

21

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



DELEGATURA PROPIEDAD INDUSTRIAL

División de Nuevas Creaciones

PCT

SOLICITUD

PATENTE DE INVENCION

ENTRADA EN FASE NACIONAL

06-20975

21. EXPEDIENTE No.

54. TITULO COMPOSICION PARA EL BLANQUEADO TEMPORAL Y RAPIDO DE LOS DIENTES

51. CLASIFICACION INTERNACIONAL A61K7/16, A61K9/10, 7/30

71. SOLICITANTE COLGATE - PALMOLIVE COMPANY

DOMICILIO NEW YORK, NEW YORK, ESTADOS UNIDOS DE AMERICA

74. APODERADO JUAN PABLO CADENA SARMIENTO

22. SANTAFE DE BOGOTA, D.C.

OK

AS 100.310

1

Industria y Comercio
SUPERINTENDENCIA

SUPERINDUSTRIA Y COMERCIO
Radicación: 06028975 00000000 Fólios: 171
Fecha (AMD): 2006-03-02 15:55:48
Trámite: 011 PCT-PATENT 378 FASE NACI 411 PRESENTAC
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

FORMULARIO ÚNICO DE SOLICITUD DE PATENTE

PCT

ENTRADA EN FASE NACIONAL 15-03-2006

1

SOLICITUD DE:



Patente de Invención.



Patente de Modelo de Utilidad.



Capítulo I.



Capítulo II.

2

SOLICITANTE
(71)

Nombre: COLGATE - PALMOLIVE COMPANY

Dirección: 300 Park Avenue, New York, NY 10022,
Estados Unidos de América
Nacionalidad o Domicilio: Estados Unidos
Lugar de Constitución: Estados Unidos
Teléfono: Fax:
E-mail:

IDENTIFICACION

C.C. ☐ NIT ☐
C.E. ☐ Otro ☐
Cual _____
Número _____

3

REPRESENTANTE
O APODERADO

Nombre: JUAN PABLO CADENA SARMIENTO

Dirección: Cra. 7 No. 16-56 Piso 9

Teléfono: 380-2200 Fax: 380-2700
E-mail:

IDENTIFICACION

C.C. ☒ NIT ☐
C.E. ☐ Otro ☐
Cual _____

Número 80.410.337 TP 57492

4

INVENTOR (ES)
(72)

Nombre: Sayed Ibrahim, Suman K. Chopra, Michael Principe

Dirección: 152 Kingsberry Drive, Somerset, New Jersey 08873, US; 505 Major Road, Dayton
New Jersey 08810, US; 39 Spruce Street, West Windsor, New Jersey 08550, Estados Unidos de
América (Respectivamente)

Nacionalidad o Domicilio: Estados Unidos de América (Respectivamente)

5 PCT (86)

Solicitud Internacional No. PCT/US2004/026421 Fecha 13-08-2004

Publicación Internacional No. WO 2005/016298 A3 Fecha 24-02-2005

Título (54): COMPOSICIÓN PARA EL BLANQUEADO TEMPORAL Y RAPIDO DE LOS DIENTES

7 Clasificación Internacional (51) A61K7/16, 9/10, 7/30

8 Prioridad

SI ☒

NO ☐

(33) País de Origen

US

US

(32) Fecha

15-08-2003

10-08-2004

(31) Número de Solicitud

10/641,963

10/915,124

9 Comprobante de pago No. 06-1,520

Fecha 02-03-2006

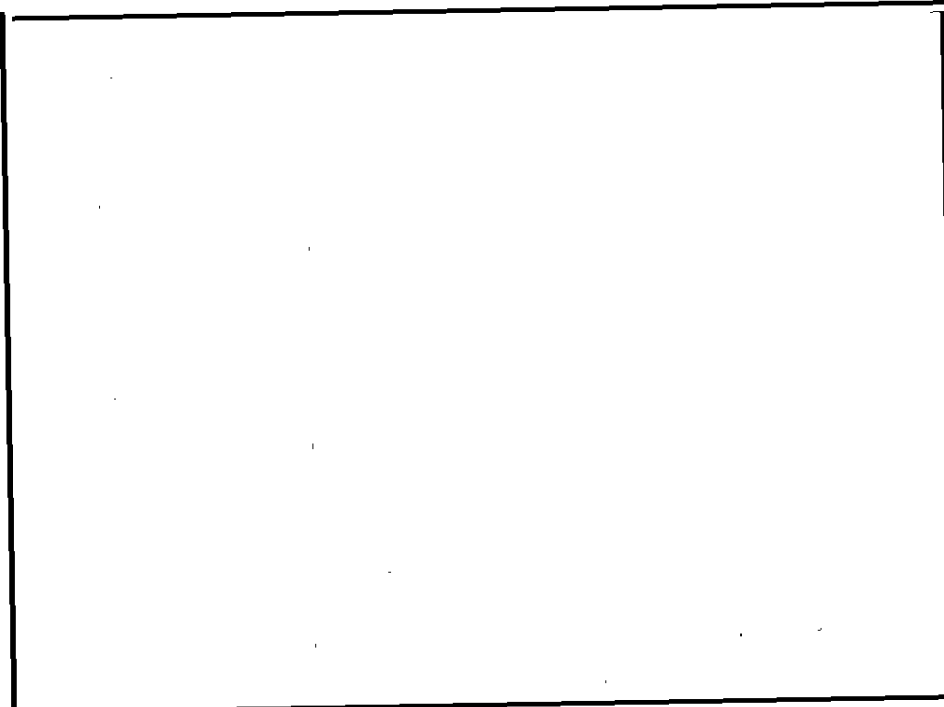
Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página.

10

ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud. \$463.000
- ☒ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso. **Fotocopia autenticada**
- ☒ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones.
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar efectuado por la IPEA.
- ☐ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- ☐ De ser el caso, certificado de depósito del material biológico.
- ☐ Arte final 12x12.
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☒ Otros: Tarjeta de Propietarios
Extracto para publicación y Tarjeta de archivo temático

11 FIGURA CARACTERÍSTICA:



12 Solicito la concesión de la patente,

NOMBRE: JUAN PABLO CADENA SARMIENTO

FIRMA:

Juan Pablo Cadena Sarmiento
C.C. 80.410.337 de Usaquén TP 57492 del C.S.J.

Instrucciones para la presentación de los anexos, ver reverso de esta página.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 06 - 1,520
FECHA : ENERO 10 DE 2006

SUPERINDUSTRIA Y COMERCIO
Radicacion : 06020975 00030200 Folios: 171
Fecha (AMD): 2006-03-02 15:55:48
Tramite : 011 PCT-PATENT 378 FASE NACI 411 PRESENTA
Dependencia: 2828 DIVISION DE NUEVAS CREACIONES

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
BRIGARD & CASTRO LTDA	CONSIGNACION	BANCO POPULAR	050-00110-6	12602354	10/01/2006	13,787,700.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
1		TRAMITES DE SOL. DE PATENTE DE IN	463,000.00
		TOTAL :	\$ 463,000.00

SOM: CUATROCIENTOS SESENTA Y TRES MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

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

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
24 February 2005 (24.02.2005)

PCT

(10) International Publication Number
WO 2005/016298 A3

(51) International Patent Classification: A61K 7/16

CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GH, GI, GM, GR, GU, HK, HU, ID, IL, IN, IS, JP, KR, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number:
PCT/US2004/026421

(22) International Filing Date: 13 August 2004 (13.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/641,963 15 August 2003 (15.08.2003) US
10/915,124 10 August 2004 (10.08.2004) US

(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, IT, LU, 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).

