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**Datasheet for the decision
of 8 April 2016**

Case Number: T 2205/12 - 3.4.02

Application Number: 01959449.8

Publication Number: 1307135

IPC: A61B5/00

Language of the proceedings: EN

Title of invention:

SYSTEMS AND METHODS FOR PROVIDING INFORMATION CONCERNING
CHROMOPHORES IN PHYSIOLOGICAL MEDIA

Applicant:

Photonify Technologies, Inc.

Relevant legal provisions:

EPC 1973 Art. 84
RPBA Art. 12(4)

Keyword:

Claims - clarity - main request, second and fourth auxiliary
request (no)
Admissibility of first and third auxiliary request (no) - not
admitted in the first-instance proceedings



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Case Number: T 2205/12 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 8 April 2016

Appellant: Photonify Technologies, Inc.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted on 27 March 2012 refusing European patent application No. 01959449.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman F. J. Narganes-Quijano
Members: A. Hornung
T. Karamanli

Summary of Facts and Submissions

- I. The applicant (appellant) lodged an appeal against the decision of the examining division refusing European patent application No. 01959449.8 on the basis of Article 97(2) EPC because the main request then on file did not fulfil the requirements of Articles 54(1), (2) and 56 EPC. The sets of claims of the first and third auxiliary requests then on file were *inter alia* not admitted into the proceedings under Rule 137(3) EPC. The set of claims of the second auxiliary request then on file was *inter alia* not admitted into the proceedings under Rule 137(5) EPC. In addition, the claims of the auxiliary requests were found to lack clarity and to relate to subject-matter for which no search was carried out.

- II. With the statement setting out the grounds of appeal the appellant has filed sets of claims according to a main and first to fourth auxiliary requests, wherein the main and first to third auxiliary requests are identical to the corresponding requests underlying the appealed decision. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of one of these sets of claims.

- III. In a communication annexed to the summons to oral proceedings the board gave a preliminary assessment of the appellant's case on appeal. In particular, as regards the main request the board raised a series of issues under Article 84 EPC 1973 and maintained the objection of lack of novelty raised by the examining division in its decision; as regards the first auxiliary request the board raised the issue of the admissibility of the request *inter alia* under Article 12(4) RPBA; as regards the second auxiliary request the board raised issues under Article 84 EPC 1973 and Article 123(2) EPC in respect to the claimed subject-matter;

as regards the third auxiliary request the board raised the same issue of the admissibility of the request already raised in respect of the first auxiliary request and also raised issues under Article 84 EPC 1973 and Article 123(2) EPC; and as regards the fourth auxiliary request the board raised issues under Articles 84 and 54(1) EPC 1973.

IV. The appellant informed the board with letter dated 6 April 2016 that it would not be attending the oral proceedings.

Oral proceedings were held on 8 April 2016 in the absence of the duly summoned appellant. At the end of the oral proceedings the board announced its decision.

V. Claims of the requests

(a) Independent claim 1 according to the main request reads as follows:

"A system for determining concentrations of chromophores in a physiological medium, comprising:

a source module for irradiating into said medium at least two sets of electromagnetic radiation having different wave characteristics, each set of electromagnetic radiation having a substantially identical amplitude over a measurable period;

a detector module for detecting electromagnetic radiation transmitted through said medium; and

a processing module for determining an absolute value of at least one of said concentrations of chromophores from electromagnetic radiation irradiated from the source module and detected by the detector module,

wherein said determination is based on intensity measurements of continuous wave electromagnetic radiation from the source module."

(b) Independent claim 1 according to the first auxiliary request reads as follows:

"A system for determining concentrations of chromophores in a physiological medium, comprising:

a source module configured in operation to irradiate into said medium at least two sets of electromagnetic radiation having different wave characteristics each set of electromagnetic radiation comprising continuous wave electromagnetic radiation of non-impulsive electromagnetic waves having at least substantially identical amplitude over a measurable period;

a detector module for detecting electromagnetic radiation transmitted through said medium; and

a processing module for determining an absolute value of at least one of said concentrations of chromophores from electromagnetic radiation irradiated from the source module and detected by the detector module,

wherein said determination is based on intensity measurements of continuous wave electromagnetic radiation from the source module,

wherein the continuous wave electromagnetic radiation comprises at least a single step having a duration longer than a temporal sensitivity threshold of the detector module; and

the processing module determines temporal distribution of the determined absolute value of at least one of said concentrations of chromophores."

