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Datasheet for the decision of 11 January 2007

Case Number: T 0499/04 - 3.2.05

Application Number: 96928788.7

Publication Number: WO 96/33657

IPC: A61B 8/08

Language of the proceedings: EN

Title of invention:
Apparatus and method for acoustic analysis of bone using optimized functions of spectral and temporal signal components

Applicant:
METRA BIOSYSTEMS, INC.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 84
EPC R. 67

Keyword:
"Clarity (no)"
"Reimbursement of appeal fee (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0499/04 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 11 January 2007

Appellant (applicant): METRA BIOSYSTEMS, INC.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 20 November 2003 refusing European application No. 96928788.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: W. Zellhuber
Members: W. Widmeier
M. Vogel

Summary of Facts and Submissions

I. The appellant (applicant) lodged an appeal against the decision of the Examining Division refusing European patent application 96 928 788.7.

The Examining Division held in its decision that the application did not meet the requirements of Article 54 EPC.

II. Oral proceedings before the Board of Appeal were held on 11 January 2007 in the absence of the appellant. The appellant had informed the Board on 11 December 2006 that he did not intend to be represented at the oral proceedings.

III. The appellant requested in writing that the decision under appeal be set aside and that a patent be granted in the following version:

(i) main request: claims 1 to 35, filed as main request; or

(ii) first auxiliary request: claims 1 to 23, filed as first auxiliary request; or

(iii) second auxiliary request: claims 1 to 33, filed as second auxiliary request; or

(iv) third auxiliary request: claims 1 to 35, filed as third auxiliary request,

all submitted on 19 March 2004.

The appellant further requested that the appeal fee be reimbursed.

IV. Claims 1 to 3 of the main request read as follows:

"1. An apparatus for externally determining in a vertebrate subject an index of porosity and non-connectivity of a bone disposed within a body part, the apparatus comprising:
(a) first and second transducers (12, 13), at least one of the transducers employing a vibrating element that is sufficiently small as to cause said at least one transducer, if driven by a signal generation arrangement, to produce an acoustical output that is substantially like that of a point source;
(b) a mounting arrangement (103) for mounting the transducers in spaced relationship with respect to the bone;
(c) a signal generator (11), in communication with the first transducer, for causing the first transducer to produce an acoustic signal, having energy distributed over a frequency range, that is propagated into the subject and received by the second transducer along a first path that includes the bone; and
(d) a signal processor (15), in communication with the second transducer, for providing a measurement that is a function of at least one of spectral or temporal components of a portion, up to the whole amount thereof, of the acoustic signal received by the second transducer, so that the measurement relates to the extent of non-connectivity and porosity of the bone."

"2. An apparatus according to claim 1, wherein the function includes at least one selected portion, to the

exclusion of the entire duration, of the acoustic signal received by the second transducer."

"3. An apparatus according to claim 2, wherein the function includes a selected early portion only of the acoustic signal received by the second transducer."

Claim 1 of the first auxiliary request reads as follows:

"1. An apparatus for externally determining in a vertebrate subject an index of porosity and non-connectivity of a bone disposed within a body part, the apparatus comprising:
(a) first and second transducers (12, 13);
(b) a mounting arrangement (103) for mounting the transducers in spaced relationship with respect to the bone;
(c) a signal generator (11), in communication with the first transducer, for causing the first transducer to produce an acoustic signal, having energy distributed over a frequency range, that is propagated into the subject and received by the second transducer along a first path that includes the bone; and
(d) a signal processor (15), in communication with the second transducer, for providing a measurement that is a function of at least one of spectral or temporal components of a selected portion, up to the whole amount thereof, of the acoustic signal received by the second transducer, so that the measurement relates to the extent of non-connectivity and porosity of the bone, the function based upon at least one of:
(i) a measure of the variability of the Hilbert frequency function of a selected early portion of the signal received,

(ii) a measure of an average of the Hilbert frequency function of a selected early portion of the signal received,

(iii) an estimate of an average Hilbert frequency function of a selected early portion of the signal received,

(iv) a measure of a Hilbert envelope of the signal received,

(v) an autoregressive moving average spectral estimation function of the signal received,

(vi) a weighted sum of spectral components, determined using a short-time Fourier transform, and determined at successive intervals, of the signal received, wherein successive weighted sums associated with the successive intervals are themselves formed into a weighted sum,

(vii) a measure of a group delay of the signal received,

(viii) a measure of a normalized ratio of narrow-band energy to broad-band energy of the signal received,

(ix) a measure of a shape of a Burg function of the signal received, and

(x) a weighted sum of a plurality of functions of at least one of transient spectral and transient temporal components of the acoustic signal received by the second transducer, and the weights have been previously selected for their ability to minimize differences among successive measurements taken of the same individual and to maximize differences in measurements taken of different individuals."

