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Datasheet for the decision of 22 May 2015

Case Number: T 1891/11 - 3.4.02

Application Number: 08104421.6

Publication Number: 1998193

IPC: G02B5/20

Language of the proceedings: EN

Title of invention:
Nano-structured Zero-order diffractive filter

Applicant:
CSEM Centre Suisse d'Electronique et de Microtechnique SA - Recherche et Développement

Headword:

Relevant legal provisions:
EPC Art. 83

Keyword:
Sufficiency of disclosure - (no)

Decisions cited:

Catchword:

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Case Number: T 1891/11 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 22 May 2015

Appellant: (Applicant)	CSEM Centre Suisse d'Electronique et de Microtechnique SA - Recherche et Développement Rue Jaquet-Droz 1 P.O. Box 2002 Neuchâtel (CH)
Representative:	GLN SA Avenue Edouard-Dubois 20 2000 Neuchâtel (CH)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 25 February 2011 refusing European patent application No. 08104421.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	L. Bühler
Members:	A. Hornung
	H. von Gronau

Summary of Facts and Submissions

I. The applicant (appellant) has appealed the decision of the examining division refusing European patent application No. 08104421.6 on the basis of Article 83 EPC.

II. The appellant requested that the decision of the examining division be set aside and a patent be granted on the basis of the main request or, alternatively, of auxiliary requests 1 and 2, all requests filed with the statement setting out the grounds of appeal.

As a precaution, the appellant requested oral proceedings.

III. In a communication annexed to the summons to oral proceedings, the board informed the appellant about its provisional and non-binding opinion according to which the European patent application did not disclose the invention underlying any of the requests in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC).

IV. In response to the summons to oral proceedings, the appellant's representatives had informed the board during a telephone conversation on 19 May 2015 that the appellant would not be represented at the oral proceedings. The appellant filed no comments concerning the board's preliminary opinion as annexed to the summons.

V. The oral proceedings were held in the absence of the appellant (Rule 115(2) EPC and Article 15(3) RPBA).

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

"1. A sensor adapted to be either one of fluorescing or phosphorescing, the sensor comprising a zero-order diffractive filter for polarized or unpolarised polychromatic light, the zero-order diffractive filter comprising:
a medium (12) having a low index of refraction n_{low} ; and
a waveguiding layer (11) having a high index of refraction n_{high} ;
the medium (12) and the waveguiding layer (11) being arranged such to form grating lines (10), the grating lines (10) having a period length Λ that is smaller than the wavelength of light for which the filter is designed
characterized in that
the sensor comprises an interface (13, 14) between the low refraction index medium (12) and the waveguiding layer (11) and the medium (12) forming the interface (13, 14),
the medium (12) having a surface that is nanostructured by nanoparticles (3) which incorporate fluorescent or phosphorescent dyes (3),
wherein the waveguiding layer (11) is arranged on the nanostructured surface such that the nanoparticles are embedded in a gradient region of the waveguiding layer (11),
wherein the gradient region corresponds to the interface (13, 14) and has an index gradient pointing traverse to the light propagation direction in the waveguiding layer (11),
wherein the dyes (3) are such to alter their absorption peak and/or fluorescent peak position by interaction with the environment."

Independent claim 1 of the appellant's first auxiliary request reads as follows:

"1. A method for manufacturing a sensor adapted to be either one of fluorescing or phosphorescing, comprising the steps:
- providing grating lines (10) made of a medium (12) forming a first substrate (13);

- depositing a plurality of nanostructures (2) onto the first interface (13), at least some of the nanostructures (2) being implemented by either one of a fluorescing and phosphorescing material (3) able to modify the optical characteristic of a ZOF useable as a sensor with high sensivity; and
- depositing at least one waveguiding layer (11) onto the grating lines (10) and nanostructures (2)) such that the nanoparticles are embedded in a gradient region of the waveguiding layer (11), the waveguiding layer (11) having a higher index of refraction than the medium (12)."

