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Datasheet for the decision of 1 February 2017

Case Number: T 1710/11 - 3.4.01

Application Number: 06727684.0

Publication Number: 1866660

IPC: G01R33/36

Language of the proceedings: EN

Title of invention:
MRI SYSTEM COMPRISING A SCAN ROOM INTERFACE FOR A/D-CONVERSION OF MR SIGNALS BETWEEN A RECEIVER COIL UNIT AND A REMOTE SIGNAL PROCESSING UNIT

Applicant:
Koninklijke Philips N.V.

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:

Catchword:

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Case Number: T 1710/11 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 1 February 2017

Appellant: (Applicant)	Koninklijke Philips N.V. High Tech Campus 5 5656 AE Eindhoven (NL)
Representative:	de Haan, Poul Erik Philips International B.V. Philips Intellectual Property & Standards High Tech Campus 5 5656 AE Eindhoven (NL)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 31 March 2011 refusing European patent application No. 06727684.0 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Assi
Members:	F. Neumann
	R. Winkelhofer

Summary of Facts and Submissions

I. The appeal lies against the decision of the Examining Division refusing the European application no. 06 727 684.0 for failure to comply with the requirements of Article 84 EPC 1973, Article 83 EPC 1973 and Article 123(2) EPC. In an obiter dictum the Examining Division indicated that, in its opinion, the subject-matter of claim 1 did not involve an inventive step.

II. In the statement setting out the grounds of appeal the Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1-8 filed with the statement setting out the grounds of appeal.

As an auxiliary request, the Appellant requested that the case be remitted to the Examining Division for a decision on novelty and inventive step.

Oral proceedings were requested as a further auxiliary measure.

III. The Board issued a communication in preparation of oral proceedings setting out its preliminary opinion with regard to inventive step. The Board explained that, in order to avoid a potentially lengthy discussion of the clarity objections contained in the contested decision, and since the wording of claim 1 was clear enough to allow the inventive step to be assessed, the questions of clarity and sufficiency of disclosure would only be dealt with if the claimed subject-matter was found to be new and inventive.

IV. In response to the Board's communication, in a phone conversation with the Board's Rapporteur on 24 January

2017, the Appellant indicated that it also preferred this approach, noting that any attempts to overcome the innumerous clarity objections raised by the Examining Division would essentially be a waste of time if the claimed subject-matter proved to lack an inventive step.

No substantive response was submitted with respect to the Board's assessment of inventive step. Instead, the Appellant informed the Board, by letter of 27 January 2017, that no-one would appear at the oral proceedings and requested a decision on the basis of the written submissions.

V. The following documents were referred to during the appeal proceedings:

D1: WO-A-2004/089211;
D5: US-B-6 339 717;
D6: US-A-5 666 055.

VI. Claim 1 reads as follows:

"*A magnetic resonance imaging system (1), the system comprising:*
- an examination zone (5) arranged to receive a body for examination;
- a receiving unit (14) located in the examination zone (5);
- an interface unit (17) located in the examination zone (5) and arranged separately from the receiving unit (14); and
- a signal processing unit (21) disposed at a location (2) remote from the receiving unit (14) and the interface unit (17);

- wherein the receiving unit (14) comprising [sic] a first receiver (15) adapted to receive a spin resonance signal generated in the examination zone (5), and a first transmitter (16) adapted to transmit the spin resonance signal to the interface unit (17); and
- wherein the interface unit (17) comprises a second receiver (20) for receiving the transmitted spin resonance signal, an analog to digital converter (19) adapted to generate a digital signal in response to the spin resonance signals received by the second receiver (20), and a second transmitter (20) for transmitting the digitized signal to the signal processing unit (21),
characterized in that the interface unit (17) is located in the table (6, 7) for positioning the body in the examination zone (5)."

The wording of claims 2 to 8 is not relevant for the present decision and so will not be reproduced here.

VII. The arguments of the Appellant, insofar as they are relevant to the present decision, are derivable from the reasons for the decision.

Reasons for the Decision

1. The appeal is admissible.

2. Inventive step

2.1 Document D5 represents the closest prior art.

2.2 All features of the preamble of claim 1 are disclosed in the Figure 4 embodiment of D5. Specifically, D5 discloses an MRI system (column 4, lines 59-61)

comprising an examination zone (shielded RF cabin 4) to receive a body for examination (column 4, line 66 to column 5, line 4) and a receiving unit (RF reception coil 20') located in the examination zone.

The receiving unit (RF reception coil 20') may be seen to comprise a "*first receiver*" adapted to receive spin resonance signals generated in the examination zone, and a "*first transmitter*" adapted to transmit the spin resonance signals to the A/D converter 16".

The Examining Division was of the opinion that the input stage of the A/D converter could be equated to the "*second receiver*" of claim 1 and that the output stage, which supplies the digital signal to the transmission line 23', could be equated to the "*second transmitter*" of claim 1. The Board sees no reason to depart from this understanding and consequently considers that the A/D converter 16" of D5 may be equated to the "*interface unit*" of claim 1.

The A/D converter 16" in Figure 4 is located in/on the housing of the magnet assembly (column 6, lines 55-57). The signal line 26 is used to convey signals from the RF reception coil 20' to the A/D converter 16". The interface unit (A/D converter 16") is thus located separately from the receiving unit (RF reception coil 20').

The signal line 23' is used to convey the digitalised signals from the A/D converter to the insert card 9" and the signal processing means (column 6, lines 59-61). The signal processing unit (insert card 9") is thus disposed at a location remote from the receiving unit (RF reception coil 20') and the interface unit (A/D converter 16").

