

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
19 November 2009 (19.11.2009)

PCT

(10) International Publication Number  
**WO 2009/140334 A3**

(51) International Patent Classification:

*A61Q 11/00* (2006.01) *A61K 8/58* (2006.01)  
*A61K 8/34* (2006.01)

(21) International Application Number:

PCT/US2009/043712

(22) International Filing Date:

13 May 2009 (13.05.2009)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/053,923 16 May 2008 (16.05.2008) US

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

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BURGIO, Paul A.** [US/US]; 7377 North 101 Street, St. Paul, Minnesota 55110 (US). **VANG, Fong** [US/US]; 3M Center, P.O. Box 33427, Saint Paul, MN 55133-3427 (US). **ALI, Mahfuza B.** [US/US]; 3M Center, P.O. Box 33427, Saint Paul, MN 55133-3427 (US). **ASMUS, Robert A.** [US/US]; 3M Center, P.O. Box 33427, Saint Paul, MN 55133-3427 (US).

(74) Agents: **ERSFELD, Dean A.**, et al.; 3M Center, Office of Intellectual Property Counsel, P.O. Box 33427, Saint 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))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

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

16 December 2010

(54) Title: FOAMABLE COMPOSITIONS FOR DENTAL COATINGS AND METHODS

(57) Abstract: A foamable dental composition that includes a film-forming component and a non-aqueous carrier comprising a co-solvent selected from the group consisting of diethylene glycol monoethyl ether, dipropylene glycol, 200 to 45,000 molecular weight poly(ethylene glycol), methoxides of 200 to 45,000 molecular weight poly(ethylene glycol), hexamethyldisiloxane, and a combination thereof, wherein the film-forming component is dissolved in the carrier; wherein the film-forming component forms a retentive polymeric coating on a dental surface; and a method of forming a retentive polymeric coating on the dental surface are disclosed.



WO 2009/140334 A3

## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2009/043712

## A. CLASSIFICATION OF SUBJECT MATTER

INV. A61Q11/00 A61K8/34 A61K8/58  
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)  
A61Q

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

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                               | Relevant to claim No. |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X         | US 4 474 750 A (GAFFAR ABDUL [US] ET AL)<br>2 October 1984 (1984-10-02)                                                                                                                          | 1,8-11                |
| Y         | example 1                                                                                                                                                                                        | 1-62                  |
| Y         | -----<br>WO 2007/079069 A1 (3M INNOVATIVE<br>PROPERTIES CO [US]; ALI MAHFUZA B [US];<br>BURGIO PAUL A [U]<br>12 July 2007 (2007-07-12)<br>page 30; table 1<br>claims 1-40                        | 1-62                  |
| A         | -----<br>WO 2007/070650 A2 (3M INNOVATIVE<br>PROPERTIES CO [US]; YLITALO CAROLINE M<br>[US]; ALI MAHFUZA)<br>21 June 2007 (2007-06-21)<br>page 16, line 5 - line 11<br>page 11, line 5 - line 12 | 1-62                  |

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

## \* 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 document 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

22 October 2010

Date of mailing of the international search report

02/11/2010

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Cismaru, L

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/043712

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|----|---------------------|----------------------------|---------------------|
| US 4474750                                | A  | 02-10-1984          | NONE                       |                     |
| WO 2007079069                             | A1 | 12-07-2007          | EP 1968526 A1              | 17-09-2008          |
|                                           |    |                     | JP 2009522003 T            | 11-06-2009          |
|                                           |    |                     | US 2008299520 A1           | 04-12-2008          |
| WO 2007070650                             | A2 | 21-06-2007          | JP 2009520076 T            | 21-05-2009          |
|                                           |    |                     | US 2009130157 A1           | 21-05-2009          |