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**Datasheet for the decision  
of 9 October 2007**

**Case Number:** T 0810/06 - 3.2.02

**Application Number:** 02705017.8

**Publication Number:** 1372476

**IPC:** A61B 5/055

**Language of the proceedings:** EN

**Title of invention:**

Catheter for use in a magnetic resonance imaging apparatus

**Applicant:**

Koninklijke Philips Electronics N.V., et al

**Opponent:**

-

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 52(4), 52(1), 54, 56

**Keyword:**

"Surgical method (no)"

"Novelty (yes)"

"Inventive step (yes)"

**Decisions cited:**

T 0383/03

**Catchword:**

-



Case Number: T 0810/06 - 3.2.02

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.02  
of 9 October 2007

**Appellant:**

Koninklijke Philips Electronics N.V.  
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**Representative:**

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**Decision under appeal:**

Decision of the Examining Division of the  
European Patent Office posted 27 January 2007  
refusing European application No. 02705017.8  
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 27 January 2006 to refuse European patent application No. 02 705 017.8.

The application was refused on the grounds that claims 7 and 8 related to a surgical method which was excluded from patentability by Article 52(4) EPC, and the subject-matter of claim 1 lacked novelty having regard to document D2.

The following documents were cited during the examination procedure:

D1: US-A-4 572 198

D2: WO-A-99/19739.

- II. On 2 March 2006 the appellant (applicant) lodged an appeal against the decision and paid the prescribed fee on the same day. On 30 May 2006 a statement of grounds of appeal was filed.

The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the main request, which consists of the following documents:

The application as published but with claim 1 filed with the grounds of appeal replacing original claim 1

Description pages 1 and 5 to 12 as published

Description pages 2 and 3 filed with the grounds of appeal

Description page 4 filed by telefax on 4 October 2007

Figures 1 to 14 as published.

III. Independent claims 1, 7, and 8 of the main request read as follows:

"1. A catheter for use during examination of an object by means of an MR imaging apparatus with an RF transmission coil (4) wherein on the catheter (10) there are mounted a transmission unit (11) for generating pulses of RF oscillations of a first frequency (f1) and a transmission antenna (116) for emitting the pulses of RF oscillations, thereby exciting nuclear magnetization in the object to be examined in a near field of the transmission antenna in such a manner that said magnetization can be picked up by an RF receiving coil (5, 6) of the MR imaging apparatus and reproduced in an MR image so as to visualize a position of the catheter.

7. A method of forming an MR image of an object to be examined by means of a magnetic resonance imaging apparatus as well as of visualizing in the MR image a position of a catheter as claimed in claim 1 which is introduced into the object to be examined, characterized in that switching over takes place between a first mode of operation and a second mode of operation in an alternating fashion, the RF transmission coil (4) of the MR imaging apparatus being operative so as to generate an MR image of the object

to be examined in the first mode of operation while the transmission unit (11) of the catheter (10) is switched off, whereas in the second mode of operation the RF transmission coil (4) is switched off and the transmission unit (11) of the catheter is operative so as to excite nuclear magnetization in the near field of the transmission antenna (16), which nuclear magnetization is picked up by the MR imaging apparatus and reproduced in the MR image formed in the first mode of operation, thus visualizing the position of the catheter.

8. A method of forming an MR image of an object to be examined by means of a magnetic resonance imaging apparatus, as well as of visualizing in the MR image a position of a catheter as claimed in claim 1 which is introduced into the object to be examined, characterized in that the RF transmission coil (4) of the MR imaging apparatus and the transmission unit (11) of the catheter (10) are operative essentially simultaneously so that intensified nuclear magnetization is excited in the near field of the transmission antenna (16), which nuclear magnetization is picked up by the MR imaging apparatus and reproduced in the MR image formed, thus visualizing the position of the catheter".

Claims 2 to 6 and 9 to 12 are dependent claims.

### **Reasons for the Decision**

1. The appeal is admissible.

2. Article 52(4) EPC

The examining division found that method claims 7 and 8 included the invasive step of introducing a catheter into a patient to be examined, and refused the claims under Article 52(4) EPC on the grounds that the methods had a surgical character. The Board does not agree with this finding.

2.1 In the present case claims 7 and 8 must be interpreted as only covering the formation of an MR image of an object to be examined by means of a magnetic resonance imaging apparatus and of visualizing in the MR image the position of a catheter.

2.1.1 Each of claims 7 and 8 includes the phrase "visualizing in the MR image a position of a catheter as claimed in claim 1 **which is introduced into the object to be examined**" [emphasis added]. The examining division understood the highlighted part of this phrase to define the step of introducing a catheter into the object (or patient) to be examined.

However, a more reasonable interpretation of this phrase is "visualizing in the MR image a position of a catheter as claimed in claim 1 which **has been introduced into the object to be examined**". Thus, the step of introducing the catheter into a body is not included within the scope of the method claims; the steps thereof concern only the emission and detection of pulses from an already inserted catheter.

2.1.2 Support for this interpretation is found in the description as follows:

The general problem which the application addresses is the purely technical one of rendering a catheter tip visible in an MR image. This is set out on page 1, lines 9 to 11, and page 2, lines 15 to 21. The objective problem is set out on page 1, lines 18 to 27 (see point 5.1 below). Given this technical problem, it is evident that the application is concerned with the technical problem of imaging the catheter, and not the medical problem of its insertion.

