

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
9 April 2009 (09.04.2009)

PCT

(10) International Publication Number  
**WO 2009/045752 A3**

- (51) **International Patent Classification:**  
A61K 6/083 (2006.01) A61C 7/12 (2006.01)  
C08L 33/00 (2006.01)
- (21) **International Application Number:**  
PCT/US2008/076959
- (22) **International Filing Date:**  
19 September 2008 (19.09.2008)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**  
60/976,501 1 October 2007 (01.10.2007) US
- (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; and**
- (75) **Inventors/Applicants (for US only):** KALGUTKAR, Rajdeep S. [IN/US]; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US). AMOS, David T. [US/US]; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US). MCKENZIE, Taun L. [US/US]; 3M Center, Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).

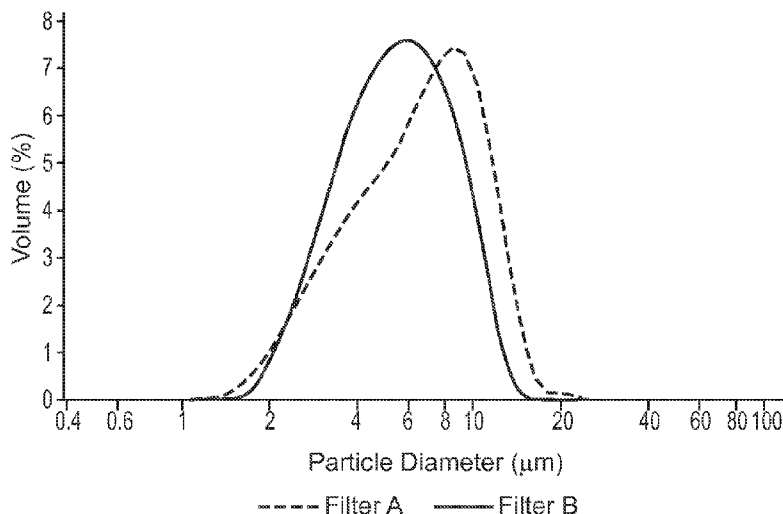
- (74) **Agents:** SOO, Philip P. et al.; 3M Center Office of Intellectual Property Counsel Post Office Box 33427, Saint Paul, Minnesota 55133-3427 (US).
- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, 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, 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))

[Continued on next page]

(54) **Title:** ORTHODONTIC COMPOSITION WITH POLYMERIC FILLERS



**Fig. 1**

(57) **Abstract:** Orthodontic adhesives are claimed which use polymeric filler particles with defined particle size characteristics. The particle size characteristics are controlled such that these adhesives provide comparable mechanical retention and cohesive strength of conventional orthodontic adhesives when used to bond orthodontic appliances to teeth. Because polymeric fillers are generally softer than inorganic fillers, these adhesives are easier to remove from the tooth than conventional adhesives after debonding an orthodontic appliance. Embodiments of the invention include both self-curing and two-part adhesives, packaged adhesive-coated orthodontic appliances, and methods for removing a cured adhesive from a tooth surface.



WO 2009/045752 A3



---

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

**Published:**

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

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

10 February 2011

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/US2008/076959

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. A61K6/083 C08L33/00 A61C7/12  
 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)  
 A61K A61C

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 249 221 A1 (TOKUYAMA DENTAL CORP [JP]; TOKUYAMA CORP [JP]) 16 October 2002 (2002-10-16) page 3, line 13	1-5, 9-16, 19-25 29-31, 37
Y	page 17, paragraph 42 page 19, paragraph 60 - paragraph 63 page 10, paragraph 29 page 23, paragraphs 94, 101 examples 2-15; table 1 claims 1-6	
Y	US 4 435 160 A (RANDKLEV RONALD M [US]) 6 March 1984 (1984-03-06) column 9; example 2 column 11; examples 8-11	29-31, 37
	----- -/-- -----	

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  29 November 2010	Date of mailing of the international search report  07/12/2010
---	--

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  Pelli Wablat, B
--	---

## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/076959

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 393 705 A1 (KERR CORP [US]) 3 March 2004 (2004-03-03)  page 3, paragraph [0013]; claims 1 11 12 14 19 20 21 23 28-30 -----	1,4,5,9, 11,16, 19,20, 29-31
X	US 4 937 144 A (PODSZUN WOLFGANG [DE] ET AL) 26 June 1990 (1990-06-26) column 1, line 4 - line 13 column 1, line 32 - column 2, line 45 column 3, line 52 - column 4, line 13 -----	1,3,4, 15,17-21
A	FR 2 363 613 A1 (KURARAY CO [JP]) 31 March 1978 (1978-03-31) page 7, line 20 - line 30 claims 1,9-14 -----	1-31
X	US 2003/198913 A1 (CINADER DAVID K [US] ET AL CINADER JR DAVID K [US] ET AL) 23 October 2003 (2003-10-23) claims; figure 1 -----	32

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2008/076959

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
EP 1249221	A1	16-10-2002	WO 0243669 A1	06-06-2002
			JP 4305594 B2	29-07-2009
			JP 2002161013 A	04-06-2002
			US 2003050359 A1	13-03-2003
US 4435160	A	06-03-1984	NONE	
EP 1393705	A1	03-03-2004	US 2004039079 A1	26-02-2004
US 4937144	A	26-06-1990	DE 3820497 A1	21-12-1989
			DK 295489 A	17-12-1989
			EP 0346708 A2	20-12-1989
			ES 2053870 T3	01-08-1994
			IE 62762 B1	22-02-1995
			JP 2040312 A	09-02-1990
			PT 90852 A	29-12-1989
FR 2363613	A1	31-03-1978	DE 2739282 A1	02-03-1978
US 2003198913	A1	23-10-2003	AT 415893 T	15-12-2008
			AU 2003212433 A1	03-11-2003
			EP 1494609 A1	12-01-2005
			JP 2005523072 T	04-08-2005
			WO 03088861 A1	30-10-2003