Independent claim 1 of the appellant's second auxiliary request reads as follows:

"1. A method for manufacturing a sensor adapted to be either one of fluorescing or phosphorescing, comprising the steps:
- providing grating lines (10) made of a medium (12) forming a first substrate (13);
- depositing a plurality of nanostructures (2) onto the first interface (13), at least some of the nanostructures (2) being implemented by either one of a fluorescing and phosphorescing material (3); and
- depositing at least one waveguiding layer (11) onto the grating lines (10) and nanostructures (2) such that the nanoparticles are embedded in a gradient region of the waveguiding layer (11), the waveguiding layer (11) having a higher index of refraction than the medium (12)."

Reasons for the Decision

1. Main request

The European patent application does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC).

1.1 Claim 1 defines a "sensor adapted to be either one of fluorescing or phosphorescing", comprising inter alia dyes, "wherein the dyes (3) are such to alter their absorption peak and/or fluorescent peak position by interaction with the environment".

As stated in the appealed decision, point 2.1, "a sensor is per definition necessarily capable of measuring a physical quantity and converting it into a readable output signal and the application as a whole fails to provide any information about which (...) parameter is to be sensed". The original application, page 11, lines 10-12, broadly refers to a "dye [which] alters the absorption and/or fluorescent peak position by interaction with the environment". However, it would appear that absorption and/or fluorescent peak positions are "determined by the molecular structure of the dye and cannot be easily changed" (see point 2.1 of the appealed decision). The other passage in the original application documents mentioning a sensor merely states the possibility of using the zero-order diffraction filter in sensor applications without giving further details (page 15, lines 12-14). Therefore, even in the light of the description, it remains obscure which sensing property is referred to in claim 1 and on which physical properties it is based.

1.2 In its statement setting out the grounds of appeal, page 2, third paragraph, the appellant referred broadly to certain dyes disclosed on page 14, lines 9 to 13. However, it is not clear for the board whether, and if so, how, these dyes alter

the absorption and/or fluorescent peak position by interaction with the environment.

Moreover, the appellant seemed to argue that the property of "small metallic particles [which are] able to have a shift in colour in reaction of light received from environment", as exemplified by the newly introduced document P1 ["Metal nanoparticles as labels for heterogeneous, chip-based DNA detection", Wolfgang Fritzsche et al., Nanotechnology 14 (2003) R63-R73], formed part of the knowledge immediately present to the skilled person reading the application (see the statement setting out the grounds of appeal, page 2, fourth and fifth paragraph).

The board is not able to see a direct link between the disclosure of P1 and the claimed sensor such that the lack of explicit disclosure in the present application would be automatically compensated upon reading the content of P1. P1 describes a very specific biosensor to be used under very specific test conditions, whereas the claimed sensor is only defined in very broad terms in the present application. The biosensor of P1 does not comprise dye nanoparticles embedded within a waveguide as claimed, but surface-bound gold nanoparticles able to react with biomolecules. Furthermore, it cannot be inferred from a single document, i.e. P1, that its content belongs to the common general knowledge immediately present to the skilled person when reading the present application.

1.3 In conclusion, the board is of the opinion that the skilled person lacks information to carry out the invention as claimed because he does not know which parameter is to be sensed and how to select and implement the fluorescent dye underlying the claimed sensor.

2. Auxiliary requests 1 and 2

The European patent application appears not to disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC).

Both auxiliary requests 1 and 2 relate to a method for manufacturing a sensor. However, it is not clear, neither from the wording of the claim, nor from the description, which method steps provide which sensing capacity. Therefore, the invention is not sufficiently disclosed contrary to the requirement of Article 83 EPC. See also the reasons given above in point 1.1.

3. The appellant neither attempted to rebut the board's provisional opinion expressed in the annex to oral proceedings, nor submitted any new requests aiming at overcoming the objections.

4. It follows that the present patent application does not meet the requirements of Article 83 EPC for the reasons set out above.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl L. Bühler

Decision electronically authenticated