(71) Applicant (for all designated States except US): COLGATE-PALMOLIVE COMPANY [US/US]; 300 Park Avenue, New York, New York 10022 (US).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations

(72) Inventors; and

(75) Inventors/Applicants (for US only): IBRAHIM, Sayed [US/US]; 152 Kingberry Drive, Somerset, New Jersey 08873 (US). CHOPRA, Suman, K. [US/US]; 505 Major Road, Dayton, New Jersey 08810 (US). PRENCIPE, Michael [US/US]; 39 Spruce Street, West Windsor, New Jersey 08550 (US).

Published:

- with international search report
- before the expiration of the time limits for amending the claims and to be republished in the event of receipt of amendments

(74) Agent: BULLOCK, Kristyne, A.; Colgate-Palmolive Company, 909 River Road, PO Box 1343, Piscataway, NJ 08855-1343 (US).

(86) Date of publication of the international search report:
2 June 2005

(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,

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.

(54) Title: RAPID TEMPORARY TOOTH WHITENING COMPOSITION

(57) Abstract: A composition for the rapid, temporary whitening of teeth comprising an adhesive material and whitening particulates.

WO 2005/016298 A3

INTERNATIONAL SEARCH REPORT

Intern: Application No
PCT/US2004/026421

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61K/16

According to International Patent Classification (IPC) or to both national classification and IPC

4. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61K

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, EMBASE, BIOSIS, CHEM ABS Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Derwent Publications Ltd., London, GB; AN 2002-671681 XP002385980 "Coating agent for whitening teeth" & KR 2002 021 446 A (LG CHEM INVESTMENT LTD /LG HOUSEHOLD & HEATHCARE LTD) 21 March 2002 (2002-03-21) abstract -----	1-7, 9-11, 14-22
Y		8
Y	US 2003/068284 A1 (DIRKSING ROBERT STANLEY ET AL) 10 April 2003 (2003-04-10) paragraphs [0008], [0043], [0054]; claim 1 -----	8
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patient family members are listed in service.

* 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
- "I"** 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 (see 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

- "1" later document published after the international filing date or priority date and not in conflict with the application but aimed 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.
- "Z" document member of the same patent family

Date of the actual completion of the international search

25 November 2004

Date of mailing of the international search report

2:6 04. 2005

Name and mailing address of the ISA

European Patent Office, P.O. Box 18 Patentaan 2
NL - 2200 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Nopper-Jaunky, A

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/US2004/026421

6

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/059302 A (YISSUN RES DEV CO ; MAGDASSI SHLOMO (IL); STEINBERG DORON (IL); KAMYSH) 24 July 2003 (2003-07-24) page 15, paragraph 2; claims 1,3,4,11,12,22,30; example 2 -----	1,2,6
X	EP 0 342 746 A (UNILEVER PLC ; UNILEVER NV (NL)) 23 November 1989 (1989-11-23) examples 1,5 -----	1,2,7
X	EP 0 786 245 A (SANGI KK) 30 July 1997 (1997-07-30) example 2 -----	1,2,7
X	EP 0 710 475 A (LONDON HOSPITAL MED COLL) 8 May 1996 (1996-05-08) page 10, line 22 - line 27; example 8 -----	1,2,5
A	NIWA M ET AL: "POLISHING AND WHITENING PROPERTIES OF TOOTHPASTE CONTAINING HYDROXYAPATITE" JOURNAL OF MATERIALS SCIENCE. MATERIALS IN MEDICINE, CHAPMAN AND HALL, LONDON, GB, vol. 12, no. 3, March 2001 (2001-03), pages 277-281, XP001050900 ISSN: 0957-4530 the whole document -----	1-22

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/026421

Box II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependant claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-22 (partly)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/BA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-22 (partly)

A rapid tooth whitening composition comprising an adhesive and a whitening particulate comprising a calcium phosphate; a dental strip comprising said composition; a liquid tooth whitening composition comprising said composition; a method for whitening the surface of a tooth comprising applying said composition to a surface of a tooth.

2. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising titanium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

3. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising aluminium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

4. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising tin oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

5. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising calcium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

6. claims: 11-12,14-19,21-22 (partly)

FURTHER INFORMATION CONTINUED FROM PCT/BA/ 210

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising magnesium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

7. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polyethylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

8. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polypropylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

9. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising a copolymer of ethylene/propylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

10. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising PTFE; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

11. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polyhexafluoropropene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

INTERNATIONAL SEARCH REPORT

attention on patent family members



Patent Application No.

PCT/US2004/026421

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 2002021446 A	21-03-2002	NONE	
US 2003068284 A1	10-04-2003	US 2002006387 A1	17-01-2002
		US 2002018754 A1	14-02-2002
		US 5891453 A	06-04-1999
		US 5879691 A	09-03-1999
		AT 247932 T	15-09-2003
		AU 763529 B2	24-07-2003
		AU 3743600 A	04-10-2000
		BR 0009075 A	18-12-2001
		CA 2367148 A1	21-09-2000
		CN 1343109 A	03-04-2002
		CZ 20013285 A3	13-02-2002
		DE 60004796 D1	02-10-2003
		DE 60004796 T2	17-06-2004
		EP 1161198 A1	12-12-2001
		ES 2200050 T3	16-03-2004
		HK 1043722 A1	13-08-2004
		HU 0200573 A2	29-06-2002
		JP 2002538087 T	19-11-2002
		MX PA01009344 A	21-06-2002
		NO 20014472 A	13-11-2001
		NZ 514199 A	28-09-2001
		PL 349808 A1	09-09-2002
		RU 2219895 C2	27-12-2003
		SK 13092001 A3	04-04-2002
		TR 200102685 T2	21-12-2001
		WO 0054699 A1	21-09-2000
		AT 264657 T	15-05-2004
		AU 7005398 A	21-12-1998
		CA 2293352 A1	10-12-1998
		CN 1259029 A	05-07-2000
		DE 29824970 U1	13-11-2003
		DE 69823364 D1	27-05-2004
		DE 69823364 T2	17-02-2005
		EP 1438928 A1	21-07-2004
		EP 1011516 A1	28-06-2000
		ES 2221173 T3	16-12-2004
		HU 0003176 A2	28-02-2001
		JP 2002503990 T	05-02-2002
		NO 995930 A	03-02-2000
		PL 337207 A1	14-08-2000
		PT 1011516 T	30-09-2004
		RU 2190982 C2	20-10-2002
		SK 167999 A3	11-07-2000
		WO 9855044 A1	10-12-1998
WO 03059302 A	24-07-2003	AU 2002364491 A1	30-07-2003
		WO 03059302 A1	24-07-2003
		US 2005058744 A1	17-03-2005
EP 0342746 A	23-11-1989	AU 597199 B2	24-05-1990
		AU 3480089 A	23-11-1989
		BR 8902337 A	09-01-1990
		DE 68901492 D1	17-06-1992
		EP 0342746 A1	23-11-1989
		ES 2041971 T3	01-12-1993
		HK 91893 A	10-09-1993

INTERNATIONAL SEARCH REPORT

attention on patent family members

International Application No.
PCT/US2004/026421

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0342746 A		IN 168407 A1	30-03-1991
		JP 2022214 A	25-01-1990
		PH 26077 A	06-02-1992
		US 4988499 A	29-01-1991
EP 0786245 A	30-07-1997	JP 9202717 A	05-08-1997
		DE 69713175 D1	10-07-2002
		DE 69713175 T2	23-01-2003
		EP 0786245 A1	30-07-1997
		US 5833959 A	10-11-1998
EP 0710475 A	08-05-1996	DE 69524037 D1	03-01-2002
		DE 69524037 T2	11-04-2002
		DK 710475 T3	13-05-2002
		EP 0710475 A1	08-05-1996
		ES 2168340 T3	16-06-2002
		JP 8208417 A	13-08-1996
		US 5679710 A	21-10-1997

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

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
24 February 2005 (24.02.2005)

PCT

(10) International Publication Number
WO 2005/016298 A2

(51) International Patent Classification⁷: A61K 7/16

(21) International Application Number:
PCT/US2004/026421

(22) International Filing Date: 13 August 2004 (13.08.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/641,963 15 August 2003 (15.08.2003) US
10/915,124 10 August 2004 (10.08.2004) US

(71) Applicant (for all designated States except US): COL-
GATE-PALMOLIVE COMPANY [US/US]; 300 Park
Avenue, New York, New York 10022 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): IBRAHIM, Sayed
[US/US]; 152 Kingsberry Drive, Somerset, New Jersey
08873 (US). CHOPRA, Sumant, K. [US/US]; 505 Major
Road, Dayton, New Jersey 08810 (US). PRENCIPE,
Michael [US/US]; 39 Spruce Street, West Windsor, New
Jersey 08550 (US).

