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Datasheet for the decision of 6 December 2011

Case Number: T 2262/08 - 3.2.02

Application Number: 01925056.2

Publication Number: 1274343

IPC: A61B 5/00

Language of the proceedings: EN

Title of invention:
Pulse oximeter sensor with piece-wise function

Applicant:
Nellcor Puritan Bennett Inc.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty and inventive step (yes; after amendment)"

Decisions cited:
-

Catchword:
-

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Case Number: T 2262/08 - 3.2.02

D E C I S I O N
of the Technical Board of Appeal 3.2.02
of 6 December 2011

Appellant: (Applicant)
Nellcor Puritan Bennett Inc.
IP Legal
60 Middletown Avenue
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CT 06473 (US)

Representative:
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Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 12 June 2008 refusing European patent application No. 01925056.2 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: P. L. P. Weber
Members: M. Stern
M. J. Vogel

Summary of Facts and Submissions

I. The applicant lodged an appeal, received on 11 August 2008, against the decision of the Examining Division dispatched on 12 June 2008 refusing application No. 01 925 056.2. The fee for appeal was paid on the same day. A statement setting out the grounds of appeal was received on 9 October 2008.

II. In its decision, the Examining Division had refused the application for lack of novelty over document

D1: US-A-4 942 877,

and presented additional remarks concerning the requirement of Article 123(2) EPC, as well as novelty and inventive step having regard to document

D2: WO-A-93/06 775.

III. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of a main request or, alternatively, on the basis of an auxiliary request. Additionally the appellant requested the reimbursement of the appeal fee.

IV. The Board presented its provisional opinion in a communication dated 16 September 2011.

V. In response, the appellant submitted with letters of 1 and 3 November 2011 an amended set of claims and amended pages of the description. The appellant requested that the decision under appeal be set aside

and that a patent be granted on the basis of the following main request:

- claims 1 to 4 and description pages 4 and 9 as filed with letter of 1 November 2011;
- description pages 2, 3, and 5 as filed with letter of 3 November 2011;
- description pages 1 and 6 to 8 and figure sheets 1/4 to 4/4 of the application as originally filed.

Subject to the application being allowed on the basis of the aforementioned documents, the appellant withdrew all previous requests on file, including that for reimbursement of the appeal fee.

VI. Claim 1 of the main request reads as follows:

"An oximeter system comprising:

an oximeter sensor comprising a light emitter for directing light at a patient; a light detector mounted to receive light from said patient; and a memory storing coefficients for use in functions for determining oxygen saturation and storing a breakpoint oxygen saturation value, said coefficients including at least a first set of coefficients and a second set of coefficients, wherein the first and second sets of coefficients correspond to different oxygen saturation ranges each described by a different function, and wherein one of the sets of coefficients corresponds to a non-linear function for low saturation values below said breakpoint oxygen saturation value; and

an oximeter in communication with said oximeter sensor for receiving said plurality of coefficients and said breakpoint oxygen saturation value and a light

detector signal, said oximeter being programmed to determine oxygen saturation from said light detector signal by fitting said oxygen saturation to one of said functions defined by said sets of coefficients stored in said memory."

Claims 2 to 4 are dependent claims.

Reasons for the Decision

1. The appeal is admissible.

2. Amendments

Claim 1 is based on an oximeter system as defined in original independent claim 24, wherein the features of the oximeter sensor are defined in original independent claim 11, and the features related to the programming of the oximeter for calculating oxygen saturation are disclosed on original page 3, lines 18-28 and original page 4, lines 1-3. Consequently, claim 1 satisfies the requirement of Article 123(2) EPC.

3. Inventive step

3.1 The closest prior art is document D1, which is cited in the paragraph bridging pages 1 and 2 of the application as filed. D1 discloses an oximeter system comprising an oximeter sensor which comprises a light emitter for directing light at a patient, and a light detector for receiving light from said patient (column 3, lines 15 to 19), and a memory storing calibration coefficients which are used by the oximeter in a function for

determining the oxygen saturation (column 12, lines 6 to 14; column 5, lines 38 to 47). That is, the oximeter processor calculates oxygen saturation using said set of calibration coefficients in one and the same function (equation (5) on column 5, line 42).

3.2 The system defined in claim 1 differs from D1 in that it provides the sensor memory with two sets of coefficients corresponding to different oxygen saturation ranges each described by a different function, wherein one of the sets of coefficients corresponds to a non-linear function for low saturation values below a breakpoint oxygen saturation value which is also stored in the sensor memory, and the oximeter is programmed to determine the oxygen saturation from the light detector signal by fitting said oxygen saturation to one of said functions defined by the sets of coefficients stored in the memory.

The system defined in claim 1 is consequently novel over D1.

3.3 The aforementioned differentiating features overcome the problem that the functional relationship between the true arterial oxygen saturation and the measured signals may not fit a single function over the entire span of the measurement range, as indicated on page 3, lines 12 to 22 of the application as filed. The fact that the coefficients for each function as well as the breakpoint saturation value for application of the corresponding function are stored in the sensor memory allows the oximeter to recognise the particular sensor's characteristics (e.g. the light emitter wavelengths) and to determine oxygen saturation

accordingly, as indicated on page 7, line 34 to page 8, line 5 of the application.

3.4 Document D2 relates to an extracorporeal blood circuit through which blood is pumped and oxygenated during surgery (page 1, lines 4 to 7). The circuit comprises a module for calculating oxygen saturation in blood passing through the blood circuit using sets of coefficients (normalisation factors) stored in a memory (page 28, lines 20 to 23), wherein different sets of coefficients correspond to different oxygen saturation ranges each described by a different function depending on breakpoint oxygen saturation values (page 36, lines 1 to 5; Figure 8A). The memory, however, is comprised within an electronic module (3; see Figure 1) which houses not only the light emitters (20, 22, 24) and a light receiver (258) (cf page 19, lines 7 to 24; Figure 6A), but also the oximeter processor (CPU 270; page 18, lines 10 to 12; Figure 6A).

Hence, D2 fails to provide an oximeter sensor which is capable of directing light at a patient and of receiving light from said patient and which includes a memory with sets of coefficients and breakpoint oxygen saturation values, and D2 fails to provide the oximeter processor as a device constituent which is separate from the oximeter sensor, as in the system of claim 1. D2 moreover does not provide any suggestion that the disclosed extracorporeal oxygen saturation determination could also be used in an arterial oximeter with a sensor directly applied onto the patient as in D1, and, a fortiori, it would have not been obvious to include the different sets of coefficients as well as the breakpoint oxygen

saturation values within the memory of the sensor directly applied onto the patient.

The remaining documents on file are of lesser relevance.

3.5 In the Board's judgment, therefore, the system defined in claim 1 satisfies the requirement of novelty and inventive step within the meaning of Articles 54 and 56 EPC.

4. In view of the allowability of the main request, all other requests submitted during the proceedings, including the request for reimbursement of the appeal fee, are considered withdrawn (see point V above, last paragraph).

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

   - claims 1 to 4 and description pages 4 and 9 as filed with letter of 1 November 2011;
   - description pages 2, 3, and 5 as filed with letter of 3 November 2011;
   - description pages 1 and 6 to 8 and figure sheets 1/4 to 4/4 of the application as originally filed.

The Registrar: The Chairman:

D. Hampe P. L. P. Weber