2.3 The imaging system of claim 1 is distinguished from the imaging system depicted in Figure 4 of D5 in that the interface unit (the A/D converter 16") is located in the patient table.

2.4 Starting from D5, the objective technical problem to be solved is to provide an alternative location for the interface unit.

2.5 The posing of this problem does not confer any inventive merit on the claimed subject-matter since it is clear from D5 that there is some flexibility in where the A/D converter may be located: Figures 3 to 5 show the A/D converter in a coil plug, in the housing of the magnet assembly and in the wall of the RF cabin respectively.

This flexibility implies - as the Examining Division suggested - that the A/D converter may be placed at any convenient location. Whilst the Board acknowledges that D5 contains no suggestion that the A/D converter may be positioned in the patient table, this location merely represents a further option which the skilled person could select, in accordance with the specific circumstances. In particular, when the receiver coil assembly is mounted in the table, the cable routing could be simplified if the A/D converter were also located in the table, particularly since the coils move together with the patient.

2.6 D6 is relevant in this respect. D6 discloses an arrangement in which the spine receiver coil assembly 20 is located in the patient table (column 5, lines 51-52). It can be seen from D6 that when the coils are located in the patient table, the terminals for

connection to the control unit and the signal processing unit are provided on the table unit. Specifically, Figure 3 shows that the output of the coil system is connected to the MRI system preamplifier chain at terminal 5 on the "*doghouse assembly*" 4 (column 5, lines 30-36: the Appellant prefers to call this a "*dock house assembly*", this term being a more accurate description of the docking function afforded by the input terminal 5).

2.7 Whilst the Board acknowledges that D6 does not refer explicitly to the position of the A/D converter, it would be obvious to arrange the A/D converter in the same area as the preamplifier chain. No inventive activity can therefore the recognised in locating the interface unit in the patient table.

2.8 The Appellant argued that there was no reason why the skilled person would choose to include the A/D converter in the dock house assembly of the patient gantry in the arrangement of D6.

However, the Board considers that in the case of spine coils being arranged in the table top of the patient gantry, the skilled person would at least contemplate arranging the A/D converter in the gantry unit as well, instead of having a signal line running between the receiver coils and the housing of the magnet assembly, as in the Figure 4 embodiment of D5. This would certainly make sense in terms of tidying up the cable-routing and - even in the absence of any explicit suggestion in the prior art to do so - would be an obvious measure to avoid cable clutter.

2.9 The Board is not convinced by the Appellant's argument that the teaching of D6 was not compatible with the

arrangement of D5. The Appellant appears to believe that the wording of claim 1 required that the A/D converter be located in front of the preamplifier and that this arrangement would not make sense since the A/D converter was typically arranged behind the preamplifier. However, the Board sees no reason why the entire electronics unit in the dock house of D6 may not be considered an "*interface unit*", in which case it would not matter, for the above considerations, that a preamplifier is arranged between the RF input 5 (the "*second receiver*" in the terms of claim 1) and the A/D converter.

2.10 The Appellant also argued that D1 taught away from locating the A/D converter close to the receiving coils.

The Board cannot follow this argument. The Board agrees that page 7, lines 20-23 of D1 explains that conventional A/D converters are not suitable for use in the vicinity of the examination zone. However, D1 goes on to explain that this problem may be overcome by keeping the shielding components as thin as possible and keeping the A/D converter as small as possible (page 7, line 23 to page 8, line 1). There is therefore no reason why the A/D converter may not be located in the same structural unit as the receiver coils provided that these precautions are adhered to.

2.11 For these reasons, the subject-matter of claim 1 does not involve an inventive step (Article 56 EPC).

3. In view of this finding, the Appellant's main request cannot be granted. Moreover, the auxiliary request, to remit the case to the Examining Division for a decision on novelty and inventive step, is redundant.

4. The Board appreciates that only one reason is required to refuse an application and that, in the present case, the numerous clarity objections set out in the contested decision more than sufficed for this purpose. Nevertheless, the Board has some sympathy for the Appellant's view that the insistence of the Examining Division that the clarity issues should be dealt with before a definitive assessment of inventive step could be undertaken, led to a procedure which - at least for the Applicant - was rather inefficient.

As may be seen from the obiter dictum of the contested decision, the Examining Division understood the claimed subject-matter sufficiently to be "*convinced that the idea of placing the A/D converter in the patient table does not comprise an inventive step*". However, the Examining Division held that "*a final decision on [novelty and inventive step] can properly be taken only after the scope of the claims has been clarified*". In the knowledge that the subject-matter of the "*unclear*" claim was not inventive, it does indeed appear to be somewhat inefficient to issue a decision which gives lack of clarity - but not a lack of inventive step - as a reason for refusal, thus forcing the Appellant to address each of the clarity objections before being able to challenge the inevitable inventive step objection. This approach does not appear to be in line with the "*constructive and helpful*" attitude that the Guidelines require the examiner to adopt (C-I,2). In the present case, the Board decided to deal with the question of inventive step itself, thus concentrating on the issue which ultimately sealed the fate of the application. But it was equally possible that the Board, once satisfied that the claimed subject-matter would meet the requirements of Article 84 EPC 1973 and

Article 123(2) EPC, could have chosen to remit the case to the Examining Division for a decision on this issue in order to give the Appellant the benefit of two instances. Such potential ping-ponging of the application would of course negatively impact the overall procedural economy of the application and may be avoided if all reasons for refusal were to be included in the contested decision.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Assi

Decision electronically authenticated