(74) Agent: SUTER, David L.; Harness, Dickey & Pierce,
P.L.C., P.O. Box 828, Bloomfield Hills, MI 48303 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AB, 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, GH, GI, GM, GR, GU, HK, HN, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MY, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, SI, 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, IT, LU, 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).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a
patent (Rule 4.17(ii)) for all designations
- as to the applicant's entitlement to claim the priority of the
earlier application (Rule 4.17(iii)) for all designations

Published:

- without international search report and to be republished
upon receipt of that report

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

(54) Title: RAPID TEMPORARY TOOTH WHITENING COMPOSITION

(57) Abstract: A composition for the rapid, temporary whitening of teeth comprising an adhesive material and whitening particu-
lates.

WO 2005/016298 A2

16 13

RAPID TEMPORARY TOOTH WHITENING COMPOSITION**INTRODUCTION**

[0001] The present invention relates to rapid tooth whitening systems. Embodiments of the present invention include tooth whitening compositions comprising whitening particulates and adhesive agents.

[0002] Many substances such as tea and coffee that a person confronts or comes in contact with on a daily basis can "stain" or reduce the "whiteness" of one's teeth. Consumers consider clean, white teeth to be aesthetically desirable. Dull looking, stained teeth are objectionable to most people both on the basis of cosmetic appearance and also socially as an indication of poor oral hygiene. One whose teeth are white may enjoy more personal confidence and satisfaction and may even enjoy greater social acceptance.

[0003] Dental gel compositions containing active oxygen liberating ingredients such as hydrogen peroxide, urea peroxide, percarbonates and perborates of alkali and alkaline earth metals have been disclosed in the prior art for whitening teeth. Such gel compositions although effective for whitening teeth require multiple applications of the gel over a period of one to two weeks to provide the desired whitening effect and in some instances requires a skilled professional to apply the gel. However, it is in many situations it is desirable to cosmetically improve the appearance of the teeth, that is whiten the teeth rapidly and temporarily as in immediate anticipation of an important public appearance or social event.

[0004] There is a continuing need for a rapid temporary tooth whitening system which can be safely applied by the wearer and without the need for specially trained dental personnel. The tooth whitening to be achieved should be easily applied to the teeth and once applied to the

teeth, be able to resist removal by mastication or solvating by foods and beverages for a period for at least 5 to 8 hours, but should be able to be easily removed by a wearer without harming the tooth. In this respect the prior art discloses tooth whitening coatings which can be applied to the tooth as a beauty aid providing immediate temporary whitening when applied to dental enamel in the same manner as one would apply a nail polish as for example as disclosed in US 4,021,915; 4,032,627; 4,482,535 and 6,210,163, however there is a need for improved temporary whitening compositions that are effective, durable, and impart a "natural" look to the users tooth.

SUMMARY

[0005] In one embodiment, the present invention provides a rapid tooth whitening composition for imparting a natural white appearance to dental enamel. The composition comprises an adhesive and a whitening particulate comprising hydroxyapatite.

[0006] In an embodiment of the present invention, a rapid tooth whitening composition for imparting a natural white appearance to dental enamel comprises a siloxane pressure sensitive adhesive and a whitening particulate.

[0007] In another embodiment, the present invention provides a method of imparting whiteness to a tooth in a mammal. The method comprises applying a composition to the tooth comprising a siloxane pressure sensitive adhesive and a whitening particulate.

[0008] It has been discovered that compositions and methods of this invention afford advantages over temporary whitening compositions among those known in the art including one or more of: enhanced whitening efficacy and aesthetics, improved adherence of the whitening composition to the tooth surface in the presence of saliva. Further uses, benefits and embodiments of the present invention are apparent from the description set forth herein.

DESCRIPTION

[0009] The following definitions and non-limiting guidelines must be considered in reviewing the description of this invention set forth herein. The headings (such as "Introduction" and "Summary,") and sub-headings (such as "Whitening Compositions" and "Methods", for example) used herein are intended only for general organization of topics within the disclosure of the invention, and are not intended to limit the disclosure of the invention or any aspect thereof. In particular, subject matter disclosed in the "Introduction" may include aspects of technology within the scope of the invention, and may not constitute a recitation of prior art. Subject matter disclosed in the "Summary" is not an exhaustive or complete disclosure of the entire scope of the invention or any embodiments thereof. Classification or discussion of a material within a section of this specification as having a particular utility (e.g., as being an "active" or a "carrier" ingredient) is made for convenience, and no inference should be drawn that the material must necessarily or solely function in accordance with its classification herein when it is used in any given composition.

[0010] The citation of references herein does not constitute an admission that those references are prior art or have any relevance to the patentability of the invention disclosed herein. Any discussion of the content of references cited in the Introduction is intended merely to provide a general summary of assertions made by the authors of the references, and does not constitute an admission as to the accuracy of the content of such references. All references cited in the Description section of this specification are hereby incorporated by reference in their entirety.

[0011] The description and specific examples, while indicating embodiments of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention. Moreover, recitation of multiple embodiments having stated features is not

intended to exclude other embodiments having additional features, or other embodiments incorporating different combinations the stated of features. Specific Examples are provided for illustrative purposes of how to make and use the compositions and methods of this invention and, unless explicitly stated otherwise, are not intended to be a representation that given embodiments of this invention have, or have not, been made or tested.

[0012] As used herein, the words "preferred" and "preferably" refer to embodiments of the invention that afford certain benefits, under certain circumstances. However, other embodiments may also be preferred, under the same or other circumstances. Furthermore, the recitation of one or more preferred embodiments does not imply that other embodiments are not useful, and is not intended to exclude other embodiments from the scope of the invention.

[0013] As used herein, the word "include," and its variants, is intended to be non-limiting, such that recitation of items in a list is not to the exclusion of other like items that may also be useful in the materials, compositions, devices, and methods of this invention.

[0014] As referred to herein, all compositional percentages are by weight of the total composition, unless otherwise specified.

