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**Datasheet for the decision
of 12 August 2009**

Case Number: T 1281/06 - 3.4.01

Application Number: 99310458.7

Publication Number: 1013226

IPC: A61B 8/06

Language of the proceedings: EN

Title of invention:

Method and apparatus for optimal data mapping of power doppler images

Applicant:

GENERAL ELECTRIC COMPANY

Opponent:

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Headword:

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Relevant legal provisions:

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Relevant legal provisions (EPC 1973):

EPC Art. 84

Keyword:

"Clarity (no)"

Decisions cited:

T 1271/05

Catchword:

-



Case Number: T 1281/06 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 12 August 2009

Appellant:

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 31 March 2006
refusing European application No. 99310458.7
pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman: B. Schachenmann
Members: P. Fontenay
H. Wolfrum

Summary of Facts and Submissions

- I. The appeal lies from the decision of the examining division to refuse European patent application No. 99 310 458.7. The decision was dispatched on 31 March 2006 and followed a request of the applicant to have a decision according to the state of the file. It makes therefore only reference to two previous communications of the examining division in which it was held, in particular, that the subject-matter of independent claims 1 and 5 then on file did not meet the requirements of the EPC as to clarity (Article 84 EPC 1973), novelty (Article 54(2) EPC 1973) and inventive step (Article 56 EPC 1973).
- II. The notice of appeal was filed on 6 June 2006 and the appeal fee was paid on the same day. The statement setting out the grounds of appeal was filed in due time on 9 August 2006.
- III. The appellant (applicant) requested that the decision of the examining division be set aside, i.e. that a patent be granted on the basis of following application documents:
- claims: 1-9 as filed with letter of 1 December 2004;
description pages: 1-13 as originally filed;
drawings sheets: 1/2 - 2/2 as originally filed.
- Oral proceedings were requested in the event that the Board intended to confirm the impugned decision.
- IV. A summons to attend oral proceedings scheduled to take place on 18 August 2009 was issued.

In a communication pursuant to Article 15(1) Rules of Procedure of the Boards of Appeal (RPBA) issued on 28 April 2009, the Board indicated that it was inclined to share the view of the examining division with regard to the objection of lack of clarity of independent claims 1 and 5. Concerns were also expressed regarding the compliance of independent claims 1 and 5 with the requirements of Article 56 EPC 1973 and the compliance of dependent claim 4 with the dispositions of Article 123(2) EPC.

With particular regard to the objection of lack of clarity, the Board held that the additional features recited in dependent claims 2 and 6 would have clarified the concept of "knee points" in independent claims 1 and 5, respectively. Furthermore, in the Board's view, the indications contained in the description as to the criteria to be used for establishing the form of the color mapping function and the analyzing steps to be carried out constituted essential features of the claimed system and method which should have been specified in the independent claims.

- V. The oral proceedings were cancelled following a corresponding request of the appellant filed by facsimile on 25 June 2009.

Although the appellant confirmed the request to have a decision taken on the case, no comments or submissions addressing the observations of the Board in its communication of 28 April 2009 were made.

VI. Independent claim 1 of the sole request reads as follows:

"1. A system for imaging biological tissues, comprising:

an ultrasound transducer array (2) comprising a multiplicity of transducer elements;

a transmit beamformer (4) for pulsing said transducer array to transmit ultrasound beams in a scan plane;

a receive beamformer (4) for forming receive beams of acoustic data derived from echo signals detected by the transducer array (2) subsequent to said transmissions;

a signal processing chain (6, 8, 10, 12, 14) for converting said acoustic data into an image frame of power Doppler imaging data, characterized by:

a video processor (16) for color mapping said power Doppler imaging data in accordance with a current color mapping function having upper and lower knee points;

an operator interface (24) for selecting a change in the position of at least one of said upper and lower knee points (A, B);

a computer (22) programmed to construct a new color mapping function as a function of said selected change in position and load said new color mapping function into said video processor (16); and

a display device (18) for displaying an image representing a color-mapped image frame of power Doppler imaging data."

Independent claim 5 relates to a method and reads as follows:

"5. A method for programming an ultrasound imaging system, comprising the steps of:

- acquiring successive image frames of power Doppler imaging data;
- storing a current color flow mapping function;
- color mapping said successive image frames of power Doppler imaging data in accordance with said current color mapping function;
- analyzing at least one image frame of power Doppler imaging data, characterized by:
 - determining the positions of lower and upper knee points (A, B) as a function of the results of said analyzing step;
 - constructing a new color mapping function having lower and upper knee points (A, B) at said determined positions; and
 - storing said new color mapping function in place of said current color mapping function."

Claims 2 to 4 and 6 to 9 depend, respectively, on independent claims 1 and 5.

VII. The appellant's arguments submitted in support of its request in the statement of grounds, insofar as they relate to the lack of clarity objected to by the examining division, can be summarized as follows:

The term "knee point", was clearly defined in the description which included multiple references to such knee points. It derived from these various references in the description that the "knee points" were defined

as locations of choice and movable either by an operator or by computer programming to set various ranges for imaging based on the power Doppler imaging data.

