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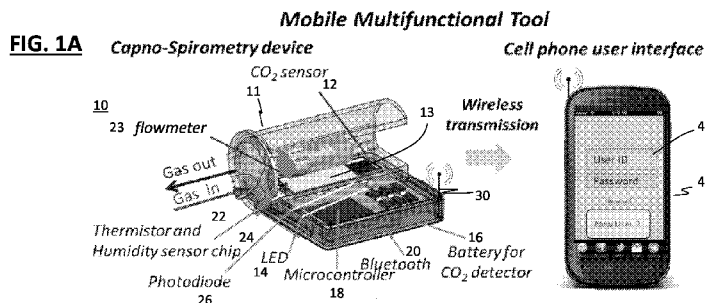
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

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(54) Title: SPECIFIC, REVERSIBLE, AND WIDE-DYNAMIC RANGE SENSOR FOR REAL TIME DETECTION OF CARBON DIOXIDE



(57) Abstract: A CO<sub>2</sub> detection chamber includes a gas inlet and a gas outlet. A CO<sub>2</sub> sensor is housed in the CO<sub>2</sub> detection chamber, where the sensor includes a reversible and selective pH-sensitive nanocomposite sensor element for CO<sub>2</sub> detection, and a hydrophobic surface. A flowmeter, a thermistor and a humidity sensor operate to read flow and compensate for humidity conditions. A light source is coupled to receive signals from the CO<sub>2</sub> sensor and respond to color changes in the sensor by transducing the color change into a light intensity change. A photodiode receives signals from the light source and responds to light intensity changes by transducing the light intensity changes into electronic signals representing varying degrees of light intensity. Data representing CO<sub>2</sub> measurements is transmitted for display to a mobile device.

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## INTERNATIONAL SEARCH REPORT

International application No.

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - G01N 21/78, G01N 21/80 (2015.01) CPC - G01N 21/783, G01N 21/80, G01N 31/22, G01N 33/004 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8)- G01N 21/78, G01N 21/80 (2015.01) CPC-G01N 21/783, G01N 21/80, G01N 31/22, G01N 33/004 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8)- G01N21/00, G01N21/25, G01N21/27, G01N21/78, G01N21/80 (2015.01); CPC-A61M2016/0413, G01N21/78, G01N21/783, G01N21/80, G01N21/81, G01N31/22, G01N31/221, G01N31/222, G01N33/004; USPC- 422/85,86,87,400,401; 436/133; 977/957 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PatBase, Proquest Dialog, Google Scholar/Patents, Search terms used: carbon dioxide CO2 inlet outlet detector sensor monitor m-cresol metacresol thymol bromothymol blue reversible pH nanocomposite hydrophobic hydrophilic reaction flowmeter thermistor humidity light LED color colour colorimetric photodiode photosensor photodetector molecular probes		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	US 2008/0072905 A1 (BAKER et al.) 27 March 2008 (27.03.2008), para [0038], [0040]-[0045], [0054]-[0061], [0063]	1-5, 9-16, 20, 21 ----- 6-8, 17-19, 22, 23
Y --- A	US 2010/0170323 A1 (LIGHTON) 08 July 2010 (08.07.2010), Fig 1, abstract, para [0004], [0005], [0027], [0029]	1-5, 9-16, 20, 21 ----- 6-8, 17-19, 22, 23
Y --- A	US 2011/0066061 A1 (COLMAN et al.) 17 March 2011 (17.03.2011), para [0010], [0014], [0068], [0039]; Fig 1C	2-5, 13-16 ----- 6-8, 17-19, 22, 23
Y --- A	US 2010/0166604 A1 (LIM et al.) 01 July 2010 (01.07.2010), abstract; para [0006], [0037], [0095]	9-11, 20, 21 ----- 22, 23
A	US 2013/0323845 A1 (KANE) 05 December 2013 (05.12.2013), Fig 1, 2a, abstract, para [0007]-[0011], [0035], [0038], [0044], [0046], [0050], [0072], [0080]	1-23
A	US 2008/0078394 A1 (OSTROWSKI et al.) 03 April 2008 (03.04.2008), entire document	1-23
A	US 2007/0048181 A1 (CHANG et al.) 01 March 2007 (01.03.2007), abstract	1-23
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
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Date of the actual completion of the international search 24 July 2015 (24.07.2015)		Date of mailing of the international search report <b>13 AUG 2015</b>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774