Tooth Whitening Compositions

[0015] In accordance with various embodiments of the present invention, a whitening composition is provided for imparting a natural white appearance to a tooth surface. The tooth surface is generally comprised of dental enamel, and the whitening composition contacts and preferably adheres to the dental enamel to impart an immediate discernable whitening effect, thus rapidly altering the color of the surface of the tooth. The present invention provides methods for whitening a tooth surface using compositions according to the

present invention. As referred to herein, "tooth" or "teeth" refers to natural tooth, dentures, dental plates, fillings, caps, crowns, bridges, dental implants, and the like, and any other hard surfaced dental prosthesis either permanently or temporarily fixed within the oral cavity. As used herein, "whitening" refers to a change in visual appearance of a tooth, preferably such that the tooth has a brighter shade. Increase in whiteness of a dental surface can be observed visually, for example with the aid of color comparison charts or gauges, or measured by colorimetry, using any suitable instrument such as a Minolta Chromameter, e.g., model CR-400 (Minolta Corp., Ramsey, NJ). The instrument can be programmed, for example, to measure Hunter Lab values or L*a*b* values according to the standard established by the International Committee of Illumination (CIE). The L*a*b* system provides a numerical representation of three-dimensional color space where L* represents a lightness axis, a* represents a red-green axis and b* represents a yellow-blue axis. The L* and b* axes are typically of greatest applicability to measurement of tooth whiteness. Increase in whiteness can be computed from differences in L*, a* and b* values before and after treatment, or between untreated and treated surfaces. A useful parameter is ΔE^* , calculated as the square root of the sum of the squares of differences in L*, a* and b* values, using the formula:

$$\Delta E^* = [(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]^{1/2}$$

A higher value of ΔE^* indicates greater increase in whiteness. In various embodiments, the method of the present invention can effect a ΔE^* of at least about 1, or at least about 3, or at least about 4, or at least about 5.

[0016] In one embodiment of the present invention, the whitening composition comprises an adhesive and a whitening particulate. The whitening composition can comprise additional ingredients, as recognized by one of skill in the art. The whitening composition can

be incorporated into a dental strip or film form, or into a liquid product which can be applied to the surface of a tooth by manual application. In another embodiment, methods of whitening a surface of a tooth are provided.

Adhesives

[0017] In various embodiments of the present invention, the whitening composition comprises an adhesive, which serves multiple functions, including enhancing adherence of the whitening composition to the surface of the tooth to be whitened. In such embodiments, the adhesive generally comprises one or more organic polymers or copolymers that are dispersed or dissolved in a volatile solvent.

[0018] A variety of organic polymers are useful as adhesives with the present invention. For example, one preferred class of adhesive polymers comprise siloxane polymers, which are also generally known in the art as "silicone" polymers. In certain embodiments of the present invention, the adhesive polymers in the composition are those in which a whitening particulate can be dispersed and are well known in the art. Many such silicone polymers are commercially available. In various embodiments, a preferred silicone-based adhesive polymer is a polyorganosiloxane. One such polyorganosiloxane is produced by condensing a silicone resin and an organosiloxane such as a polydiorganosiloxane. Such polymers are an elastomeric, tacky material, adhesion of which to dental enamel surfaces can be varied by altering the ratio of silicone resin to polydiorganosiloxane in the copolymer molecule. Preferably, the polymers are pressure sensitive polymers specifically designed for pharmaceutical use and are permeable to many drug compounds and find application for the transdermal application of various compounds. In one such embodiment, the silicone polymers are the copolymer product of mixing a silanol terminated polydiorganosiloxane such as polydimethyl siloxane with a silanol-

27 19

containing silicone resin whereby the silanol groups of the polydiorganosiloxane undergo a condensation reaction with the silanol groups of the silicone resin so that the polydiorganosiloxane is lightly crosslinked by the silicone resin (that is, the polydiorganosiloxane chains are bonded together through the resin molecules to give chain branching and entanglement and/or a small amount of network character) to form the silicone polymers. A catalyst, for example, an alkaline material, such as ammonia, ammonium hydroxide or ammonium carbonate, can be mixed with the silanol-terminated polydiorganosiloxane and the silicone resin to promote this crosslinking reaction. By copolymerizing the silicone resin with the silanol terminated polydiorganosiloxane, there results a polymer with self adhering properties and the cohesive properties of a soft elastomer matrix characteristic of pressure sensitive polymers being distinguished from the hard, non-elastomeric properties of other silicone resins. In one embodiment, adhesive polymers used in the whitening composition are available from the Dow-Corning Company under the brand name BIO-PSA.

[0019] The modification of a ratio of silicone resin to polydiorganosiloxane modifies the tackiness of the hydrophilic polymer. This ratio can be in the range of about 70:30 to about 50:50. For example, the BIO-PSA silicone sold by Dow-Corning is available in three silicone resin to silicone polymer ratios namely, 65/35 (low tack), 60/40 (medium tack), 55/45 (high tack). The rapid tooth whitening composition in some embodiments according to the invention contains an organic adhesive dispersed or dissolved in the volatile solvent. For example, a polyorganosiloxane pressure sensitive adhesive is available dissolved in either ethyl acetate solvent or dimethicone.

[0020] In other embodiments of the present invention, useful polymers for adhesives include those such as Carbomers, such as carboxymethylene polymers including

23 20

acrylic acid polymers and acrylic acid copolymers. Carboxypolymethylene is a slightly acidic vinyl polymer with active carboxyl groups. A carboxypolymethylene preferred for use in the practice of the present invention is a copolymer of acrylic acid cross linked with approximately 0.75% to approximately 1.5% polyallyl sucrose that is sold under the trade designation Carbopol 934, 974 by B.F. Goodrich. The adhesive is preferably a natural resin, particularly a resin selected from shellac resins, colophonium resins and modified colophonium resins. Another suitable group of adhesives is organic polymeric compositions represented by the group of alkyd resins, polyvinyl acetals, polyvinyl alcohols, polyvinyl acetates, poly(ethylene oxide), polyacrylates, ketone resins, polyvinylpyrrolidone, polyvinylpyrrolidone/vinyl acetate copolymer, polyethylene glycols of 200 to 1000 molecular weight and polyoxyethylene/polyoxopropylene block copolymers (Polyox), and silicone resins. As appreciated by one of skill in the art, the adhesive polymers may comprise copolymers or mixtures of polymers, including the adhesive polymers described herein.

[0021] In various embodiments, the adhesive polymer is present in the liquid whitening compositions of the present invention at a concentration of about 1 to about 80% by weight and preferably about 15 to about 40% by weight.

Volatile Carrier

[0022] Certain embodiments of the present invention comprise carriers, especially those whitening compositions that are in liquid solution. Some suitable carriers for use in the preparation of the whitening compositions of the present invention include volatile solvents such as water, ethanol and ethyl acetate and non-volatile, water soluble solvents such as triacetin. Generally the solvent in which the whitening particle is dispersed is present in the composition

at a concentration of about 10 to about 80% by weight and preferably about 40 to about 70% by weight.

Whitening Particulates

[0023] In various embodiments, the whitening composition comprises a whitening particulate. As used herein, the term "whitening particulate" can encompass a plurality of whiteness-imparting particulates or particles within the whitening composition. It should be noted that the plurality of particulates may comprise one or more different species of whitening particulate materials that are independently selected from one another. The selection of multiple whitening particles may be useful for modifying the overall color shade of the whitening composition. In various embodiments, the whitening particulates can be any white colored or white pigmented particles such as, for example, white mineral particles, white metal oxide particles, or a white polymer particles. As used herein, "white" is considered a color, and a "white" color can be any color commonly perceived as white, for example colors set forth in the Vita Shade Guide scale of whiteness, or colors that are perceived as whiter than those displayed in the Vita Shade Guide.

[0024] In various embodiments of the present invention, the average diameter of such particles can be from about 0.5 μm (microns) to about 500 microns, from about 10 microns to about 100 microns, or from about 20 microns to about 50 microns.

