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(54) Title: MICROELECTRONIC SENSOR DEVICE WITH A MODULATED LIGHT SOURCE

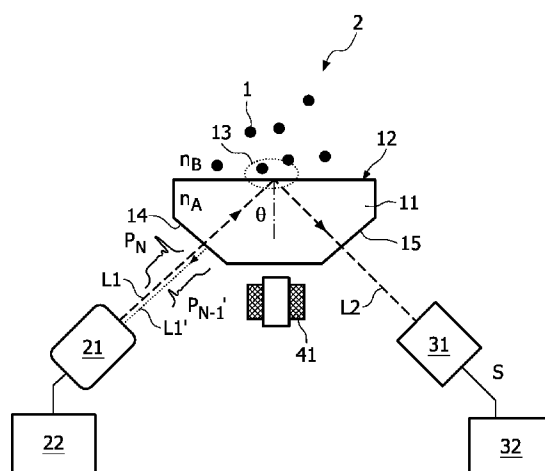


FIG. 1

(57) Abstract: The invention relates to a microelectronic sensor device and a method for making optical examinations at a carrier (11), e.g. for the detection of magnetic particles (1) at a contact surface (12) of the carrier (11) by frustrated total internal reflection (FTIR). A light source (21), particularly a laser light source, with a laser modulator (22) are used for emitting an input light beam (L1) into the carrier (11) which is modulated such that optical interferences with reflections (L1') of the input light beam (L1) from the entrance window (14) or other components of the carrier (11) are reduced/minimized. This can for example be achieved by a pulsed on/off modulation in which the first relaxation minimum of a currently emitted pulse (P_N) coincides in the light source (21) with the first relaxation maximum of a reflected pulse (P_{N-1}'). By reducing the effect of interferences, the setup is less prone to disturbances from dimensional variations that are e.g. induced by thermal extension.

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2008/052869

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01N21/55 G01N33/543 G01N21/64

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

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, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 313 448 A (SUKEDA HIROFUMI [JP] ET AL) 17 May 1994 (1994-05-17) * abstract; col. 4, lines 6-29; col. 5, line 26 to col. 8, line 6; figures 1-3 *	1-6
Y		7
X	STUBKJAER K E ET AL: "NOISE PROPERTIES OF SEMICONDUCTOR LASERS DUE TO OPTICAL FEEDBACK" IEEE JOURNAL OF QUANTUM ELECTRONICS, IEEE SERVICE CENTER, PISCATAWAY, NJ, USA, vol. QE-20, no. 5, 1 May 1984 (1984-05-01), pages 472-478, XP000705638 ISSN: 0018-9197 the whole document	1-3,6
Y		7
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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- *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)
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Date of the actual completion of the international search

20 January 2009

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23/06/2009

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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.
Y	STUBKJAER K, SMALL M B: "Feedback-induced noise in index-guided semiconductor lasers" and its reduction by modulation" ELECTRONICS LETTERS, vol. 19, no. 10, 12 May 1983 (1983-05-12), pages 388-390, XP007906835 * section "Results and discussion" *	7
A	SMALL M B ET AL: "NOISE PROPERTIES OF SEMICONDUCTOR LASERS IN SIMULATED CONDITIONS OF OPTICAL PLAYBACK" TOPICAL MEETING ON OPTICAL DATA STORAGE. MONTEREY, APRIL 18 - 20, 1984; [TOPICAL MEETING ON OPTICAL DATA STORAGE], NEW YORK, IEEE, US, vol. -, 18 April 1984 (1984-04-18), pages FC-A1-1-FC-A1-4, XP000131965 the whole document	1-7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2008/052869

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. ☐ 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.:

1-7

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.
- ☐ 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: 1-7

Modulation of a light source in a sensor device.

2. claims: 8,9,11(in parts)

A carrier.

3. claims: 10,11(in parts)

An electromagnetic actuator for manipulating target particles.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2008/052869

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5313448 A	17-05-1994	JP 5089465 A	09-04-1993