Claim 1 of the second auxiliary request reads as follows:

"1. An apparatus for externally determining in a vertebrate subject an index of porosity and non-connectivity of a bone disposed within a body part, the apparatus comprising:
(a) first and second transducers (12, 13);
(b) a mounting arrangement (103) for mounting the transducers in spaced relationship with respect to the bone;
(c) a signal generator (11), in communication with the first transducer, for causing the first transducer to produce a transmitted burst, having acoustic energy distributed over a frequency range, that is propagated into the subject and received by the second transducer along a first path that includes the bone; and
(d) a signal processor (15), in communication with the second transducer, for providing a measurement that is a function of an early portion of the received burst, so that the measurement relates to the extent of non-connectivity and porosity of the bone."

Claim 1 of the third auxiliary request reads as follows:

"1. An apparatus for externally determining in a vertebrate subject an index of porosity and non-connectivity of a bone disposed within a body part, the apparatus comprising:
(a) first and second transducers (12, 13);
(b) a mounting arrangement (103) for mounting the transducers in spaced relationship with respect to the bone;
(c) a signal generator (11), in communication with the first transducer, for causing the first transducer to produce a transient acoustic signal, having energy distributed over a frequency range, that is propagated

into the subject and received by the second transducer along a first path that includes the bone; and
(d) a signal processor (15), in communication with the second transducer, for providing a measurement that is a function of at least one of spectral or temporal components of a selected portion, up to the whole amount thereof, of the acoustic signal received by the second transducer, so that the measurement relates to the extent of non-connectivity and porosity of the bone."

The wording of claims 2 and 3 of the third auxiliary request is identical to the wording of claims 2 and 3 of the main request.

V. As concerns reimbursement of the appeal fee the appellant argued essentially as follows:

The Examining Division committed a first procedural violation in that it held oral proceedings after only a single communication to which the appellant gave a bona fide response, and a second procedural violation in that it failed to carry out an examination of at least claims 4 to 19, 21 to 30 and 32 to 33 then on file. Reimbursement of the appeal fee is therefore justified.

VI. In a communication annexed to the summons for oral proceedings the Board raised objections, among others, under Article 84 EPC (lack of clarity). These concerned the expression "early portion". The appellant did not comment on these objections. On 11 December 2006 he gave notice that he did not intend to make any further written submissions.

Reasons for the Decision

1. *Lack of clarity, Article 84 EPC*

Claim 3 of the main request, claim 1 of the first and second auxiliary requests, and claim 3 of the third auxiliary request comprise the expression "early portion" of the received signal. However, these claims, or, if the case, the preceding claims, do not define what has to be understood by an "early portion" of a received signal. Neither in the general technical field of electricity nor in the technical field of signal analysis the term "early portion" is of a specific meaning with respect to a time or sub-period within the period of a signal. Thus, from the wording of the claims, it is not clear when a portion of the received signal is an early portion and when it is not.

The description of the application refers in a likewise general manner on page 3, lines 23 and 24, to an "early portion". On page 10, lines 8 and 9, and on page 20, lines 23 and 24, of the application, reference is made to Figure 20 which is supposed to show an early portion of the received signal. However, neither Figure 20 nor the corresponding description of this Figure on page 20, line 25, to page 21, line 6, of the application, give an instruction of what is an early portion and what is not an early portion. A specific time in combination with the term "early portion" is only mentioned on page 20, lines 6 and 7, of the application (3 or 4 microseconds). However, this passage relates to one embodiment and is therefore only an example. As stated on page 7, paragraph 21, of the declaration of

Jeffrey H. Goll, which was submitted by the appellant in the appeal procedure in support of his arguments as to novelty and inventive step, the segment of the waveform (received signal) to be selected as an early portion may be fixed or may depend on the properties of the waveform and varies from subject to subject. Thus, the example described on page 20 of the application cannot be seen as a general rule for an "early portion" of the received signal. Consequently, a person skilled in the art cannot determine, when considering an apparatus for measuring the porosity and non-connectivity of a bone, whether or not the signal analysis performed therein is the same or is different from the signal analysis performed according to one of the above mentioned claims.

It follows that the claims comprising the term "early portion" do not therefore meet the requirement of Article 84 EPC that a claim shall be clear.

As any set of claims submitted by the appellant as main request and first to third auxiliary requests comprises such a claim, none of the requests of the appellant is allowable.

2. *Reimbursement of the appeal fee*

After receiving the appellant's response to the first communication of the examination procedure the Examining Division presumably held that the application still was not ready for grant so that it had a choice between either to issue a further communication or to summon for oral proceedings as requested as an auxiliary measure by the appellant in said response.

This choice was a matter within the discretion of the Examining Division.

The set of claims on which the first communication of the Examining Division was based comprised six independent apparatus claims, contrary to Rule 29(2) EPC. Thus, it was not expedient at that time to examine all of the claims then on file.

The Board has therefore come to the conclusion that the Examining Division did not commit a procedural violation, let alone a substantial one.

According to Rule 67 EPC, the appeal fee is to be reimbursed if the Board deems the appeal to be allowable and if the reimbursement is equitable due to a substantial procedural violation. As both is not the case, the request of the appellant that the appeal fee shall be reimbursed is therefore to be rejected.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Meyfarth W. Zellhuber