[0025] In some embodiments, white mineral particles can comprise a non-toxic mineral or salt that can impart a white color. In various embodiments, the whitening particulates can comprise a calcium phosphate. In various configurations, the calcium phosphate can have a structure selected from tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate and hydroxyapatite ($\text{Ca}_5(\text{OH})(\text{PO}_4)_3$). The calcium

2722

phosphate in various embodiments, can be a substantially aqueous insoluble calcium phosphate and non-crystalline, poorly crystalline or crystalline form such as, for example, crystalline hydroxyapatite.

[0026] Hydroxyapatite has a similar physical structure as tooth enamel, and thus has a strong affinity to the tooth enamel surfaces, resulting in the hydroxyapatite particulates imparting a "natural" white appearance to the enamel surface, where they are used. The preparation of hydroxyapatite is well known to the art as disclosed in U.S. 4,274,879; U.S. 4,330,514; U.S. 4,324,772; U.S. 4,408,300; U.S. 4,097,935; U.S. 4,207,300. The hydroxyapatite whitening agent is present in the whitening composition of the present invention at a concentration of about 0.5 to about 60% by weight and preferably about 15 to about 40% by weight.

[0027] Non-limiting examples of a hydroxyapatite include Hydroxyapatite A1 (Himed, Old Bethpage, NY). In some configurations, hydroxyapatite particles can comprise aggregates of smaller hydroxyapatite particles. In non-limiting example, such aggregates can have a mean diameter of from about 100 nm to about 1000 nm, and comprise hydroxyapatite particles having a mean diameter of from about 0.1 nm to about 10 nm.

[0028] The whitening particulates can be, in some embodiments, a metal oxide. The metal oxide can comprise any metal oxide that provides a white color, such as, for example, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, barium oxide, or a combination thereof.

[0029] The whitening particulates can be, in some embodiments, polymeric white-colored particles such as disclosed in US Patent 6,669,930 to Hoic. Polymeric white-colored particles can comprise, in non-limiting example, polyethylene (PE), polypropylene,

ethylene/propylene copolymer, polytetrafluoroethylene (PTFE) or polyhexafluoropropene. In a non-limiting example, the polymeric white-colored particles can be polyethylene PE220, polypropylene, or PTFE as supplied by PreSpensa, Inc., Somerset NJ. In a non-limiting example, the polymeric whitening particulates can comprise a polymer having a weight average molecular weight, a number average molecular weight, a Z-average molecular weight or a viscosity average molecular weight ranging from about 100 to about 10,000,000; from about 200 to about 5,000,000; from about 500 to about 1,000,000; from about 1,000 to about 500,000; from about 10,000 to about 100,000, or from about 20,000 to about 50,000.

[0030] In some embodiments, the whitening particulates can comprise pearlescent particles. In some configurations, the pearlescent particles can provide a white pearlescent appearance to a composition herein. "Pearlescence" and "pearlescent," as used herein, refers to an optical property of a material in which the material can have a pearl-like, lustrous appearance. In some configurations, a pearlescent material can provide an appearance of depth. In some aspects, a pearlescent material can further provide an appearance of shine. Without being limited by theory, pearlescent particles are believed to partially reflect and partially refract incident light. The extent of partial refraction or reflection of incident light by a pearlescent material can depend on the angle of light incidence and/or the angle of viewing. Pearlescent particles used in the compositions described herein can provide aesthetic or cosmetic effects such as, for example, sparkle or luster.

[0031] Pearlescent particles can comprise a single mineral or chemical species, such as, for example a silicate such as mica, or bismuth oxychloride. By "mica" is meant any one of a group of hydrous aluminum silicate minerals with platy morphology and perfect basal (micaceous) cleavage. Mica can be, for example, sheet mica, scrap mica or flake mica, as

exemplified by muscovite, biotite or phlogopite type micas. In some embodiments, the pearlescent particles can comprise a complex comprising more than one mineral or chemical species, such as, for example, mica coated with a metal oxide such as titanium oxide. Pearlescent particles can also be of biological origin, for example fish scale or mother-of-pearl. Certain pearlescent particles of biological origin can comprise calcium carbonate, such as, for example, pearl, mollusk shell such as mother-of-pearl obtained from oyster shell, or nacre.

[0032] In some embodiments, white pearlescent particles can be, for example, those described as Timiron® pigments, Biron® powders, Biron® dispersions or Nailsyn® dispersions (all registered trademarks of EM Industries, Inc. Hawthorne, NY, division of E. Merck). For example, mica titanium particles can be pearlescent particles such as Timiron® particles. White pearlescent mica titanium particles can be, for example "Silverwhite" Timiron® particles such as Timiron® Starluster MP-115, Timiron® Superaheen MP-1001, Timiron® Sparkle MP-47, Timiron® Supersilk MP-1005, Timiron® Pearl Flake MP-10, Timiron® Pearl Sheen MP-30, Timiron® Super Silver Fine, Timiron® Gleamer Flake MP-111, Timiron® Ultraluster MP-45, Timiron® Transwhite MP-18, Timiron® Diamond Cluster MP-149, Timiron® Super Silver, Timiron® Stardust MP-80, Timiron® Arctic Silver or Timiron® Snowflake MP-99.

[0033] A tooth-coating fluid of the present invention can comprise whitening particulates from about 0.01% (w/w) up to about 50% (w/w), from about 0.1% (w/w) up to about 20% (w/w), from about 1% (w/w) up to about 19% (w/w), from about 2% (w/w) up to about 18% (w/w), from about 3% (w/w) up to about 17% (w/w), from about 4% (w/w) up to about 16% (w/w), or from about 6% (w/w) up to about 15% (w/w). In some configurations, the whitening particulates (including pearlescent particles) can have an average size of from about 0.01 micron to about 500 microns, from about 0.5 micron to about 100 microns, or from about 2

microns to about 20 microns in diameter or longest dimension. Such particles as referenced herein are intended to include primary particles as well as aggregates of particles.

[0034] The plurality of whitening particulates can be independently comprised of a material selected from the group consisting of calcium phosphate compounds, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, ethylene/propylene copolymer, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof. In one embodiment, the plurality of whitening particulates can comprise a calcium phosphate, such as a hydroxyapatite, in particular a crystalline hydroxyapatite.

Additional Ingredients

[0035] In some embodiments, a sweetening material is employed in the tooth whitening composition of the present invention. Suitable sweetening agents include sodium saccharin, sodium cyclamate, xylitol, aspartame and the like, in concentrations of about 0.01 to about 1% by weight and preferably about 0.05 to about 0.75% by weight. Sodium saccharin is preferred for certain embodiments.

[0036] The tooth whitening compositions of the present invention optionally comprise a flavoring agent in various embodiments. Flavoring agents that are used in such embodiments include essential oils as well as various flavoring aldehydes, esters, alcohols, and similar materials. Examples of the essential oils include oils of spearmint, peppermint, wintergreen, sassafras, clove, sage, eucalyptus, marjoram, cinnamon, lemon, lime, grapefruit, and orange. Also useful are such chemicals as menthol, carvone, and anethole. Of these, the most commonly employed are the oils of peppermint, spearmint and wintergreen. The flavoring agent is incorporated in the whitening liquid composition of the present invention at a

concentration of about 0.1 to about 2% by weight and preferably about 0.1 to about 0.5% by weight.

