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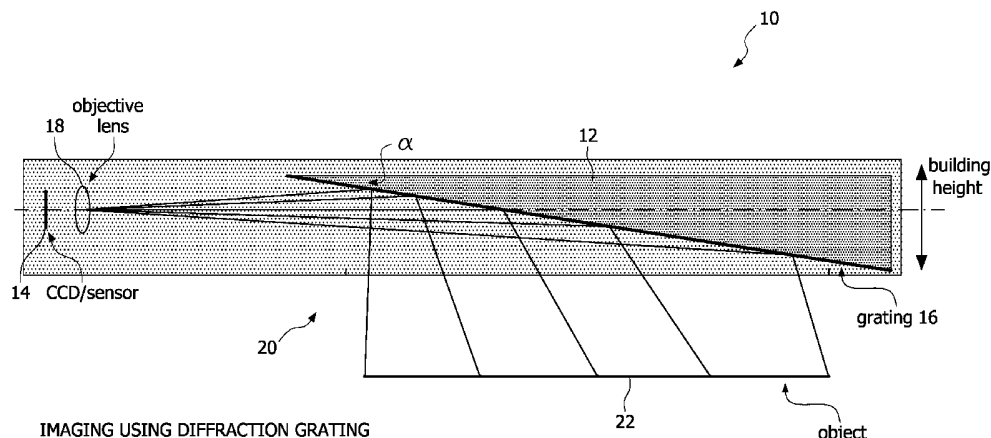
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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(54) Title: OPTICAL DEVICE AND IMAGING METHOD



IMAGING USING DIFFRACTION GRATING

- (57) Abstract: An optical device comprises a body, the body housing a detector, a diffraction grating and a lens for focusing light reflected by the diffraction grating onto the detector. The body is provided with a window, the window for allowing light to pass from outside of the optical device to the diffraction grating. The diffraction grating, in a preferred embodiment, has a variable pitch, to achieve a linear imaging. The lens comprises a low numerical aperture lens, and the detector is aligned at an angle that is non-perpendicular to the optical axis of the imaging lens.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2006/050716

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04N1/03 G02B27/42

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)
H04N G02B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 198 46 363 C1 (LUKOWSKI, KARL-PETER) 20 April 2000 (2000-04-20) figure 1	1,2, 8-10,17 3
Y	----- EP 0 517 235 A (CANON KABUSHIKI KAISHA) 9 December 1992 (1992-12-09) abstract figure 5	3
A	----- EP 0 298 482 A (SHARP KABUSHIKI KAISHA) 11 January 1989 (1989-01-11) column 9, line 50 - column 10, line 36; figure 5	1,10
A	----- EP 0 814 596 A (HEWLETT-PACKARD COMPANY) 29 December 1997 (1997-12-29) page 7, line 53 - page 8, line 7; figures 6b,6c ----- -/--	1,10

☒ Further documents are listed in the continuation of Box C.

☒ 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

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"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

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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.
A	US 6 184 929 B1 (NODA SATOSHI ET AL) 6 February 2001 (2001-02-06) figures 14,20 -----	1,10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2006/050716

Box 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 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 all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers 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.:

see annex

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ 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: 1-4,8-12,16,17

An optical device comprising a body, the body housing a detector, a diffraction grating and a lens for focusing light reflected by the diffraction grating onto the detector wherein the diffraction grating has a variable pitch designed such that linear imaging is achieved

2. claims: 5,13

An optical device comprising a body, the body housing a detector, a diffraction grating and a lens for focusing light reflected by the diffraction grating onto the detector wherein the sum of the exit and entrance angles of the diffraction grating is approximately ninety degrees

3. claims: 6,14

An optical device comprising a body, the body housing a detector, a diffraction grating and a lens for focusing light reflected by the diffraction grating onto the detector wherein the lens comprises a low numerical aperture lens

4. claims: 7,15

An optical device comprising a body, the body housing a detector, a diffraction grating and a lens for focusing light reflected by the diffraction grating onto the detector wherein the detector is aligned at an angle that is non-perpendicular to the optical axis of the lens

5. claims: 18-24

An optical device for imaging an object comprising a body, the body housing a detector, the detection plane substantially at right angles to the object, a variable focus lens for focusing light onto the detector, and means for controlling the focus of the lens

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2006/050716

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