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[Continued on next page]

(54) Title: SINGLE OR MULTI-ENERGY VERTICAL RADIATION SENSITIVE DETECTORS

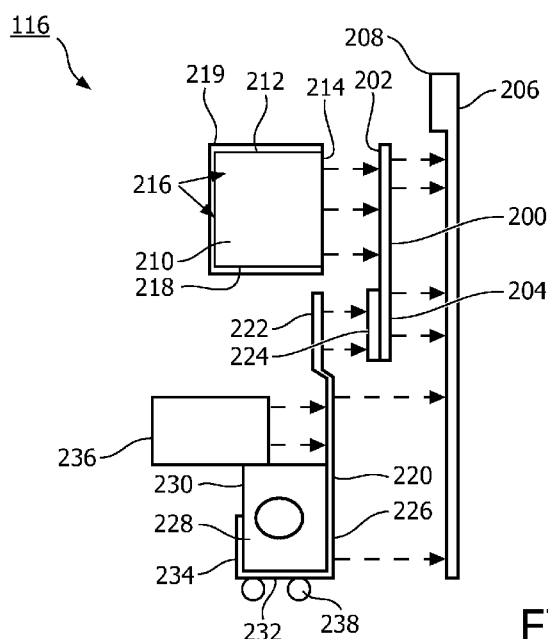


FIG. 2

(57) Abstract: A vertical radiation sensitive detector array (114) includes at least one detector leaf (118). The detector leaf includes a scintillator array (210, 502, 807, 907), including, at least, a top side (212) which receives radiation, a bottom side (218) and a rear side (214) and a photo-sensor circuit board (200, 803, 903), including a photo-sensitive region (202, 508, 803, 903), optically coupled to the rear side of the scintillator array. The detector leaf further includes processing electronics (406) disposed below the scintillator array, a flexible circuit board (220) electrically coupling the photo-sensitive region and the processing electronics, and a radiation shield (236) disposed below the bottom of the scintillator array, between the scintillator and the processing electronics, thereby shielding the processing electronics from residual radiation passing through the scintillator array. Some embodiments incorporate rare earth iodides such as Srl 2 (Eu).



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

17 January 2013

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2012/050426

A. CLASSIFICATION OF SUBJECT MATTER
INV. G01T1/164 G01T1/20
ADD.

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)
G01T

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 practicable, search terms used)

EP0-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/253507 A1 (LEVENE SIMHA [IL] ET AL) 16 October 2008 (2008-10-16) cited in the application paragraphs [0025] - [0038], [0042]; figure 2b -----	1-18
A	US 2007/221858 A1 (ABENAIM DANIEL [US] ET AL) 27 September 2007 (2007-09-27) paragraph [0029]; figure 2 -----	1
A	US 2005/236573 A1 (VOGTMEIER GEREON [DE]) 27 October 2005 (2005-10-27) paragraph [0036]; figure 6 -----	1
A	WO 2010/137396 A1 (HAMAMATSU PHOTONICS KK [JP]; HAYATSU KENZO [JP]; SUGIYA MITSUTOSHI [JP]) 2 December 2010 (2010-12-02) abstract; figure 1 -----	1

☐

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 application or patent 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

11 September 2012

Date of mailing of the international search report

06/12/2012

Name and mailing address of the ISA/

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Authorized officer

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2012/050426

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 all searchable 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 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.:

1-18

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: 1-18

A vertical detector array comprising shielding means.

2. claims: 19-28

A detector array comprising a halide composite scintillator that includes a resin.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2012/050426

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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