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[Continued on next page]

(54) Title: A HETEROGENEOUS CAPTURE-GATED NEUTRON DETECTOR

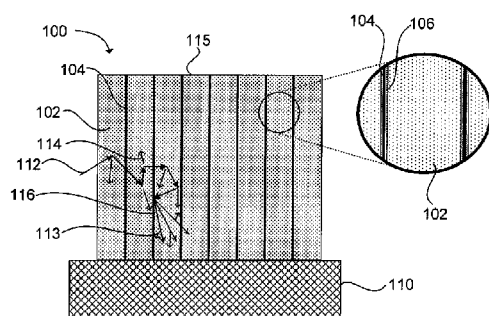


FIG. 1a

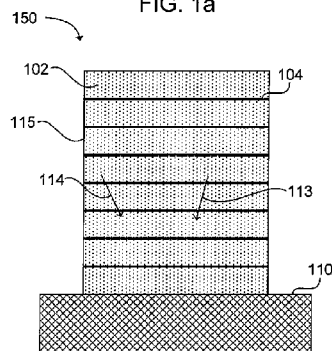


FIG. 1b

(57) Abstract: A system and method for a heterogeneous capture-gated neutron detector are disclosed. The system includes an organic hydrogenous scintillating layer (102) configured to emit at least one collision photon (114) when contacted with a neutron (112) having an energy greater than a predetermined value. A neutron capture layer (104) is located adjacent the organic scintillating layer (102) and configured to capture the neutron (112) and emit at least one gamma ray (116). The organic scintillating layer (102) is further configured to emit at least one capture photon (113) in response to the at least one gamma ray (116) from the neutron capture layer (104). Detection of the collision photon (114) and capture photon (113) designate a detected and captured neutron.



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A. CLASSIFICATION OF SUBJECT MATTER*G01T 3/06(2006.01)i, G01T 1/20(2006.01)i, G01N 23/06(2006.01)i*

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)

IPC: G01T 3/06, 3/00, 1/20, 1/00, G01N 23/06

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

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS (KIPO internal), NDSL

keywords: "neutron detector" "gadolinium", "hydrogenous scintillating" and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5,231,290 A (CZIRR, J. BARTLEY & JENSEN, GARY L.) 27 July 1993 see abstract; column 2, lines 64-65, column 10, lines 40-54 and column 12, lines 3-26; figures 9A and 9B	1-5, 11-23 6-10
X Y	US 2007/0272874 A1 (GRODZINS, LEE) 29 November 2007 see paragraphs [0024]-[0030]; claims 1-7; figure 2	1, 3-19, 21-23 6-10
Y A	Czirr, J. Bart et al., "Capture-gated Neutron Spectrometry", Nuclear Instruments and Methods in Physics Research A, 2002, Vol. 476, pp. 309-312 see the whole document	6-10 1-5, 11-23
X Y	US 4,931,649 A (CZIRR, J. BARTLEY & JENSEN, GARY L.) 5 June 1990 see column 4, line 7 - column 8, line 9; claims 1, 5, 6 and 17; figure 1	1-5, 11-23 6-10
X Y	WILCOX, EVA, "Novel Neutron Detector for n-n Scattering Length", a thesis for the degree of Master of Science, Brigham Young University, Aug. 2005 see pages 12-14	1-5, 11-23 6-10



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

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/030047

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5231290	27.07.1993	NONE	
US 2007-272874 A1	29.11.2007	AU 2007-267904 A1 EP 2021831 A2 US 7525101 B2 WO 2007-139915 A2	06.12.2007 11.02.2009 28.04.2009 06.12.2007
US 4931649 A	05.06.1990	NONE	