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Datasheet for the decision of 26 January 2007

Case Number: T 1197/04 - 3.2.02

Application Number: 97925562.7

Publication Number: 0955935

IPC: A61B 19/00

Language of the proceedings: EN

Title of invention:
Stereotactic surgical procedure apparatus and method

Applicant:
Northwestern University

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 84

Keyword:
"Clarity (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1197/04 - 3.2.02

D E C I S I O N
of the Technical Board of Appeal 3.2.02
of 26 January 2007

Appellant: Northwestern University
1801 Maple Avenue
Evanston
Illinois 60201-3135 (US)

Representative: Klunker . Schmitt-Nilson . Hirsch
Winzererstrasse 106
D-80797 München (DE)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 11 May 2004 refusing European application No. 97925562.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: T. Kriner
Members: S. Chowdhury
A. Pignatelli

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division dated 11 May 2004 to refuse European patent application No. 97 925 562.7.

The ground of refusal was that the subject-matter of the main request and of the auxiliary request then on file did not involve an inventive step having regard to US-A-5 389 101 (D4).

On 12 July 2004 the appellant (applicant) lodged an appeal against the decision and paid the prescribed fee on the same day. On 21 September 2004 a statement of grounds of appeal was filed.

II. The Board summoned the appellant to oral proceedings, and annexed a communication in which an objection of lack of clarity of the claims and description was set out. The communication indicated that the nature of the invention was not understood from the application.

III. Oral proceedings were held on 26 January 2007. The appellant requested that the decision under appeal be set aside and that the application be granted on the basis of claims 1 to 32 filed on 14 May 1997 (main request), or claims 1 to 30 filed with the letter of 16 January 2003 (first auxiliary request), or claims 1 to 30 filed with the letter of 22 March 2004 (second auxiliary request).

IV. Independent claims 1, 29, and 30 of the main request read as follows:

"1. A method for planning a stereotactic surgical procedure using a fluoroscope for generating images of the body, the method comprising the steps of: placing adjacent to the body a registration artifact including a plurality of fiducials at known positions relative to a known coordinate frame of the artifact; displaying on a computer monitor an image taken of the patient's body and the registration artifact; receiving an input to identify two-dimensional coordinates of the fiducials of the registration artifact displayed on the image; and registering the image by creating a geometric model having parameters, said model projecting three-dimensional coordinates into image points, and numerically optimizing the parameters of the geometric model such that the projections of the known three-dimensional coordinates of the fiducials best fit the identified two-dimensional coordinates in the image.

29. An apparatus for planning a stereotactic surgical procedure using a fluoroscope for generating images of the body, the apparatus comprising: means for placing adjacent to the body a registration artifact including a plurality of fiducials; means for displaying an image taken of the body and the fiducials; means for identifying two-dimensional coordinates of the fiducials in an image; means for registering an image with respect to said fiducial artifact; means for receiving inputs to select and adjust a virtual guidewire or targetpoint, while the projections of said guidewire or targetpoint are displayed superimposed

upon the image; and means for producing an output to adjust the coordinates of a tool guide.

30. An apparatus for planning a stereotactic surgical procedure for a linear trajectory insertion of a surgical instrument into a body using a fluoroscope for generating images of the body, the apparatus comprising: a registration artifact located adjacent to the body, the registration artifact including a plurality of fiducials located at known three-dimensional coordinates relative a known coordinate frame; means for displaying at least one image taken of the body and the fiducials on at least one computer monitor; means for identifying two-dimensional coordinates of the fiducials in each image; and means for numerically optimizing parameters of a geometric model, said model projecting three-dimensional coordinates into image points, such that the projections of the known three-dimensional coordinates of the fiducials best fit the identified two-dimensional coordinates in the image."

Claims 2 to 28, 31, and 32 are dependent claims.

The independent claims of the auxiliary requests do not differ materially, for the purposes of the present decision, from those of the main request,

V. The appellant argued as follows in the written and oral submissions:

The claims defined a registration process which was necessary to match an image into registration with the real coordinates of a system in which an operation was performed. The present technical problem was identical

to that of document D4, which was that images of a patient did not exactly correspond to the patient owing to distortions, and it was necessary to correlate the two so that a surgical instrument could be used accurately.

However, the present solution was different to that of D4. The known coordinates of the fiducials were used to calculate a projected image using a geometrical model. The geometrical model was a mathematical device such as a projection or a non-linear equation with parameters, as set out in the appendices which a person skilled in the art would know and understand. The parameters of the model were altered in order to get the best fit.

Reasons for the Decision

1. The appeal is admissible.

2. *Clarity of claim 1*

2.1 Each of the expressions "receiving an input", "to identify two-dimensional coordinates of the fiducials of the registration artifact displayed on the image", "registering the image", "by creating a geometric model having parameters", "said model projecting three-dimensional coordinates into image points", and "numerically optimizing the parameters of the geometric model such that the projections of the known three-dimensional coordinates of the fiducials best fit the identified two-dimensional coordinates in the image" is unclear of itself and when considered with the other

steps of the claim. Each expression will be considered in turn below.

Moreover, as will be demonstrated below, the claim is self-contradictory and the appellant's explanation of the application contradicts the claim wording.

2.2 The expression "receiving an input" is not clear in the context since it is not clear what the source of the input is, i.e. whether this is a user input or a predetermined stored input, and since it is also not clear what is input, see point 2.3.

2.3 It is not clear which frame of reference is used to define the coordinates of the fiducials. According to the appellant the patient table serves to define the coordinates of the fiducials (see Figure 1 of WO-A-97/42898). However, the artefact 24 which holds the fiducials 26 is not attached to the patient table 14 and no step of referencing the artefact 24 to the table 14 is defined. Therefore, it is not clear that the table does indeed define the frame of reference for the coordinates of the fiducials. Moreover, a further contradiction arises in that, according to the appellant this step of the claim is meant to input the coordinates of the fiducials in the workspace, but the claim (and also claims 29 and 30) states that what is input are the coordinates of the fiducials in the image. Thus, it is not clear what value is input in the first step above.

2.4 In the next step of claim 1 it is not clear what the image is registered to. According to the appellant it is registered to another image, but a second image is not defined in claim 1.

2.5 The expression "creating a geometric model having parameters" is not clear in the context. The term "geometric model having parameters" itself is vague and very broad and no example is given of what such a model might be or how it is created. According to the appellant it may comprise simple geometric projection, or a more complex non-linear equation. The fact that this expression may include such diverse concepts (neither of which is, however, disclosed in the application), demonstrates its vagueness and speculative nature.

2.6 The claim does not state which object has its three-dimensional coordinates projected by the model into image points, or how this is done. Moreover, it is not clear whether or not these three-dimensional coordinates are related to the two-dimensional of the fiducials, defined earlier in the claim.

2.7 The step of "numerically optimizing the parameters of the geometric model such that the projections of the known three-dimensional coordinates of the fiducials best fit the identified two-dimensional coordinates in the image" is also not clear in the absence of how such optimising is done. Moreover, this step amounts to a definition of the desired result rather than to the concrete steps used to achieve the desired best fit.

3. Independent claims 29 and 30 and all the independent claims of the first and second auxiliary request also contain the above unclear expressions (point 2.1, above) and also do not meet the clarity requirement of Article 84 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

V. Commare T. K. H. Kriner