main request, because they related to "an article of manufacture", and a lack of inventive step of the subject-matter of claim 1 of the auxiliary request having regard to documents

D3: WO 97/09690 A1 and

D4: SORLIÉ C. et al. 'Matching of digitised brain atlas to magnetic resonance images.' In: Medical & Biological Engineering & Computing, Vol. 35, No. 3, May 1997, pages 239 to 245; XP 000677432.

According to the decision under appeal, D4 disclosed the general concept of registering patient images to an atlas. D4 also disclosed a scaling which implied a reduction transformation of the second image in size prior to registration and disclosed the definition of landmarks in both the patient images and the atlas images. D3 disclosed a method for detecting organs of interest. To this end input images were morphologically skeletonised, a seed point in an anatomical structure of interest was selected and only the structure of

interest was reconstructed. The method of D3 was ideally suited to finding structures that could serve as landmarks for registering images. The combination of D3 and D4 produced no non-obvious effects and anticipated the subject-matter of claim 1 of the auxiliary request.

- III. The decision under appeal also contained observations that the wording of independent claims 1 and 13 of the main request was very broad and vague. It was observed that claim 1 was so broad that, for instance, the method known from D3 could be read onto claim 1.
- IV. The applicants appealed and filed new claims with the statement of grounds of appeal.
- V. In the framework of considering whether they should rectify their decision, the examining division crossed both of the main alternative boxes (rectification and non-rectification) on EPO Form 2701, which was signed by all three members and labelled as public in the file. The appeal was referred to the Board of Appeal.
- VI. In a communication annexed to a summons to oral proceedings the board *inter alia* informed the appellants that the observations concerning a broad and vague wording also applied to the claims then on file.
- VII. In reply to the summons, the appellants filed new claims and description pages with a letter dated 8 August 2008.
- VIII. The appellants argued essentially that a broad claim wording was not a criterion for assessing the

patentability of a claim. The claims had to be read in the context of the entire application with the eyes of a person skilled in the art of image treatment.

- IX. Oral proceedings before the board of appeal were held on 9 September 2008, at which the appellants filed a new main request comprising claims 1 to 15, a new auxiliary request comprising claims 1 to 15 and new description pages 2, 3, 4, 11, 13, 14, 15 and 19.

The appellants requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 15 of the main request filed during the oral proceedings and, alternatively, on the basis of claims 1 to 15 of the auxiliary request filed during the oral proceedings.

- X. Claim 1 of the main request reads as follows.

"A method for registering a first and a second image, wherein the first image is a medical atlas image from a reference library and wherein the second image is a medical image and contains a target object, comprising the steps of:

identifying a seed region in the second image containing one or more image data elements representing the target object;

defining a model of image data elements representing the target object;

defining a model of image data elements representing structure in the second image other than the target object;

growing the seed region in the second image to increase the number of image data elements representing the

target object contained in the seed region such that a boundary enclosing the target object is defined while reducing the number of image data elements representing structure other than the target object contained in the seed region;
transforming the second image to reduce the size of the seed region and to restore the representation of structure in the second image to a shape that corresponds to removal of the target object such that a deformation caused by the introduction of the target object is reversed; and
registering the first image and the transformed second image to produce a composite image."

Claim 8 of the main request corresponds to claim 1 and reads as follows.

"An apparatus for registering a first and a second image, wherein the first image is a medical atlas image from a reference library and wherein the second image is a medical image and contains a target object, comprising:
means for identifying a seed region ...;
means for defining a model ... ;
means for defining a model ... ;
means for growing the seed region ... ;
means for transforming the second image ... ; and
means for registering the first image and the transformed second image to produce a composite image."

(The ellipses (...) indicate text which is identical to the text of the corresponding feature in claim 1.)

Claim 15 of the main request reads as follows.

"Computer program product, comprising computer-executable instructions for causing a computer to perform the steps of the method of one of the claims 1 - 8."

Reasons for the Decision

1. *Competence of the board*

According to Article 109 EPC 1973, a contested decision is either rectified or remitted to the Board of Appeal. In the present case doubts as to the true intention of the examining division arise (see point V). However, even if the examining division had intended to rectify its decision, no interlocutory revision took place, since neither a formal decision on rectification (EPO Form 2710) nor an official communication implying rectification was despatched to the appellants. Decisions taken following written proceedings only enter into force when they are notified (G 12/91, OJ EPO 1994, 285, point 2 of the reasons for the decision, see also T 843/03). Moreover the examining division referred the appeal to the Board of Appeal. From the circumstances of the present case the board concludes that the examining division's intention was not a rectification under Article 109 EPC 1973, but remittal to the Board of Appeal to decide on the present appeal. The board is therefore competent to deal with the present appeal.

2. The appeal is admissible.

3. *Main request: amendments (Article 123(2) EPC)*

3.1 The corrected version of the present application (also published as WO 00/36565 A1) contains five substitute sheets of drawings. The pages of the description and claims appear to be identical to those of the international application as originally filed and published in the first version of WO 00/36565 A1. In this decision any reference to the application as originally filed is a reference to the publication of the international application in the first version.

