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Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

[Continued on next page]

(54) Title: OPTICAL BIOCHIP PLATFORM WITH PLASMONIC STRUCTURE

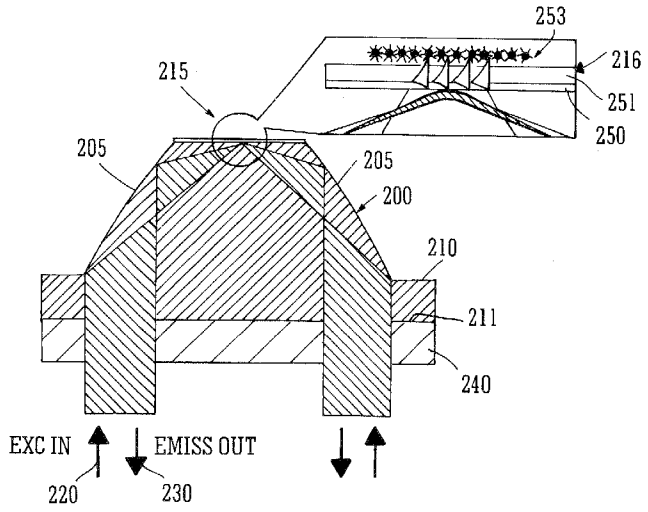

FIG. 2

(57) Abstract: Luminescent sensors which are configured such that operably plasmonic effects contribute to the output of the sensors are described. In a preferred arrangement there is provided a sensor having an optical element which operably effects generation of a luminescence signal for subsequent detection, the optical element being configured such that operably plasmonic effects contribute to at least one of the generation or capture of the luminescence signal. The invention also provides an optical biochip platform with plasmonic structure for detecting fluorescence or other luminescent signals and optical sensor configurations or systems that utilize an optical chip.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
INV. G01N21/55 G01N33/543

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G01N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, INSPEC, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	STRANIK ET AL: "Plasmonic enhancement of fluorescence for sensor applications" SENSORS AND ACTUATORS B, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, vol. 107, no. 1, 27 May 2005 (2005-05-27), pages 148-153, XP005247626 ISSN: 0925-4005 paragraphs [002.], [003.]; figures 1-6	1-16, 18-25, 27,28,30

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 February 2009	03/03/2009

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ONDREJ STRANIK ET AL: "Optimization of Nanoparticle Size for Plasmonic Enhancement of Fluorescence" PLASMONICS, KLUWER ACADEMIC PUBLISHERS-PLENUM PUBLISHERS, NE, vol. 2, no. 1, 29 December 2006 (2006-12-29), pages 15-22, XP019486272 ISSN: 1557-1963 the whole document	1-16, 18-25, 27,28,30
X	US 2005/009198 A1 (MACCRAITH BRIAN [IE] ET AL) 13 January 2005 (2005-01-13) paragraphs [0015] - [0018], [0020], [0028] paragraphs [0031], [0032], [0037], [0044] paragraphs [0126] - [0131]; figures 15-17	1-16, 18-25, 27,28,30
A	DE 196 51 935 A1 (RUCKSTUHL THOMAS [DE]; SEEGER STEFAN PROF DR [DE]) 18 June 1998 (1998-06-18) column 4, line 19 - last line ; figures 1,4 example 1	1-16, 18-25, 27,28,30
A	KRIEG ET AL: "Towards single-molecule DNA sequencing: Assays with low nonspecific adsorption" ANALYTICAL BIOCHEMISTRY, ACADEMIC PRESS INC. NEW YORK, vol. 349, no. 2, 15 February 2006 (2006-02-15), pages 181-185, XP005274783 ISSN: 0003-2697 page 182, column 1, line 5 - column 2, line 8; figure 1	1-16, 18-25, 27,28,30
A	BLUE R ET AL: "Platform for enhanced detection efficiency in luminescence-based sensors" ELECTRONICS LETTERS, IEE STEVENAGE, GB, vol. 41, no. 12, 9 June 2005 (2005-06-09), pages 682-684, XP006024192 ISSN: 0013-5194 page 682, column 2, line 8 - page 683, column 2, line 4; figures 1-3	1-16, 18-25, 27,28,30

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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/060621

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TANG ET AL: "Enzymatically biocatalytic precipitates amplified antibody-antigen interaction for super low level immunoassay: An investigation combined surface plasmon resonance with electrochemistry" BIOSENSORS & BIOELECTRONICS, ELSEVIER SCIENCE PUBLISHERS, BARKING, GB, vol. 23, no. 5, 10 August 2007 (2007-08-10), pages 668-674, XP022345922 ISSN: 0956-5663 available online page 669, column 1, line 41 - column 2, line 44; figure 1 page 670, column 1, line 5 - column 2, line 55; figure 2 figures 4-6	17,26,29
X	US 2004/113077 A1 (FRANZEN STEFAN [US] ET AL) 17 June 2004 (2004-06-17) paragraph [0015] - paragraph [0020] paragraph [0065] - paragraph [0068] paragraph [0076] paragraph [0083] - paragraph [0086]; figures 5A,5B	17,26,29
A	US 6 090 545 A (WOHLSTADTER JACOB [US] ET AL) 18 July 2000 (2000-07-18) column 9, line 40 - line 52 column 47, line 57 - column 48, line 6 column 53, line 50 - line 63	17,26,29
A	PALUMBO M ET AL: "Surface plasmon resonance detection of metal ions: layer-by-layer assembly of polyelectrolyte sensing layers on a multichannel chip" IEEE SENSORS JOURNAL IEEE USA, [Online] vol. 5, no. 6, December 2005 (2005-12), pages 1159-1164, XP002515936 ISSN: 1530-437X Retrieved from the Internet: URL:http://ieeexplore.ieee.org/search/wrapper.jsp?arnumber=1532253> [retrieved on 2009-02-19] abstract; figures 1-6	17,26,29

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2008/060621

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. [X] As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

[X] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-16,18-25,27,28,30

   Sensor caracterized by the arrangement of the optical elements and the light coupling.

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2. claims: 17,26,29

   Sensor characterized by the multilayered structure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2008/060621

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