(c) Independent claim 1 according to the second auxiliary request reads as follows:

"A system for determining concentrations of chromophores in a physiological medium, comprising:

a source module for irradiating into said medium at least two sets of electromagnetic radiation having different wave characteristics;

a detector module for detecting electromagnetic radiation transmitted through said medium;

a signal analyzer comprising at least one receiving unit that operationally couples with the source module and monitors the characteristics of electromagnetic radiation irradiated thereby; and

a processing module for determining an absolute value of at least one of said concentrations of chromophores from [sic] solely from measurements of the intensities of the electromagnetic radiation irradiated from the source module and the intensities of the electromagnetic radiation detected by the detector module, wherein said determination is based on intensity measurements of continuous wave electromagnetic radiation from the source module."

(d) Independent claim 1 according to the third auxiliary request reads as follows:

"A system for determining concentrations of chromophores in a physiological medium, comprising:

a source module for irradiating into said medium at least two sets of electromagnetic radiation having different wave characteristics;

a detector module for detecting electromagnetic radiation transmitted through said medium;

a signal analyzer comprising at least one receiving unit that operationally couples with a wave source forming part of the source module and monitors the characteristics of electromagnetic radiation irradiated thereby; and that communicates with a wave detector forming part of the detector module and receives therefrom an output signal which represents the distribution of chromophores in a target area of the medium and

a processing module for determining an absolute value of at least one of said concentrations of chromophores solely from measurements of the intensities of the electromagnetic radiation irradiated from the source module and the intensities of the electromagnetic radiation detected by the detector module, wherein said determination is based on intensity measurements of continuous wave electromagnetic radiation from the source module, and said determination is not based on measuring frequency domain parameters of the electromagnetic radiation received from one or more detectors or the response of the medium to an electromagnetic impulse from said source module."

(e) Independent claim 1 according to the fourth auxiliary request reads as follows:

"A system for determining concentrations of chromophores in a physiological medium, comprising:

a source module for irradiating into said medium at least two sets of electromagnetic radiation having different wave characteristics, wherein said source module includes at least first and second wave sources, said wave characteristics include at least one of wavelength, phase angle, harmonics and combinations thereof, thereof, [sic] and at least one of the two sets of electromagnetic radiation is near-infrared electromagnetic radiation;

a detector module for detecting electromagnetic radiation transmitted through said medium, wherein said detector module includes at least first and second wave detectors, wherein the wave sources and wave detectors are configured so that the distance between said first wave source and said first wave detector is substantially similar to that between said second wave source and said second wave detector, and that the distance between said first wave source and said second wave detector is substantially similar to that

between said second wave source and said first wave detector; and

a processing module for determining an absolute value of at least one of said concentrations of chromophores from electromagnetic radiation irradiated from the source module and detected by the detector module, wherein said determination is based on intensity measurements of continuous wave electromagnetic radiation from the source module, wherein:

said processing module determines said absolute value using one or more parameters accounting for optical interaction properties of electromagnetic radiation with said medium,

the processing module uses the mathematical expression:

$$I = \alpha \beta \gamma I_0 \exp \{-B L \delta \sum_i (\epsilon_i C_i) + \sigma\},$$

I_0 is the intensity of electromagnetic waves irradiated by said source module,

I is the intensity of electromagnetic waves detected by said detector module, a [the parameter "a" is interpreted as the parameter " α "; see original claim 17] is a parameter associated with at least one of said source module and medium,

β is a parameter associated with at least one of said detector module and medium,

γ is one of a proportionality constant and a parameter associated with at least one of said source module, detector module, and medium,

B is a parameter accounting for the length of an optical path of electromagnetic waves through said medium and associated with at least one of said source module, detector module, and medium,

L is a parameter accounting for a distance between said source module and said detector module,

δ is one of a proportionality constant and a parameter associated with at least one of said source module, detector module, and medium, ϵ_i is a parameter that is at least one

of a medium extinction coefficient, medium absorption coefficient, and medium scattering coefficient,

C_i is a variable denoting concentration of said i-th chromophore, and

σ is one of a proportionality constant and a parameter associated with at least one of said source module, detector nodule and medium."

Reasons for the Decision

1. Main request - Clarity

Claim 1 lacks clarity for the reason that it attempts to define a system in terms of the result to be achieved, i.e. determining an absolute value of the chromophore concentration, without specifying the features of the system required for achieving this result. Indeed, claim 1 merely defines in general terms two different radiation sources, a detector and a processing unit without any details specifically responsible for providing the claimed result.

The appellant did not provide any counter-argument to this objection which was already raised by the board in its communication annexed to the summons to oral proceedings.

It follows that claim 1 lacks clarity within the meaning of Article 84 EPC 1973.