[0037] The compositions of the present invention optionally comprise an antimicrobial (e.g., antibacterial) agent. Any orally acceptable antimicrobial agent can be used, including Triclosan (5-chloro-2-(2,4-dichlorophenoxy)phenol); 8-hydroxyquinoline and salts thereof; zinc and stannous ion sources such as zinc citrate, zinc sulphate, zinc glycinate, sodium zinc citrate and stannous pyrophosphate; copper (II) compounds such as copper (II) chloride, fluoride, sulfate and hydroxide; phthalic acid and salts thereof such as magnesium monopotassium phthalate; sanguinarine; quaternary ammonium compounds, such as alkylpyridinium chlorides (e.g., cetylpyridinium chloride (CPC), combinations of CPC with zinc and/or enzymes, tetradecylpyridinium chloride, and N-tetradecyl-4-ethylpyridinium chloride); biguanides, such as chlorhexidine digluconate, hexetidine, octenidine, alexidine; halogenated bisphenolic compounds, such as 2,2' methylenebis-(4-chloro-6-bromophenol); benzalkonium chloride; salicylanilide, domiphen bromide; iodine; sulfonamides; bisbiguanides; phenolics; piperidino derivatives such as delmopinol and octapinol; magnolia extract; grapeseed extract; thymol; eugenol; menthol; geraniol; carvacrol; citral; eucalyptol; catechol; 4-allylcatechol; hexyl resorcinol; methyl salicylate; antibiotics such as augmentin, amoxicillin, tetracycline, doxycycline, minocycline, metronidazole, neomycin, kanamycin and clindamycin; and mixtures thereof. A further illustrative list of useful antibacterial agents is provided in U.S. Patent 5,776,435, Gaffar, et al., issued July, 7, 1998.

[0038] The compositions of the present invention optionally comprise an antioxidant. Any orally acceptable antioxidant can be used, including butylated hydroxyanisole

(BHA), butylated hydroxytoluene (BHT), vitamin A, carotenoids, vitamin E, flavonoids, polyphenols, ascorbic acid, herbal antioxidants, chlorophyll, melatonin, and mixtures thereof.

[0039] The compositions of the present invention optionally comprise a saliva stimulating agent, useful for example in amelioration of dry mouth. Any orally acceptable saliva stimulating agent can be used, including without limitation food acids such as citric, lactic, malic, succinic, ascorbic, adipic, fumaric, and tartaric acids, and mixtures thereof. One or more saliva stimulating agents are optionally present in a saliva stimulating effective total amount.

[0040] The compositions of the present invention optionally comprise a breath freshening agent. Any orally acceptable breath freshening agent can be used, including without limitation zinc salts such as zinc gluconate, zinc citrate and zinc chlorite, α -ionone and mixtures thereof. One or more breath freshening agents are optionally present in a breath freshening effective total amount.

[0041] The compositions of the present invention optionally comprise an antiplaque (e.g., plaque disrupting) agent. Any orally acceptable antiplaque agent can be used, including without limitation stannous, copper, magnesium and strontium salts, dimethicone copolyols such as cetyl dimethicone copolyol, papain, glucoamylase, glucose oxidase, urea, calcium lactate, calcium glycerophosphate, strontium polyacrylates and mixtures thereof.

[0042] The compositions of the present invention optionally comprise an anti-inflammatory agent. Any orally acceptable anti-inflammatory agent can be used, including steroidal agents such as flucinolone and hydrocortisone, and nonsteroidal agents (NSAIDs) such as ketorolac, flurbiprofen, ibuprofen, naproxen, indomethacin, diclofenac, etodolac, indomethacin, sulindac, tolmetin, ketoprofen, fenoprofen, piroxicam, nabumetone, aspirin,

37 28

diffenissal, meclofenamate, mefenamic acid, oxyphenbutazone, phenylbutazone, and mixtures thereof.

[0043] The compositions of the present invention optionally comprise an H2 antagonist. H2 antagonists useful herein include cimetidine, etimidine, ranitidine, ICIA-5165, tiotidine, ORF-17578, lupitidine, donetidine, famotidine, roxatidine, pifatidine, lamtidine, BL-6548, BMY-25271, zaltidine, nizatidine, mifentidine, BMY-52368, SKF-94482, BL-6341A, ICI-162846, ramixotidine, Wy-45727, SR-58042, BMY-25405, loxidine, DA-4634, biefentidine, sufotidine, ebrotidine, HB-30-256, D-16637, FRG-8813, FRG-8701, impromidine, L-643728, HB-408.4, and mixtures thereof.

[0044] The compositions of the present invention optionally comprise a desensitizing agent. Desensitizing agents useful herein include potassium citrate, potassium chloride, potassium tartrate, potassium bicarbonate, potassium oxalate, potassium nitrate, strontium salts, and mixtures thereof. Alternatively or in addition a local or systemic analgesic such as aspirin, codeine, acetaminophen, sodium salicylate or triethanolamine salicylate can be used.

[0045] The compositions of the present invention optionally comprise a nutrient. Suitable nutrients include vitamins, minerals, amino acids, and mixtures thereof. Vitamins include Vitamins C and D, thiamine, riboflavin, calcium pantothenate, niacin, folic acid, nicotinamide, pyridoxine, cyanocobalamin, para-aminobenzoic acid, bioflavonoids, and mixtures thereof. Nutritional supplements include amino acids (such as L-tryptophan, L-lysine, methionine, threonine, levocarnitine and L-carnitine), lipotropics (such as choline, inositol, betaine, and linoleic acid), fish oil (including components thereof such as omega-3 (N-3))

3229

polyunsaturated fatty acids, eicosapentaenoic acid and docosahexaenoic acid), coenzyme Q10, and mixtures thereof.

[0046] The compositions of the present invention optionally comprise biomolecules, such as bacteriocins, antibodies, and proteins. Suitable proteins include milk proteins and enzymes such as peroxide-producing enzymes, amylase, plaque-disrupting agents such as papain, glucoamylase, glucose oxidase, and "next generation" enzymes.

[0047] The compositions of the present invention optionally comprise additional ingredients, such as, plaque buffers such as urea, calcium lactate, calcium glycerophosphate and strontium polyacrylates; plant extracts; opacifying agents, and additional pigments and/or coloring agents.

[0048] The whitening composition of the present invention may be applied to tooth enamel by any suitable means, such as for example, in extruded form as a strip or as a liquid such as a paint-on liquid.

Strip

[0049] The whitening composition of the present invention may be in the form of a layer of a strip prepared using a conventional solvent casting process. Strips among those useful herein comprise polymers, natural and synthetic woven materials, non-woven material, foil, paper, rubber and combinations thereof. Preferably the strip of material is substantially water insoluble. Suitable polymers include polyethylene, ethylvinylacetate, polyesters, ethylvinyl alcohol, fluoroplastics, and combinations thereof. In various embodiments, the strip of material is generally less than about 1 mm (millimeter) thick, optionally less than about 0.05 mm thick, optionally about 0.001 to about 0.03 mm thick. The shape of the strip is any shape

and size that covers the desired oral surface. In one embodiment, the length of the strip material is from about 2 cm (centimeter) to about 12 cm, in another embodiment from about 4 cm to about 9 cm. The width of the strip material will also depend on the oral surface area to be covered. The width of the strip is generally from about 0.5 cm to about 4 cm, in one embodiment from about 1 cm to about 2 cm. The strip material may comprise shallow pockets, optionally filled by a composition of this invention. Strips among those useful herein are disclosed in U.S. Patent 6,514,484, Rajaiah et al. issued February 4, 2003.

[0050] For example, in some embodiments, a strip is prepared by solvent casting, an adhesive polymer or resin such as colophonium and/or polyvinylpyrrolidone is dissolved in a sufficient amount of a compatible solvent such as ethanol. After a solution has been formed, the addition of whitening particulates in powder form (e.g., hydroxyapatite) follows and any other ingredients such as sweeteners or flavors. The solution is coated onto a suitable casting carrier material from which the formed strip can be easily released from without damage. The carrier material must have a surface tension which allows the solution to spread evenly across the intended carrier width without soaking in to form a destructive bond between the two substrates. Examples of suitable carrier materials include glass, stainless steel, teflon, polyethylene impregnated kraft paper. The strip may be dried to a solid usable form in a high temperature air bath using a drying oven, drying tunnel, vacuum drier, or any other suitable drying equipment at a temperature. Thereafter the strip formed on the carrier is peeled off the carrier surface and cut into pieces of suitable size and shape for consumer use and packed into a suitable container.

