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Datasheet for the decision of 30 April 2013

Case Number: T 2102/12 - 3.2.02

Application Number: 08866761.3

Publication Number: 2231051

IPC: A61B 19/00

Language of the proceedings: EN

Title of invention:
Medical robotic system with functionality to determine and display a distance indicated by movement of a tool robotically manipulated by an operator

Applicant:
Intuitive Surgical Operations, Inc.

Headword:
-

Relevant legal provisions:
EPC Art. 84, 123(2)

Keyword:
"Method claim including an "unclaimed" surgical process - clarity (no; main and auxiliary requests 1 to 3)"
"Added subject-matter (yes; auxiliary request 4)"

Decisions cited:
G 0001/07, T 0836/08

Catchword:
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Case Number: T 2102/12 - 3.2.02

D E C I S I O N
of the Technical Board of Appeal 3.2.02
of 30 April 2013

Appellant: (Applicant)
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Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 10 July 2012 refusing European patent application No. 08866761.3 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: E. Dufrasne
Members: M. Stern
C. Körber

Summary of Facts and Submissions

I. The applicant lodged an appeal against the decision, dispatched on 10 July 2012, refusing European application No. 08 866 761.3. The Examining Division held that the subject-matter of all requests were surgical methods excepted from patentability under Article 53(c) EPC.

II. The notice of appeal with the statement of grounds of appeal was received on 14 September 2012 and the appeal fee was paid on the same day.

III. The Board presented its provisional opinion in a communication dated 17 January 2013 raising objections regarding the patentability of the method claims under Article 53(c) EPC, as well as their compliance with Articles 84 and 123(2) EPC.

IV. Oral proceedings took place on 30 April 2013.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request or, in the alternative, of one of the first to third auxiliary requests, all filed with letter dated 14 March 2013, the fourth auxiliary request filed during the oral proceedings or the fifth auxiliary request filed with letter dated 14 September 2012.

V. Claim 1 of the different requests reads as follows.

Main request:

"1. A method for determining and displaying information of an operator indicated distance using a medical robotic system (100), the claimed method being performed contemporaneously with an unclaimed surgical procedure in which a tool (600, 800, 1200) is being robotically manipulated by a slave manipulator (200) in response to operator manipulation of an input device (108, 109), the claimed method comprising:
capturing images indicating movement of the tool (600, 800, 1200);
sensing joint positions of the slave manipulator (200);
determining a distance moved by the tool (600, 800, 1200) using the sensed joint positions and forward kinematics of the slave manipulator (200); and
displaying the captured images and information of the distance on a monitor (104) of the medical robotic system (100) so as to indicate movement of the tool (600, 800, 1200) and visually associate the information of the distance with the movement of the tool (600, 800, 1200)."

First auxiliary request:

"1. A method, performed by a medical robotic system (100), for determining and displaying information of an operator indicated distance using the medical robotic system (100), the claimed method being performed contemporaneously with an unclaimed surgical procedure in which a tool (600, 800, 1200) is being robotically manipulated by a slave manipulator (200) in response to operator manipulation of an input device (108, 109), the claimed method comprising:

capturing images indicating movement of the tool (600, 800, 1200);
sensing joint positions of the slave manipulator (200);
determining a distance moved by the tool (600, 800, 1200) using the sensed joint positions and forward kinematics of the slave manipulator (200); and
displaying the captured images and information of the distance on a monitor (104) of the medical robotic system (100) so as to indicate movement of the tool (600, 800, 1200) and visually associate the information of the distance with the movement of the tool (600, 800, 1200)."

Second auxiliary request:

"1. A method, performed within a medical robotic system (100), for determining and displaying information of an operator indicated distance using the medical robotic system (100), the claimed method being performed contemporaneously with an unclaimed surgical procedure in which a tool (600, 800, 1200) is being robotically manipulated by a slave manipulator (200) in response to operator manipulation of an input device (108, 109), the claimed method comprising:
capturing images indicating movement of the tool (600, 800, 1200);
sensing joint positions of the slave manipulator (200);
determining a distance moved by the tool (600, 800, 1200) using the sensed joint positions and forward kinematics of the slave manipulator (200); and
displaying the captured images and information of the distance on a monitor (104) of the medical robotic system (100) so as to indicate movement of the tool (600, 800, 1200) and visually associate the information

of the distance with the movement of the tool (600, 800, 1200)."

Third auxiliary request:

"1. A method, performed within a medical robotic system (100), for determining and displaying information of an operator indicated distance using the medical robotic system (100), the claimed method being performed contemporaneously with an unclaimed surgical procedure in which a tool (600, 800, 1200) is being robotically manipulated by a slave manipulator (200) in response to operator manipulation of an input device (108, 109), the claimed method comprising:
receiving captured images indicating movement of the tool (600, 800, 1200);
receiving sensed joint positions of the slave manipulator (200);
determining a distance moved by the tool (600, 800, 1200) using the sensed joint positions and forward kinematics of the slave manipulator (200); and
displaying the captured images and information of the distance on a monitor (104) of the medical robotic system (100) so as to indicate movement of the tool (600, 800, 1200) and visually associate the information of the distance with the movement of the tool (600, 800, 1200)."

