(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 8 February 2007 (08.02.2007)

(51) International Patent Classification: G02B 6/00 (2006.01) G02B 5/04 (2006.01)

(21) International Application Number:

PCT/US2006/028798

(22) International Filing Date: 24 July 2006 (24.07.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

29 July 2005 (29.07.2005) 11/193.052

- (71) Applicant (for all designated States except US): 3M **INNOVATIVE PROPERTIES COMPANY [US/US];** 3m Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).
- (72) Inventors: WHITNEY, LeLand, R.; 3m Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US). KO, Byung-Soo; 22nd Floor Daehan Investment Trust Building, 27-3 Yoida-dong, Yongdungpo-ku, Post Office Box 33427, Seoul. 150-010 (KR). GARDINER, Mark, E.; 3m Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US). CHAE, Dongwon; 22nd

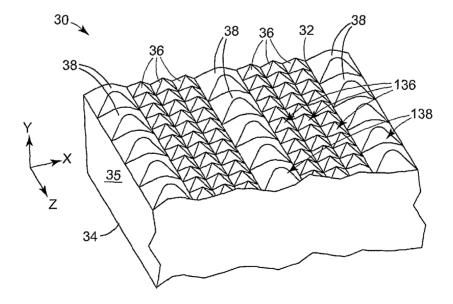
(10) International Publication Number WO 2007/016076 A3

Floor Daehan Investment Trust Building, 27-3 Yoida-dong, Yongdungpo-ku, Seoul 150-010 (KR).

- (74) Agents: KOBILANSKY, Anna, A. et al.; 3m Center, Office Of Intellectual Property Counsel, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, 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, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: STRUCTURED OPTICAL FILM WITH INTERSPERSED PYRAMIDAL STRUCTURES



(57) Abstract: Optical films are disclosed that include a substantially transparent body (35) having a first surface (34) defined by a substrate portion and a structured surface disposed over the substrate portion opposite to the first surface. The structured surface includes a plurality of smaller pyramidal structures (36) and a plurality of larger pyramidal structures (38) interspersed with the plurality of smaller pyramidal structures. Each pyramidal structure has a base including at least two first sides disposed opposite to each other and at least two second sides disposed opposite to each other. Also disclosed are optical display devices including such optical films to increase the illumination intensity.



WO 2007/016076 A3



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
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

22 March 200

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No PCT/IIS2006/028798

PCT/US2006/028798 A. CLASSIFICATION OF SUBJECT MATTER INV. G02B5/04 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) G02B 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 practical, search terms used) EPO-Internal, WPI Data C. DOCUMENTS CONSIDERED TO BE RELEVANT Relevant to claim No. Citation of document, with indication, where appropriate, of the relevant passages 1-3,5-17US 2005/024849 A1 (PARKER JEFFERY R [US] χ ET AL) 3 February 2005 (2005-02-03) figures 1,2,5,8,1645,46 paragraph [0003] paragraph [0017] paragraph [0041] paragraph [0045] paragraph [0048] paragraph [0051] paragraph [0081] EP 1 486 802 A (TOYOTA JIDOSHOKKI KK [JP]) 1-3,7,8,χ 10 - 13, 1515 December 2004 (2004-12-15) figures 8,9,19 paragraphs [0169] - [0171] X See patent family annex. Further documents are listed in the continuation of Box C. Special categories of cited documents: "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 "A" document defining the general state of the art which is not considered to be of particular relevance invention earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to "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) 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 off "O" document referring to an oral disclosure, use, exhibition or document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 11/01/2007 3 January 2007 Authorized officer Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo ni, Fax: (+31–70) 340–3016 Hylla, Winfried

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/028798

-\continua	tion). DOCUMENTS CONSIDERED TO BE RELEVANT			
ategory*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
(US 2003/234900 A1 (KIM YONG-II [KR]) 25 December 2003 (2003-12-25) abstract paragraph [0056] paragraphs [0067], [0068]; figures 5,6,12	18		
1	US 2004/246599 A1 (NILSEN ROBERT B [US]) 9 December 2004 (2004-12-09) paragraphs [0061] - [0063]; figures 1,13	1,13,18		
Α	US 2005/147374 A1 (GARDINER MARK E [US]) 7 July 2005 (2005-07-07) abstract; figure 2	1,9		

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2006/028798

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 2005024849	A1	03-02-2005	US US	2006256577 A 2005122591 A		16-11-2006 09-06-2005
EP 1486802	A	15-12-2004	CN JP KR TW US	1573365 A 2005055481 A 20040105604 A 244559 B 2005007793 A) }	02-02-2005 03-03-2005 16-12-2004 01-12-2005 13-01-2005
US 2003234900	A1	25-12-2003	CN JP KR	1467511 A 2004070309 A 20030096509 A	Ň	14-01-2004 04-03-2004 31-12-2003
US 2004246599	A1	09-12-2004	NON	E		
US 2005147374	A1	07-07-2005	AU EP WO	2004313596 A 1700140 A 2005069045 A	1	28-07-2005 13-09-2006 28-07-2005