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[Continued on next page]

(54) Title: TERAHERTZ IMAGING DEVICES AND SYSTEMS, AND RELATED METHODS, FOR DETECTION OF MATERIALS

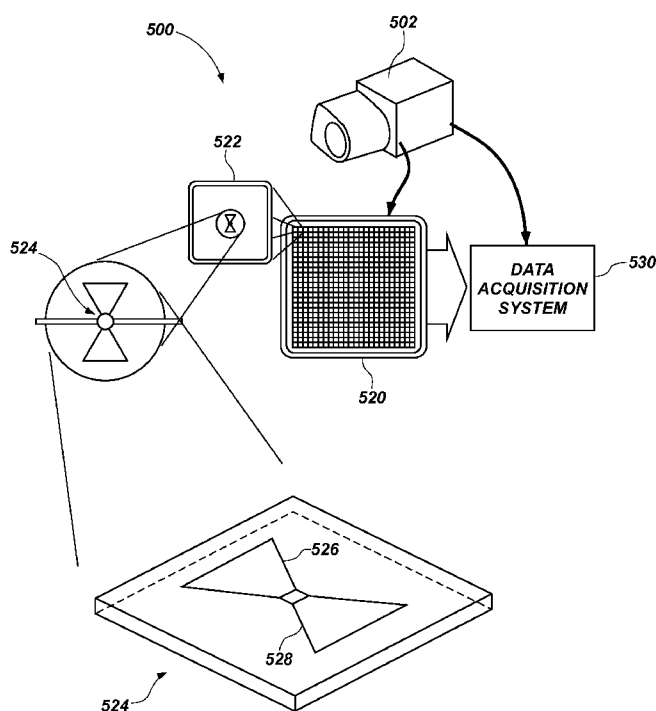


FIG. 5

(57) Abstract: Terahertz imaging devices may comprise a focal plane array including a substrate and a plurality of resonance elements. The plurality of resonance elements may comprise a conductive material coupled to the substrate. Each resonance element of the plurality of resonance elements may be configured to resonate and produce an output signal responsive to incident radiation having a frequency between about a 0.1 THz and 4 THz range. A method of detecting a hazardous material may comprise receiving incident radiation by a focal plane array having a plurality of discrete pixels including a resonance element configured to absorb the incident radiation at a resonant frequency in the THz, generating an output signal from each of the discrete pixels, and determining a presence of a hazardous material by interpreting spectral information from the output signal.



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A. CLASSIFICATION OF SUBJECT MATTER

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USPC - 250/339.07

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)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC-250/338.1

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

Patbase, Google Scholar, Google Patents

terahertz, THz, resonance element, antenna, nanoparticle, laser, LED, radiation source, absorption peak, absorption spectra, incident radiation, backscatter, substrate, focal plane, array, gangbuster, narrow band, filter, bandpass, resonant frequency

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 2008/0156991 A1 (HU et al.) 03 July 2008 (03.07.2008) entire document, especially para [0009]-[0010], [0039], [0041], [0045], [0047], [0051]-[0052], [0062]	1, 14/(1), 17, 20/(17) ----- 2-13, 14/(2-6), 15-16, 18-19, 20/(18)
Y	D.J. SHELTON et al. Gangbuster Frequency Selective Surface Metamaterials in Terahertz band Electronics Letters 23 October 2008, Vol. 44, No. 22, pages 1-2	2-6, 7/(2-6)-9/(2-6), 10/(2-6)-16/(2-6), 18, 19/(18), 20/(18)
Y	US 2008/0060455 A1 (COYLE) 13 March 2008 (13.03.2008) para [0066]-[0067]	10-12
Y	US 2009/0212217 A1 (MANN et al.) 27 August 2009 (27.08.2009) para [0007], [0052]	13
Y	US 5,450,053 A (WOOD) 12 September 1995 (12.09.1995) col 2 ln 52- col 3, ln 12	15-16
Y	US 2011/0315880 A1 (NEMIROVSKY) 29 December 2011 (29.12.2011) para [0024], table 1	19

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