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(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, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, 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, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

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(54) **Title:** A COMBINED SHORT-WAVELENGTH INFRARED AND VISIBLE LIGHT SENSOR

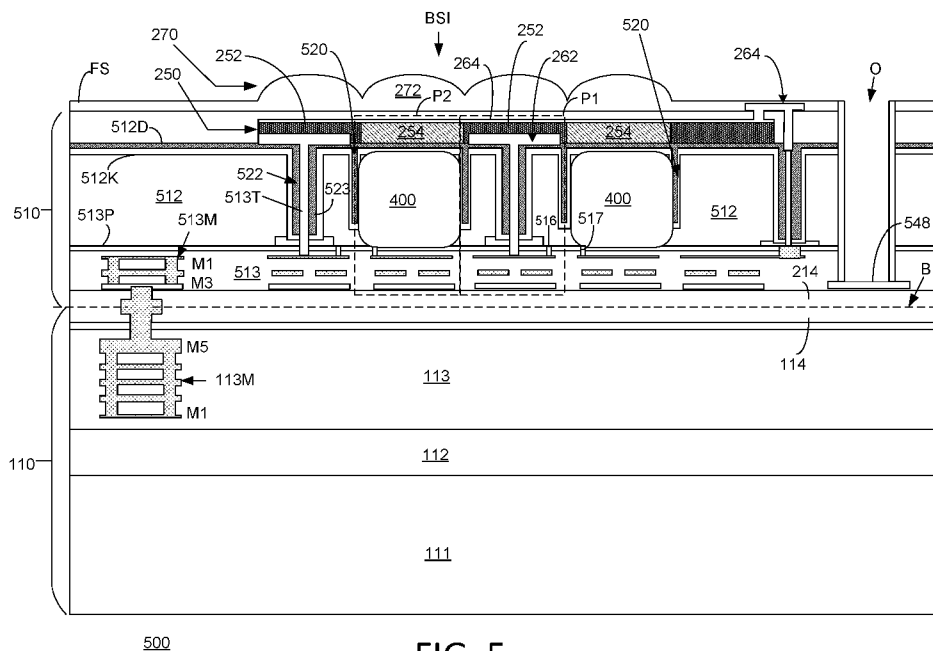


FIG. 5

(57) **Abstract:** A sensor includes an array of optically active pixels disposed on a semiconductor die. The array of optically active pixels includes at least one pixel (P1) configured to detect short wavelength infrared radiation (SWIR), and at least one pixel (P2) configured to detect visible light incident on the sensor.



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## A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. H04N 5/33; G01N 21/35; H01L 27/146 (2023.01)

ADD.

CPC - INV. H04N 23/11; H01L 27/14645; H04N 23/10

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)  
See Search History documentDocumentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
See Search History documentElectronic database consulted during the international search (name of database and, where practicable, search terms used)  
See Search History document

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2018/0035061 A1 (BAE SYSTEMS IMAGING SOLUTIONS INC.) 01 February 2018;	1, 3, 21, and 23
---	Abstract; Paragraph [0013]	---
Y		2, 4-6, 8-20, 22, and 24
Y	US 2022/0085225 A1 (THE UNIVERSITY OF CHICAGO) 17 March 2022; Paragraph [0025], FIG. 1A	2, 10-12, 14-18, and 22
Y	US 2022/0190010 A1 (COHERENT AI LIMITED) 16 June 2022; Paragraph [0002]	4, 12, and 24
Y	US 2006/0055800 A1 (ACKLAND BRYAN D) 16 March 2006; Paragraphs [0015], [0034]; FIGS. 4 AND 5	5, 6, and 14-18
Y	US 2022/0052085 A1 (OMNIVISION TECHNOLOGIES INC.) 17 February 2022; Paragraphs [0004], [0013], [0140]	8
Y	US 2015/0054962 A1 (APTINA IMAGING CORPORATION) 26 February 2015; Paragraphs [0025] - [0027] and [0038]	9-20
Y	US 2019/0288132 A1 (W&WSENS DEVICES INC.) 19 September 2019; FIGS. 19E-19H, 55, Paragraphs [0243], [0245], [0368]	15-18
Y	US 2016/0020235 A1 (TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LTD.) 21 January 2016; FIGS. 4B, 4F, 4G; Paragraphs [0003], [0030], [0036], [0047], [0050], and [0053]	19 and 20
A	US 2018/0266944 A1 (MULTISENSOR SCIENTIFIC INC.) 20 September 2018; FIG. 2A,	7

 Further documents are listed in the continuation of Box C. See patent family annex.

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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.
	Paragraphs [0053] and [0057]	