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- (71) **Applicant: UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INC.** [US/US]; 223 Grinter Hall, Gainesville, FL 32611 (US).
- (72) **Inventors: KIM, Do, Young;** 5007 N.w. 69th Place, Gainesville, FL 32653 (US). **SO, Franky;** 5014 N.w. 60th Terrace, Gainesville, FL 32653 (US). **LEE, Jae, Woong;** 3724 N.w. 24th Blvd., Apt. #305, Gainesville, FL 32605 (US).
- (74) **Agents: WALSH, Edmund J. et al.;** Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210-2206 (US).
- (81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,

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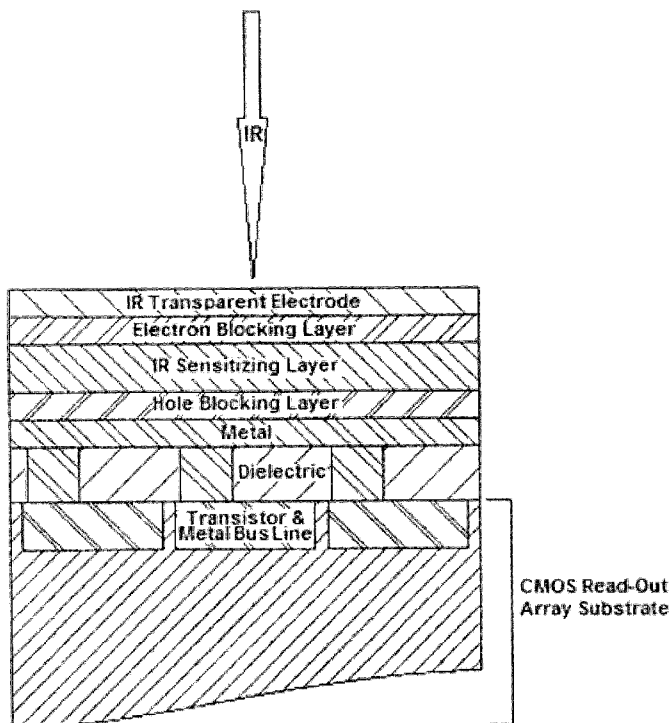
(54) **Title:** A NOVEL IR IMAGE SENSOR USING A SOLUTION PROCESSED PBS PHOTODETECTOR

Figure 2

(57) **Abstract:** An image sensor is constructed on a substrate that is a read-out transistor array with a multilayer array of infrared photodetectors formed thereon. The infrared photodetectors include a multiplicity of layers including an infrared transparent electrode distal to the substrate, a counter electrode directly contacting the substrate, and an infrared sensitizing layer that comprises a multiplicity of nanoparticles. The layers can be inorganic or organic materials. In addition to the electrodes and sensitizing layers, the multilayer stack can include a hole-blocking layer, an electron-blocking layer, and an anti-reflective layer. The infrared sensitizing layer can be PbS or PbSe quantum dots.



MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
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GW, KM, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the
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— *of inventorship (Rule 4.17(iv))*

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A. CLASSIFICATION OF SUBJECT MATTER**H01L 27/146(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)

H01L 27/146; none ; H04N 5/335; H01L 51/52; H01L 29/82; G01N 27/12; H01L 21/00

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

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: IR image sensor, PbS, read-out transistor, anti-reflective layer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2013-003850 A2 (UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INC.) 03 January 2013 See abstract, claims 1-16 and figure 1B.	1-15
Y	US 2010-0302419 A1 (DEN BOER et al.) 02 December 2010 See paragraph [0009], claims 13, 15 and figure 5.	1-15
Y	US 2011-0303906 A1 (GOLDMANN) 15 December 2011 See abstract, paragraphs [0024]-[0025] and figure 1.	10-11
A	WO 2012-178071 A2 (BROWN UNIVERSITY) 27 December 2012 See abstract, claims 1-6 and figures 1A-2B.	1-15
A	US 2006-0157806 A1 (RHODES) 20 July 2006 See abstract, claims 1-3 and figures 2-5.	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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"&" document member of the same patent family

Date of the actual completion of the international search

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Date of mailing of the international search report

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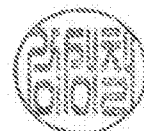
International Application Division
Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan City, 302-701,
Republic of Korea

Facsimile No. +82-42-472-7140

Authorized officer

KANG, Sung Chul

Telephone No. +82-42-481-8405



INTERNATIONAL SEARCH REPORT

Information on patent family members

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