[0051] To use the whitening strip for the present invention, the strip when applied to the tooth surface will adhere to the teeth in an appropriate manner and within 1 to 60 minutes, the tooth surfaces will whiten to a natural appearance as the whitening particulates present in the

31

strip matrix migrate to the tooth surfaces. In this regard, the whitening strip is formed to have a width dimension suitable to cover one or more teeth in a row (upper or lower). Therefore, the whitening strip may be applied to one or more of the upper set of teeth, or to one or more of the lower set of teeth either separately or simultaneously. The length dimension of the whitening strip is determined by the amount of coverage desired. In this regard, the number of teeth which it is desired to whiten will determine the dimensions for the whitening strip. For instance, it may be desired to only whiten the front teeth, which are most easily seen by others. Accordingly, the length of whitening strip can be reduced in this case, as compared to the case where it is desired to whiten all of the teeth. The duration of application of whitening strip to the teeth will depend upon the type and concentration of the whitening particulate, as well as the type and intensity of stain. The applied layer of whitening particulate will resist solvation removal by beverages or mastication for at least 2 to 8 hours and generally 3 to 5 hours. After the teeth are whitened to the satisfaction of the user, the portions of the strip can be easily removed by rinsing the mouth with water and brushing.

Paint-On Tooth Whitener

[0052] In one preferred embodiment, the whitening composition is applied using a "paint-on" technique. A small application device, such as a brush or spatula is coated with a composition of this invention and the composition is then placed on a tooth surface. Preferably, the composition is spread evenly on such surfaces, in sufficient quantity to deliver whitening particulates to the stained surfaces.

[0053] The paint-on whitening composition of the present invention is prepared in the form of a flowable viscous liquid suspension containing the whitening particulate and is

32

applied as such to the subject's teeth, by manual application, such as by painting the teeth with a soft applicator brush in the same manner as application of nail polish to a finger nail and without the intervention of a dentist or technological operations. Application by the user and evaporation or dissolution of the solvent leaves an adherent natural appearing white coating on the teeth which provides almost instantaneous whitening of the tooth enamel.

[0054] In various embodiments, the layer of tooth whitening composition applied to tooth enamel contains no ingredients imparting thereto an unacceptable taste or texture, rendering it unpleasant to the user while adhering strongly to tooth enamel. The composition is sufficiently adherent to tooth enamel to remain on the teeth for the applied whitening composition enabling the applied coating to resist the forces commonly applied by the lips and tongue as well as those forces encountered during normal mastication, as upon the evaporation or dissolution of the solvent in mouth after application a hard coating of whitening particulate forms in about 1 minute which coating is bonded securely to the tooth enamel to which it is applied. While the layer of applied paint-on whitening composition is in place, the user is to refrain from mastication. The whitening composition can be removed as and when required, at will, by an employment of standard oral hygiene procedures such as brushing or by rinsing with an alcoholic mouthwash.

Methods

[0055] A method of imparting whiteness to a tooth in a mammal is provided in one embodiment of the present invention, where the method comprises applying a composition to the tooth. The composition comprises a siloxane pressure sensitive adhesive and a whitening particulate, such as those previously described. In certain embodiments, the siloxane pressure sensitive adhesive comprises a copolymer of polyorganosiloxane and silicone resin. Preferred

36 33

whitening particulates are one or more materials selected from the group consisting of calcium phosphate, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, a copolymer of ethylene/propylene, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof. Other preferred whitening particulates are selected from the group consisting of: tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate, hydroxyapatite and mixtures thereof. The whitening particulate preferably has an average diameter of from at least about 0.5 microns up to about 500 microns.

[0056] In an embodiment, the applying is achieved by contacting a film comprising the tooth whitening composition with a surface of a the tooth. In an alternate embodiment, the applying is achieved by contacting a liquid form of the tooth whitening composition with a surface of the tooth.

[0057] The whitening composition of the present invention is prepared by adding the ingredients of the composition in a suitable vessel such as a stainless steel tank provided with a mixer in one embodiment. In the preparation for the whitening composition, the ingredients are advantageously added to the mixer in the following order: solvent, adhesive materials, hydroxyapatite and any desired flavoring or sweetener. The ingredients are then mixed to form a homogeneous dispersion. When mixed and ready for extrusion or application directly as a paint-on whitener, the composition is a white colored opaque viscous liquid composition.

[0058] The present invention is illustrated by the following examples but is not to be limited thereby.

37 34

Example I

[0059] Formulations for whitening dental strips having the ingredients listed in Table I below.

TABLE I					
Strip Composition	A	B	C	D	E
Ethanol	35.73	31.02	35.73	35.73	0
Ethylacetate	0	0	0	0	37.7
Polyvinylpyrrolidone/ vinyl acetate	8.91	8.68	0	0	6.0
Polyvinylpyrrolidone	0	0	8.91	0	2.9
Hydroxyapatite	19.62	24.32	19.62	19.62	19.6
Colophonium	35.74	31.02	35.74	35.74	31.7
PEG 600	0	4.96	0	0	3.0
Polyox	0	0	0	7.0	0
Water	0	0	0	1.91	0
Total (%)	100.00	100.00	100.00	100.00	100.00

[0060] The strip compositions of Table I can be prepared by slowly adding the adhesive material (such as colophonium, polyvinyl pyrrolidone, polyvinyl pyrrolidone/vinyl acetate, Polyox, PEG 600 or mixtures thereof) into the solvent (ethanol, ethyl acetate) with vigorous stirring to form a translucent and viscous solution. Hydroxyapatite powder can be added to this solution and then thoroughly mixed. The resulting white mixture is cast onto a polyethylene coated kraft paper and should be allowed to dry. A white colored strip is formed which can be readily peeled off from the plate. The dry strip has an approximate thickness of about 0.1 to 0.25 mm.

3/35

Example II

[0061] A series of paint-on whitening compositions can be prepared to contain the ingredients listed in Table III below.

TABLE III						
Liquid Paint-On Compositions						
	F	G	H	I	J	K
BIO-PSA*	50	40	25	50	25	34.9
Ethylacetate	33	48	48	20	45	40
Mineral Oil	2	2	2	—	2	—
Acetin	—	—	—	10	—	—
Hydroxyapatite	5	10	25	20	25	25
Carbopol 974	—	—	—	—	3	0.1

*silicone polymer based pressure sensitive adhesive

[0062] The compositions can be painted on tooth surfaces to impart a natural white appearance to the teeth. It is preferred that the paint-on composition remains on the tooth surface for about 3 to 8 hours before removing the coating.

84 36

CLAIMS

What is claimed is:

1. A rapid tooth whitening composition for imparting a natural white appearance to dental enamel comprising an adhesive and a whitening particulate comprising hydroxyapatite.
2. A composition according to Claim 1, wherein the composition contains from about 0.1 to about 99% by weight of the adhesive, and from about 0.5 to about 60% by weight of hydroxyapatite.
3. A composition according to Claim 1, wherein said adhesive comprises a polyorganosiloxane polymer.
4. A composition according to Claim 1, wherein said adhesive comprises a siloxane pressure sensitive adhesive.
5. A composition according to Claim 1, wherein said adhesive comprises a silicone resin.
6. A composition according to Claim 1, wherein said adhesive comprises a polymer selected from the group consisting of natural resins, modified natural resins and pressure sensitive adhesives.
7. A composition according to Claim 1, wherein said adhesive comprises a polymer selected from the group consisting of polyvinylpyrrolidone, polyvinylpyrrolidone/vinyl acetate copolymers and polyethylene glycol.
8. A dental strip comprising a layer comprising the composition according to Claim 1, wherein said layer is operable to adhere to a surface of a tooth.