3.2 Claims 1 and 8 are based on claim 14 of the application as originally filed and comprise further features based on the description. The features "wherein the first image is a medical atlas image from a reference library" and "wherein the second image is a medical image" are based, for instance, on page 9, last line, and the paragraph bridging pages 12 and 13 of the application as originally filed. The feature of (means for) growing the seed region "such that a boundary enclosing the target object is defined" is based on the sentence bridging pages 6 and 7 of the application as originally filed. The feature "to restore the representation of structure in the second image to a shape that corresponds to removal of the target object such that a deformation caused by introduction of the target object is reversed" is, for instance, based on claims 6 and 16 and page 11, lines 15 to 21, of the application as originally filed. And the feature (means for) "registering the first image and the second transformed image to produce a composite image" is, for instance, based on page 1, lines 9 to 13, in

conjunction with page 14, lines 18 to 20, of the application as originally filed.

3.3 The dependent claims correspond to dependent claims of the application as originally filed, and the amendments made to the description remove inconsistencies between the description and the amended claims.

3.4 Hence the board judges that the amendments made in appeal proceedings satisfy the requirements of Article 123(2) EPC.

4. *Main request: clarity (Article 84 EPC 1973)*

4.1 The reason given in the decision under appeal for the lack of clarity does not apply to the present claims because none of them relates to "an article of manufacture".

4.2 Also the observations made in the decision under appeal relating to a vague wording do not apply to the amended claims now under consideration.

4.2.1 The independent claims make clear that the images to be registered are a medical image containing a target object and a medical atlas image from a reference library. Furthermore it is clear that a transformed version of the medical image is registered with the atlas image to produce a composite image. The transformation of the second image (restoring structure and reversing a deformation, thus creating a normal appearance without the target object, such as a tumour; see page 14, lines 1 to 20) makes registering with a (normal) atlas image easier. Once the transformation

for creating the transformed version is known, it also allows registering of the untransformed medical image (containing the target object, such as a tumour) with the medical atlas image.

4.2.2 The claims also make clear that the target object and its complement in the medical image, namely the structure other than the target object, are represented by respective models of image data elements. The models themselves are not further specified, reflecting the fact that many different objects are potentially target objects and many different image complements are potentially a structure other than the target object within the meaning of the claims.

4.2.3 The claims also make clear that the growing of a seed region - which initially comprises one or more image data elements representing the target object - is carried out with the result that a boundary enclosing the target object is defined. Thus the grown seed region finally encloses the target object sufficiently closely to enable its removal when the second image is transformed. In reality the grown seed region may enclose image data elements which do not belong to the target object, reflecting the fact that any model of the target object is imperfect. Hence it is clear that the grown seed region defines the boundary between the part of the medical image which, according to the model, corresponds to the target object and the complementary part of the medical image which, according to the model, does not correspond to the target object (see page 6, last line, to page 7, line 2, of WO 00/36565 A1).

- 4.2.4 Furthermore the claims make clear that a transformation of the medical image is carried out so that the size of the grown seed region is reduced and the representation of structure other than the target object is restored to a shape corresponding to a removal of the target object. Hence the transformation of the medical image reduces the size of the seed region to an extent which corresponds in effect to a removal of the target object, and it reverses a deformation caused by the target object in the structure other than the target object.
- 4.3 The board is satisfied that the examining division's observations concerning broad or vague claims do not apply to the present claims and it does not see any other objections concerning lack of clarity arising from the wording of the claims.
- 4.4 Hence the board judges that the claims of the main request are clear (Article 84 EPC 1973).
5. The reasons given in the decision under appeal concerning lack of inventive step do not apply to the present claims of the main request, since they comprise features specifying the transforming of the medical image which go beyond the mere finding of structures which could serve as landmarks for registering medical images. As set out in section 4 above, growing the seed region and transforming the second image within the meaning of the present claims serve to restore a (different) shape of structure whereby a deformation caused by the target object is reversed. This is not merely a reduction transformation in size or a selection of parts of the image, such as the structure of interest. Therefore the board can neither see any

convincing reason in the decision under appeal nor find any disclosure in documents D3 and D4 (the only documents considered in the decision under appeal) which would render the subject-matter of the present claims of the main request obvious to a person skilled in the art.

6. In view of the above the board concludes that the decision under appeal has to be set aside.
7. The present application documents differ substantially from those considered by the first instance. In particular, the claims of the main request are such that there is no reasoned assessment by the first instance of both substantive issues (such as inventive step having regard to documents other than D3 and D4) and on the issue of consistency between the description and the claims. Furthermore the amendments have been made in oral proceedings so that there is an increased risk of errors such as the reference to claim 8 in claim 15 (which refers to method steps, not an apparatus as in claim 8). Therefore the board, exercising its discretion under Article 111(1) EPC 1973, remits the case to the first instance for further prosecution.
8. Hence the board does not need to consider the auxiliary request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution.

The Registrar:

The Chairman:

D. Sauter

F. Edlinger