Fourth auxiliary request:

"1. A method, performed by a processor within a medical robotic system (100), for determining and displaying information to an operator, the claimed method comprising:

receiving signals representative of captured images indicating movement of a tool (600, 800, 1200);
receiving signals representative of sensed joint positions of a slave manipulator (200);
determining a distance moved by the tool (600, 800, 1200) using the signals representative of the sensed joint positions and forward kinematics of the slave manipulator (200); and
outputting a signal to cause the captured images and information of the distance to be displayed on a monitor (104) of the medical robotic system (100)."

Fifth auxiliary request:

"1. A medical robotic system (100) comprising:
a tool (600, 800, 1200);
a robotic arm having a plurality of joints to move the tool (600, 800, 1200) and having a plurality of sensors to sense movement of the plurality of joints;
an image capturing device (140) positioned to capture an image of the tool (600, 800, 1200);
a monitor (104);
an input device (108, 109); and
a processor (102) configured to move the robotic arm and the tool (600, 800, 1200) in response to operator manipulation of the input device (108, 109), display images received from the image capturing device (140) on the monitor (104), determine a distance moved by the tool (600, 800, 1200) using data received from the plurality of sensors and forward kinematics of the robotic arm, and display information of the determined distance on the monitor (104) so as to indicate movement of the tool (600, 800, 1200) and visually

associate the information of the distance with the movement of the tool (600, 800, 1200)."

Claims 2 to 8 of the fifth auxiliary request are dependent claims.

VI. The arguments of the appellant are summarised as follows:

(i) *Main and first to third auxiliary requests*

The appellant's intention was not to encompass the operator-performed surgical step in the claims. Rather, the method the appellant was seeking to protect was a method performed by a device for determining and displaying distance information, the method being performed contemporaneously and in parallel with a non-claimed surgical process. This was expressed in claim 1 of the main and first to third auxiliary requests by specifying *"the claimed method being performed contemporaneously with an unclaimed surgical procedure in which a tool is being robotically manipulated by a slave manipulator in response to operator manipulation of an input device"* (emphasis added).

While it was recognised that the formulation of the independent method claims was "a little unorthodox", the claims were clear and met the requirements of Article 84 EPC. The claims made it clear that the essence of the methods was the determination of the distance moved by the tool, and not the surgical process of moving it. The claims clarified beyond any doubt that the claimed method did not include the contemporaneously performed surgical procedure in which

the tool was being robotically manipulated by a slave manipulator in response to operator manipulation of the input device. In accordance with G 1/07 (in particular, Reasons point 4.3.2) and T 836/08, such a method claim should be allowable as the claimed method had no functional link to an effect on the body, the claimed method performed by the device having no effect on the body. Its effect was to display information. The mere fact that the method was performed during a surgical intervention did not render it unpatentable, as explicitly stated in the third paragraph of point 5 of the Reasons of G 1/07.

(ii) *Fourth auxiliary request*

Given the constraints of the EPC regarding the patentability of surgical methods, the appellant should be allowed to just claim the measuring method as performed within the processor described in paragraph [0090] et seq. in relation to the flow diagram of Figure 19, and in paragraph [0039] relating to Figure 4. There was consequently no extension of subject-matter beyond the content of the original application.

(iii) *Fifth auxiliary request*

The fifth auxiliary request included only the apparatus claims which the Examining Division considered to be allowable.

Reasons for the Decision

1. The appeal is admissible.

2. *Main and first to third auxiliary requests*

2.1 The application relates to medical robotic systems (such as the da Vinci® Surgical System from the applicant) which allow to robotically move a tool on an articulated arm in response to the surgeon's manipulation of an input device (paragraphs [0003] and [0005]). As indicated in paragraph [0034] of the description, the expression "tools" used in the application denotes surgical instruments. More specifically, the invention is essentially directed to the determination of the distance moved by the surgical tool using sensed data from the robotic manipulation or movement of the tool by the surgeon and to display information of the moved distance on a monitor of the medical robotic system (paragraph [0010]).

2.2 Claim 1 of the main and first to third auxiliary requests defines a method for determining and displaying information of an operator indicated distance moved by a tool using a medical robotic system. However, rather than defining in the claims (i.e. claiming) the matter for which protection is sought as stipulated by Article 84 EPC, the method of claim 1 of the main and first to third auxiliary requests is claimed in terms of *"claimed"* method steps and *"unclaimed"* method steps.