2. First and third auxiliary requests - Admissibility

2.1 The present first auxiliary request is identical to the first auxiliary request which the examining division did not admit into the examining proceedings under Rule 137(3) EPC.

The appellant made no submission in its statement of grounds of appeal relating to the question of whether or not the examining division exercised its discretion under Rule 137(3) EPC in a reasonable manner. The board sees no reason to call into question that the examining division exercised its discretion under Rule 137(3) EPC in a reasonable manner and also no special reason why this request should exceptionally be admitted into the proceedings for the first time during the appeal proceedings.

Therefore, as already announced as a preliminary opinion in its communication annexed to the summons to oral proceedings, the board, exercising its discretionary power under Article 12(4) RPBA, found it appropriate in the circumstances of the case not to admit the first auxiliary request into the proceedings.

- 2.2 The present third auxiliary request is identical to the third auxiliary request which the examining division did not admit into the examining proceedings under Rule 137(3) EPC. The appellant made no submission in that respect.

For corresponding reasons as given above, the board, as announced as a preliminary opinion in its communication annexed to the summons to oral proceedings, did not admit the third auxiliary request into the proceedings under Article 12(4) RPBA.

- 3. Second auxiliary request - Clarity

- 3.1 Claim 1 lacks clarity for the same reason as claim 1 of the main request (see point 1. above), i.e. claim 1 does not define how the absolute value of the concentration of chromophores is actually obtained.

The features which were added to claim 1 of the second auxiliary request in comparison with claim 1 of the main request are not suitable to overcome this objection because they lack clarity and/or support from the description:

- 3.2 It is not clear in claim 1 what kind of unit (optical unit, electronic unit or any other kind of unit?) is actually referred to by the phrase "a signal analyzer comprising at least one receiving unit". The exact technical function of the signal analyzer and its technical relationship with the other components of the claimed system is obscure, too.
- 3.3 The fact that the absolute concentration is to be obtained according to claim 1 "solely" from measurements of the intensities of the radiation irradiated from the source and the intensities detected by the detector is interpreted so as to imply that claim 1 refers to formulas (12a) and (12b) of page 32 of the description. These formulas are based on "the simplest approach of approximating $F^{\lambda 1}$ and $F^{\lambda 2}$ to be a unity" (cf. the sentence bridging pages 31 and 32). The quantities $F^{\lambda 1}$ and $F^{\lambda 2}$, however, depend on a plurality of features of the system and the physiological medium (see description, page 28, last paragraph, together with page 30, line 11 to page 32, line 13). Claim 1 does not require any specific feature that would allow approximating the quantities $F^{\lambda 1}$ and $F^{\lambda 2}$ as being equal to unity. Consequently, claim 1 is unclear and lacks support from the description within the meaning of Article 84 EPC 1973.
- 3.4 The appellant did not provide any counter-argument to these objections which were already raised by the board in its communication annexed to the summons to oral proceedings.
- 3.5 It follows that claim 1 lacks clarity within the meaning of Article 84 EPC 1973.

4. Fourth auxiliary request - Clarity

- 4.1 Claim 1 lacks clarity for the same reason as claim 1 of the main request (see point 1. above), i.e. claim 1 does not define how the absolute value of the concentration of chromophores is actually obtained.

The features which were added to claim 1 of the fourth auxiliary request in comparison with claim 1 of the main request are not suitable to overcome this objection, in particular because the processing module, which is supposed to determine said absolute value of the concentration of chromophores, uses the following mathematical expression:

$$I = \alpha \beta \gamma I_0 \exp \{-B L \delta \sum_i (\epsilon_i C_i) + \sigma\},$$

which is unclear.

Indeed, the definition of the parameters α , β , γ , B , L , δ and σ is vague and indefinite since, according to claim 1, these parameters, in essence, are merely "associated with" at least one of said source module, detector module or medium in some undefined manner. The two parameters γ and σ are defined with exactly the same words so that their distinctive contributions is indeterminate. Such a general definition does not allow the determination of the numerical values of the corresponding parameters in a concrete system.

Claim 1 was further limited by adding general features of the source module and the detector module, which do also not explain how the absolute value of the concentration of chromophores is obtained.

- 4.2 The appellant did not provide any counter-argument to these objections which were already raised by the board in the annex to the summons to oral proceedings.

4.3 It follows that claim 1 lacks clarity within the meaning of Article 84 EPC 1973.

5. In view of the above, none of the appellant's requests is allowable and, therefore, the board sees no reason to set aside the contested decision.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



M. Kiehl

F. J. Narganes-
Quijano

Decision electronically authenticated