The manner of positioning or inserting a catheter is well known, and nowhere in the description is the step of introducing a catheter mentioned. In the particular description Figure 1 shows an MR imaging apparatus about a body, with a catheter already inserted into the body. Page 5, lines 16 onwards describe the operation of the apparatus on an already inserted catheter.

Therefore, the most appropriate construction of the phrase "a catheter introduced into an object to be examined" is "a catheter (which has been) introduced into an object to be examined", and claims 7 and 8 are to be interpreted as a method including technical steps performed on an already inserted catheter.

- 2.2 When this interpretation is invoked the methods according to claims 7 and 8 represent technical methods for forming an MR image of an object to be examined by means of a magnetic resonance imaging apparatus and of visualizing in the MR image a position of a catheter, and not surgical methods, i.e. methods which are suitable or potentially suitable for maintaining or restoring the health, the physical integrity, or the

physical well-being of a human being or animal (see T 383/03, OJ EPO 2005, 159, points 3.2 to 3.4).

2.3 Claims 7 and 8, therefore, are not concerned with a method of surgical treatment of the human or animal body within the meaning of Article 52(4) EPC and are, therefore, not excluded from patentability under this provision.

### 3. *Amendments*

3.1 Whereas original claim 1 was divided into two parts by the words "characterized in that", new claim has been cast in a one-part form. The claim has also been reworded but has the same scope as the original claim 1 as far as the catheter is concerned. The only difference concerns the MR imaging apparatus, which is now said to have an RF receiving coil rather than RF receiving coils in original claim 1, and this amendment is supported by the description, for example on page 7, lines 2 to 4 of WO-A-02/074164, and is allowable. The apparatus is also said to possess an RF transmission coil, which coil is mentioned in original claims 7 and 8.

3.2 The description on pages 2 and 3 has been amended accordingly. The new application documents meet the requirements of Article 123(2) EPC.

### 4. *Novelty*

Claim 1 of the application requires the catheter to possess a transmission unit for generating RF pulses and a transmission antenna for emitting the RF pulses



for exciting nuclear magnetization in the object to be examined. It is clear from claim 1 and the application that the transmission unit and the transmission antenna form an active unit, i.e. that the RF pulses are generated in situ in the catheter.

Thus, each embodiment of the claimed catheter includes all components necessary for generating RF waves. The embodiment described with reference to Figures 2 and 3 includes a microchip 11 comprising an oscillator 113 and an antenna 116 (see WO-A-02/074164, page 6, lines 14 to 17 and 20 to 27), and this chip 11 is also included in the embodiments of the catheter of Figures 8 to 10. Claim 1, accordingly, defines a transmission unit for generating pulses of RF oscillations mounted on the catheter.

- 4.1 Document D1 describes apparatus for determining the location of a catheter tip in an NMR image. The tip includes a conducting loop which is excited by an external weak pulse source and supports a dipole magnetic field which distorts the NMR image locally to provide an image cursor in the NMR image display. Pairs of images are compared in a subtraction mode to emphasise the location of the catheter tip.

This apparatus is passive in that does it not itself generate and transmit pulses; it is energised from an external source. Moreover, the apparatus is not said to generate RF pulses, instead it generates a weak dipole magnetic field for locally distorting the NMR image, and not for exciting nuclear magnetization in the object to be examined.

D1 does not anticipate the catheter of claim 1, accordingly.

4.2 Document D2 describes apparatus for determining the location of a catheter tip in an MR image. The tip includes a resonant circuit made up of an inductor and a capacitor, which resonant circuit is excited by the applied high frequency pulses of the MR system. This causes amplification of the magnetic field to cause nuclear magnetization in the area adjacent the circuit.

This is also a passive circuit since it depends on the application of an external resonant frequency to become energised, it does not itself generate RF pulses. The application makes a clear distinction between active and passive circuits (page 1, lines 14 and 15), and it is clear that it only seeks to claim catheters with the former type of circuit.

4.3 Therefore, D2 also does not anticipate the catheter of claim 1.

4.4 The methods of claims 7 and 8 require the step of energising the catheter of claim 1, and are also novel, accordingly.

5. *Inventive step*

5.1 The only relevant document, D2, does not suggest mounting a transmission unit for generating pulses of RF oscillations of a first frequency and a transmission antenna for emitting the pulses of RF oscillations on a catheter. The person skilled in the art has no

incentive to replace the passive system of D2 with the active system of the application.

A disadvantage of the prior art passive arrangement of D2 is explained on page 1, lines 18 to 27 of the application. That is, that the Q-factor of a passive circuit is small and it is necessary to include switches in the circuit, which degrades Q-factor the further.

The presently claimed arrangement uses an active circuit which ensures that the MR relaxation signal to be acquired is higher than in the case of a passive circuit, and overcomes the above drawback.

The claimed catheter includes an inventive step, accordingly.

The methods of claims 7 and 8 require the step of energising the catheter of claim 1, and also involve an inventive step, accordingly.

**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 with the order to grant a patent on the basis of the following documents:

The application as published but with claim 1 filed with the grounds of appeal replacing original claim 1

Description pages 1 and 5 to 12 as published

Description pages 2 and 3 filed with the grounds of appeal

Description page 4 filed by telefax on 4 October 2007

Figures 1 to 14 as published.

The Registrar

The Chairman

V. Commare

T. Kriner