2.3 The appellant explained that it was seeking to protect, in an admittedly "unorthodox" way, a method performed

by a device for determining and displaying distance information, the claimed method being performed contemporaneously and in parallel with a non-claimed, or *"unclaimed"*, surgical process. This was expressed in claim 1 of the main and first to third auxiliary requests by specifying *"the claimed method being performed contemporaneously with an unclaimed surgical procedure in which a tool is being robotically manipulated by a slave manipulator in response to operator manipulation of an input device"* (emphasis added).

2.4 In the present case, the so-called *"claimed"* method includes the steps of determining the distance moved by the surgical tool using sensed data from the robotic manipulation or movement of the tool, while the so-called *"unclaimed"* surgical procedure includes precisely that same robotic manipulation (performed by the surgeon). Hence, these two "types" of method steps are inextricably interrelated, whereby their separation into *"claimed"* and *"unclaimed"* claim features is artificial and ambiguous.

This inextricable relationship becomes particularly apparent in the example of Figure 10 described in paragraph [0073]. According to this example, a surgical tool is moved by the surgeon to a first position allowing a force sensor on the tool to make contact with an anatomic structure which starts the measurement of the coordinates of that first position, the tool being then moved to a second position at which, after renewed contact of the anatomic structure by the force sensor, the coordinates of the second position are measured, the system's processor then determining the

distance moved by the tool from the measured coordinates of the two positions. This example makes it clear that the movement of the tool by the surgeon on the one hand, and the determination of the distance moved by the tool using the sensed joint positions on the other, are intertwined and inextricably related.

Thus, contrary to the appellant's view, claiming the measurement of the movement of the tool while *"unclaiming"* the movement itself renders the subject-matter for which protection is sought unclear. Consequently, the appellant's intention to eliminate from the presently claimed method the contemporaneously performed surgical process fails for lack of compliance with the requirements of Article 84 EPC. As mentioned in point 4.3.1 of the Reasons of G 1/07, the question of whether or not a surgical step can be omitted has to be assessed under Article 84 EPC and depends on whether the claimed invention is fully and completely defined by the features of the claim without that step, which is not the case here as explained above. The presently claimed method of intertwined non-surgical ("claimed") and surgical ("unclaimed") steps is not comparable to that underlying T 836/08.

2.5 For the above reasons, claim 1 of the main and first to third auxiliary requests is not allowable under Article 84 EPC.

3. *Fourth auxiliary request*

3.1 Claim 1 defines a method performed by a processor within a medical robotic system comprising, in essence, the determination of a distance moved by the tool using

the signals representative of the sensed joint positions of a slave manipulator. However, claim 1 no longer includes the method step of the medical robotic system moving the tool through robotic manipulation by an operator which was included even in the broadest method definitions given in the originally filed application.

3.2 As explained under point 2.1 above, the application as originally filed makes it clear that the medical robotic system is such that it allows to robotically move a tool in response to the surgeon's manipulation (of an input device). This feature is presented throughout the entire description (see, for example, paragraphs [0003], [0005], [0010] and [0011]), and is also contained in the original independent device claims 13 and 27. The Board therefore considers this to be an indispensable feature of the medical robotic system of the present application.

Also the original independent method claims 1 and 21 include the corresponding indispensable method step of the medical robotic system moving the tool through robotic manipulation by an operator.

3.3 Claim 1 of the fourth auxiliary request instead defines a method performed by a processor within a medical robotic system comprising, mainly, the determination of distance moved by the tool using the signals representative of the sensed joint positions of a slave manipulator. However, the claim no longer includes the aforementioned original indispensable limitation of the medical robotic system moving the tool through robotic manipulation by an operator. It is clear that the

processor described in paragraph [0090] et seq., mentioned by the appellant, is just a part of the specific medical robotic system described in the application. Also paragraph [0039] cited by the appellant, which refers to the processor, does not provide sufficient support for a complete broader embodiment, since said paragraph should be read in the context of the application as a whole as just describing a component of the system.

3.4 Thus, the presently claimed method unallowably generalises the disclosed robotic systems to systems in which tools may be moved automatically or independently of manipulations by the surgeon.

3.5 Consequently, the subject-matter of claim 1 of the fourth auxiliary request extends beyond the content of the application as originally filed, contrary to Article 123(2) EPC.

4. *Fifth auxiliary request*

4.1 The appeal proceedings only dealt with the patentability requirements under Article 53(c) EPC raised in the impugned decision as the sole ground for refusal, as well as the objections of lack of clarity and added subject-matter mentioned above which resulted from attempts to overcome the exception from patentability under Article 53(c) EPC.

4.2 The claims of the fifth auxiliary request have been restricted to device claims, whereby neither the objections under Article 53(c) EPC raised in the impugned decision nor the associated mentioned

deficiencies of lack of clarity and added subject-matter apply. It is moreover noted that the impugned decision briefly states under the "Summary of facts and submissions" (point 1, penultimate paragraph) that this request "would be grantable".

4.3 The Board therefore remits the case to the department of first instance for further prosecution, pursuant to Article 111(1) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution.

The Registrar: The Chairman:

D. Hampe E. Dufrasne