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Datasheet for the decision of 1 March 2013

Case Number: T 0928/09 - 3.4.01

Application Number: 00965003.7

Publication Number: 1151315

IPC: G01R 33/563, G01R 33/483

Language of the proceedings: EN

Title of invention:
Rapid three-dimensional magnetic resonance tagging for studying material deformation and strain

Applicant:
GENERAL ELECTRIC COMPANY

Headword:
-

Relevant legal provisions (EPC 1973):
EPC Art. 84

Keyword:
"Clarity (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0928/09 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 1 March 2013

Appellant: (Applicant)
GENERAL ELECTRIC COMPANY
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Schenectady, NY 12345 (US)

Representative:
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 26 November 2008 refusing European patent application No. 00965003.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: G. Assi
Members: H. Wolfrum
J. Geschwind

Summary of Facts and Submissions

I. European patent application 00 965 003.7 (publication No. EP 1 151 315) was refused by a decision of the examining division dispatched on 26 November 2008 for various reasons of non-compliance with the provisions of the EPC, including lack of clarity (Article 84 EPC 1973).

II. The applicant lodged an appeal against the decision on 4 February 2009. The prescribed appeal fee was paid on the same day. A statement of grounds of appeal was filed on 3 April 2009.

The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of a set of claims 1 to 3 filed with the statement setting out the grounds of appeal.

Furthermore, an auxiliary request for oral proceedings was made.

III. On 12 October 2012 the appellant was summoned to oral proceedings to take place on 21 February 2013.

In an annexed communication pursuant to Article 15(1) RPBA the Board identified *inter alia* problems having regard to the clarity and support by the description of the claims on file.

IV. The appellant did not comment on the Board's observations nor did it file any further amendments. Instead, by letter of 18 October 2012 the appellant withdrew its request for oral proceedings and requested

that a written decision be issued in accordance with the current state of the file.

V. Oral proceedings were cancelled by notification of 9 November 2012.

VI. Independent claim 1 of the appellant's request reads as follows :

"*1. A cardiac imaging method for producing a magnetic resonance (MR) image of a selected region of interest which is moving and deforming within a beating heart in an MR imaging system, said method comprising:*

a) applying a first preparatory pulse sequence to said region of interest, responsive to a cardiac cycle reference signal and prior to an MR imaging pulse sequence for a first cardiac cycle, said first preparatory pulse sequence being adapted to simultaneously suppress longitudinal magnetization of spins located outside of said selected region and to impose a grid pattern on said selected region by periodic spatial modulation of the longitudinal magnetization; wherein said preparatory pulse sequence includes applying an RF pulse sequence, said RF pulse sequence being adapted to produce a flip angle in the spins located inside the selected region, such that the first preparatory pulse sequence applies a positive longitudinal magnetization in a first cardiac cycle;

b) applying a second preparatory pulse sequence to said region of interest responsive to a cardiac cycle reference signal from a subsequent cardiac cycle and prior to an MR imaging pulse sequence for the subsequent cardiac cycle, said second preparatory pulse sequence being adapted to simultaneously suppress

longitudinal magnetization of spins located outside of said selected region and to impose the grid pattern on said selected region by periodic spatial modulation of the longitudinal magnetization, said first and second preparatory pulse sequences having frequency contents and amplitudes which substantially isolate said selected region of interest, such that the second preparatory pulse sequence applies a negative longitudinal magnetization in a cardiac cycle next or alternate to the first cardiac cycle; and,

c) acquiring, by means of said MR imaging pulse sequences, sets of acquired imaging data from said first and subsequent cardiac cycles, subtracting one of the sets of acquired image data from the other by complex subtraction of the two acquired complex k-space data sets acquired during the first and second cardiac cycles, and reconstructing the image data to generate at least one image of said isolated selected region of interest."

Claims 2 and 3 are dependent claims.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rule 99 EPC and is, therefore, admissible.

2. Clarity (Article 84 EPC 1973)

2.1 The present invention is concerned with magnetic resonance imaging of moving objects, such as the myocardial wall of a patient (application : page 1,

lines 5 to 7; page 2, lines 18 to 21). In this context, preparatory excitation pulse sequences are applied which serve to isolate a moving and deforming region of interest from adjacent tissue so as to enable selective excitation by the subsequent, actual MR imaging pulse sequence (application : page 8, lines 5 to 30).

Method steps a) and b), which address the application of a first and a second preparatory pulse sequence prior to an MR imaging pulse sequence for a first and a consecutive cardiac cycle, respectively, do not define in a clear and unambiguous manner all of the essential elements of the preparatory pulse sequences. As it is apparent in particular from the description of Figures 3, 6, 7 and 9, the preparatory RF pulse sequence has to comprise a non-selective RF excitation pulse in cooperation with suitable gradient field pulses in addition to a selective RF excitation pulse, so that the spin magnetization outside the selected region is saturated and a flip angle is produced in the spins located inside the selected region.

2.2 Moreover, step b) erroneously implies that the application of a negative longitudinal magnetization is the result of the isolation of the selected region of interest.

2.3 For these reasons, the Board has come to the conclusion that the appellant's request does not comply with the requirement of Article 84 EPC 1973.

The appellant's request is therefore not allowable.

3. Although having been informed about the above deficiencies, the appellant neither presented further comments nor proposed further amendments to the claims.

Given the fact that already a single deficiency renders a request unallowable, there is no need, for the purpose of the present decision, to consider other matters concerning the claims of the appellant's request on file.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

R. Schumacher G. Assi