

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 October 2009 (01.10.2009)

PCT

(10) International Publication Number
WO 2009/120532 A3

(51) International Patent Classification:
G01N 21/01 (2006.01)

(21) International Application Number:
PCT/US2009/037359

(22) International Filing Date:
17 March 2009 (17.03.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/039,453 26 March 2008 (26.03.2008) US

(71) Applicant (for all designated States except US): **3M INNOVATIVE PROPERTIES COMPANY** [US/US]; 3M Center, Post Office Box 33427, Saint Paul, MN 55133-3427 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BOLEA, Phillip, A** [US/US]; 3M Center, Post Office Box 33427, Saint Paul, MN 55133-3427 (US).

(74) Agents: **WILLIAMS, Michael, G. @** et al.; 3M Center Office of Intellectual Property Counsel, Post Office Box 33427, St. Paul, MN 55133-3427 (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, BR, BW, BY, BZ,

CA, CH, 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, IS, JP, KE, KG, KM, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

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

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:
30 December 2009

(54) Title: SPECTRAL ANALYSIS OF BIOLOGICAL GROWTH MEDIA

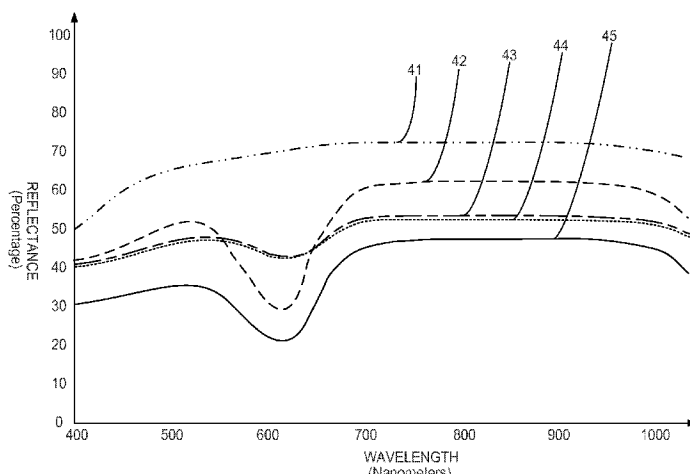


FIG. 4

(57) Abstract: This disclosure is directed to imaging techniques and image analysis techniques for automated analysis of biological growth media. According to this disclosure, the spectral responses of biological growth media can be used to identify and count biological agents from images of biological growth media. The biological growth media may be illuminated with two or more different wavelengths of electromagnetic radiation, and images of the biological growth media can be captured under these different illuminations. The spectral reflectance values in one or more first images can be normalized based on the spectral reflectance values in one or more second images, wherein the first images are associated with a different wavelength of illumination than the second images. The normalization may allow for better identification of biological agents that manifest on the biological growth media.



WO 2009/120532 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/37359

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - G01N 21/01 (2009.01) USPC - 435/288.7 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(8)-G01N 21/01 (2009.01) USPC-435/288.7 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST(PGPB,USPT,USOC,EPAB,JPAB); Google Patents; Google Scholar reflectance, spectrum, identification, bacteria, image, biological agent, infrared,Raman, plate ,film, growth medium, plate count,, colony, quantitate, enumerate, Bolea, particle		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 7,057,721 B2 (GARDNER et al.) 06 June 2006 (06.06.2006) (col 5 ln 9-55); (col 6 ln 15-67) (col 9 ln 52-67) (col 10 ln 1-38) (col 11 ln 1-20) (col 12 ln 10-60) (col 15 ln 5-15) (col 16 ln 40-67) (col 17 ln 1-50) (Figure 4)	1-32
Y	US 2004/0101951 A1 (VENT et al.) 27 May 2004 (27.05.2004) (para [0006]-[0009], [0032])	1-32
A	(KALASINSKY et al.) Raman Chemical Imaging Spectroscopy Reagentless Detection and Identification of Pathogens: Signature Development and Evaluation Anal. Chem. 2007, 79, 2658-2673. (entire document)	1-32
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 27 april 2009 (27.04.2009)		Date of mailing of the international search report 12 MAY 2009
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. 571-273-3201		Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774