VIII. In the context of this decision, reference is made to the provisions of the EPC 2000, which entered into force as of 13 December 2007, unless the former provisions of the EPC 1973 still apply to pending applications. Reference is made in this respect to the transitional provisions defined in Article 7(1) of the Revision Act dated 29 November 2000 (cf. EPC page 492) and the decisions of the Administrative Council dated 28 June 2001 (cf. EPC page 497) and 7 December 2006 (cf. OJ EPO 2007, Special Edition No. 1, 89). Where the former version of the EPC applies, the citation of Articles or Rules is followed by the indication "1973" (cf. EPC, page 4, "citation practice").

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 EPC 1973 and Rule 64 EPC 1973. It is, thus, admissible.
2. *Clarity - Article 84 EPC 1973*
 - 2.1 The reference in independent claims 1 and 5 to a current color mapping function having upper and lower knee points is not clear because the term "knee point" does not have any generally recognised meaning in the field of image processing. The Board does not accept, in this respect, the appellant's argument that a

definition of this term in the description suffices to render the definition of the claimed subject-matter clear; as a general principle, the meaning of the terms of a claim should be clear from the wording of the claim alone.

As already stated in a previous decision of the present Board (in a different composition), "The Board is aware of the jurisprudence which acknowledges that an exception to this principle may exist in situations in which a patent description would provide unambiguous definitions of certain terms and would also make clear that such definitions apply throughout the complete application, so that, when interpreting the wording of claims, the patent specification would constitute its own dictionary" (cf. T 1271/05, point 4.3, not published). The Board observes, however, that these conditions are not met under the present circumstances since the current description does not contain any statement which would imply that the term "knee point" should be given a specific meaning applying throughout the entire application.

The passage on page 9, line 23-33 of the original application, referred to by the appellant in the statement of grounds, merely refers, in association with Figure 3, to one particular illustration of a color mapping function having upper and lower knee points. It fails, however, as such, to give a clear statement which could be identified as a definition.

The following passages of the description on page 9, line 33 to page 10, line 34, admittedly, provide additional information as to the parameters which

enable a determination of said knee points. Similarly, the passage on page 3, line 30 to page 4, line 32, suggests that the knee points constitute specific points of the color mapping function fulfilling certain conditions. In addition, the indications in dependent claims 2 and 6 regarding the form of the color mapping function could be regarded as an alternative definition of the concept of "knee points" within the meaning of the present application.

However, the description does not specify whether any of these various indications should apply to the entire application. Instead, the passage on page 11, lines 12-18, also cited by the appellant, discloses that the positions of the knee points can, alternatively, be determined by the host computer based on user selected inputs such as, for example, the system color flow gain setting or the dynamic range setting. This non-exhaustive list of parameters suggests in effect that any parameter indirectly relating to the Doppler imaging data could be validly relied on to define knee points.

The passage on page 12, lines 4-32, adds to the confusion in that it specifies that the knee points could be moved by the user through the operator interface by moving a graphical symbol to a selected position. In the absence of any limitation as to these selected positions, this embodiment suggests that the knee points can be selected in an essentially arbitrary manner, i.e. even without consideration of the parameters previously referred to.

As a consequence, the Board is unable to recognize a unique and unambiguous definition of the term "knee point" in the description which would also apply to the claims. It is hence not possible, in line with decision T 1271/05, to associate to the features of the lower and upper knee points recited in independent claims 1 and 5 any specific meaning which would distinguish said points from any point defined by the color mapping function.

- 2.2 The aspect regarding the definition of the knee points is considered essential under the present circumstances in view of the technical problem which the claimed invention intends to solve. As indicated on page 3, lines 17-28, of the original application, the mapping functions known from the prior art *"do not allow the user or the system to optimize the image information"*. The solution of this problem resides in the selection of a color mapping function having the optimal form (cf. original application, page 3, line 30 - page 4, line 15), which form presents a segment of increased slope in order to better visualize the actual distribution of power densities for a predetermined range of Doppler flow powers.

This finding implies that essential information for the definition of the claimed system and method is lacking from independent claims 1 and 5. More specifically, the information as to the criteria to be used for establishing the optimal form and to determine the analyzing steps to be made are missing from independent claims 1 and 5, respectively. The only concrete information in this respect appears to be derivable from the passages on page 3, line 30 to

page 4, line 15, and page 9, line 23 to page 10, line 14, of the original application.

- 2.3 A further lack of clarity concerns independent claim 5. The indication "a method for programming an ultrasound system" is misleading as regards the nature of the claimed method, given the fact that the method steps claimed concern exclusively a method of operating an ultrasound imaging system.

The argument put forward by the applicant in the course of the examination proceedings that the method of programming of claim 5 resulted in the system being programmed with the new color map as determined in the preceding steps of the method, does not convince the Board. In fact, the claimed steps describe the course of operations of an algorithm which is already implemented in the ultrasound imaging system in order to generate an essential operating parameter of said ultrasound imaging system, namely, the new color mapping function. The sequence of steps actually recited in independent claim 5 cannot thus be equated with a programming process, which purpose is instead to load said algorithm into the ultrasound system.

- 2.4 For the reasons developed above, the Board concludes that the requirements of Article 84 EPC 1973 as to clarity are not met.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

R. Schumacher

B. Schachenmann