9. A liquid tooth whitening composition comprising the composition according to Claim 1, wherein the liquid tooth whitening composition adheres to a surface of a tooth.
10. A method for whitening the surface of a tooth comprising applying a composition according to Claim 1 to a surface of the tooth.
11. A rapid tooth whitening composition for imparting a natural white appearance to dental enamel comprising a siloxane pressure sensitive adhesive and a whitening particulate.
12. A composition according to Claim 11, wherein said whitening particulate is comprised of one or more materials selected from the group consisting of calcium phosphate, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, a copolymer of ethylene/propylene, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof.
13. A composition according to Claim 11, wherein said whitening particulate is selected from the group consisting of: tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate, hydroxyapatite and mixtures thereof.
14. A composition according to Claim 11, wherein said siloxane pressure sensitive adhesive comprises a copolymer of polyorganosiloxane and silicone resin.
15. A composition according to Claim 9, wherein said whitening particulate has an average diameter of from at least about 0.5 microns up to about 500 microns.
16. A method of imparting whiteness to a tooth in a mammal, the method comprising applying to the tooth a composition comprising a siloxane pressure sensitive adhesive and a whitening particulate.
17. A method according to Claim 16, wherein said applying is achieved by contacting a film comprising said tooth whitening composition with a surface of a the tooth.

18. A method according to Claim 16, wherein said applying is achieved by contacting a liquid form of said tooth whitening composition with a surface of the tooth.
19. A method according to Claim 16, wherein said whitening particulate is comprised of one or more materials selected from the group consisting of calcium phosphate, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, a copolymer of ethylene/propylene, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof.
20. A method according to Claim 16, wherein said whitening particulate is selected from the group consisting of: tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate, hydroxyapatite and mixtures thereof.
21. A method according to Claim 16, wherein said siloxane pressure sensitive adhesive comprises a copolymer of polyorganosiloxane and silicone resin.
22. A method according to Claim 16, wherein said whitening particulate has an average diameter of from at least about 0.5 microns up to about 500 microns.

(19) Organización Mundial de Propiedad
Intelectual
Oficina Internacional



(43) Fecha de Publicación Internacional
24 de febrero de 2005 (24.02.2005)

PCT

(10) Número de Publicación Internacional
WO 2005/016298 A3

- (51) Clasificación Internacional de Patentes: A61K 7/16
- (21) Numero de Solicitud Internacional:
PCT/US2004/026421
- (22) Fecha de Presentación Internacional:
13 de agosto de 2004 (13.08.2004)
- (25) Lenguaje de entrega: Inglés
- (26) Lenguaje de Publicación: Inglés
- (30) Datos de la Prioridad:
10/641,983 15 de agosto de 2003 (15.08.2003) US
10/915,124 10 de agosto de 2004 (10.08.2004) US
- (71) Solicitante (para todos los estados designados
excepto US): COLGATE-PALMOLIVE COMPANY
[US/US]; 300 Park Avenue, New York, NY 10022
(US)
- (72) Inventores; e
- (75) Inventores/solicitantes (solo para US): IBRAHIM,
Sayed [US/US]; 152 Kingsberry Drive, Somerset,
New Jersey 08873 (US). CHOPRA, Suman, K.
[US/US]; 505 major Road, Dayton, new Jersey
08810 (US). PRENCIPE, Michael [US/US]; 39
Spruce Street, West Windsor, New Jersey 08550
(US)
- (74) Agente: BULLOCK, Kristyne, A.; Colgate-
Palmolive Company, 909 River Road, Casilla Postal
1343, Placataway, NJ 08855-1343 (US).
- (81) Estados Designados (a menos que se indique lo
contrario, para todo tipo de protección nacional
disponible): AE, AG, AL, AM, AT, AU, AZ, BA, BB,,
BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ,

- DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HY, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MAMD, MG, MK,
MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO,
RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT,
TZ, UAM UG, UZ, VN, YU, ZA, ZM, ZW.
- (84) Estados Designados (a menos que se indique lo
contrario, para todo tipo de protección regional
disponible): ARIPO (GH, GM, KE, LS, MW, MZ, SD,
SL, SZ, TZ, UG, ZM, ZW), Euroasiática (AM, AZ,
BY, KG, KZ, MD, RU, TJ, TM), Europea (AT, BE,
BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR,
IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI (BF, BJ,
CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,
SN, TD, TG).

Declaraciones bajo la Regla 4.17:

- en cuanto al derecho del solicitante para solicitar y que se
le conceda una patente (Regla 4.17(ii)) para todas las
designaciones.
- en cuanto al derecho del solicitante a reivindicar la
prioridad de la solicitud más temprana (Regla 4.17(iii))
para todas las designaciones

Publicado:

- con el Informe de búsqueda internacional
- antes del vencimiento de la fecha límite para corregir las
reivindicaciones y a ser republicada en el evento de recibir
las correcciones

- (88) Fecha de publicación del Informe de búsqueda
Internacional:

2 de junio de 2005

Para códigos de dos letras y otras abreviaciones, referirse a
las "Notas de guía sobre Códigos y Abreviaturas" que
aparecen al comienzo de cada edición de la Gaceta del PCT

(54) Título: COMPOSICIÓN PARA EL BLANQUEADO TEMPORAL Y RAPIDO DE LOS DIENTES

(57) Resumen: Una composición para un blanqueado rápido, temporal de dientes que comprende un material
adhesivo y particulados blanqueadores.

✓ 40

COMPOSICIÓN PARA EL BLANQUEADO TEMPORAL Y RÁPIDO DE LOS DIENTES

RESUMEN

Una composición para el blanqueado temporal y rápido de los dientes que incluye un material adhesivo y partículas blanqueadoras.

44/12
21

COMPOSICIÓN PARA EL BLANQUEADO TEMPORAL Y RÁPIDO DE LOS DIENTES

REFERENCIA CRUZADA CON SOLICITUDES RELACIONADAS

La presente solicitud es una continuación parcial de la Solicitud de Patente de los Estados Unidos de América No. 10/641.963, consignada el 15 de agosto de 2003 y cuya revelación se encuentra incorporada por referencia en este documento.

INTRODUCCIÓN

La presente invención se relaciona con sistemas para el blanqueado rápido de los dientes. Las representaciones de la presente invención incluyen composiciones para el blanqueado de los dientes que están conformadas por partículas blanqueadoras y por agentes adhesivos.

Muchas de las sustancias, por ejemplo, el té y el café, a las que se expone o pone en contacto una persona a diario pueden "manchar" o disminuir la "blancura" de sus dientes. Los consumidores estiman que los dientes blancos y limpios son estéticamente convenientes. Los dientes manchados y de un aspecto opaco son objetados por la mayoría de la gente, tanto en términos del aspecto cosmético como desde el punto de vista social, al constituir una indicación de una higiene oral pobre. Aquellas personas cuyos dientes son blancos pueden gozar de mayor seguridad y satisfacción personal y pueden inclusive gozar de mayor aceptación social.

El arte previo da a conocer la utilización de composiciones dentales en gel que contienen ingredientes activos que liberan oxígeno tales como peróxido de hidrógeno, peróxido de urea, percarbonatos y perboratos de metales alcalinos y alcalinotérmeos, para el blanqueado de los dientes. Aún cuando pueden ser efectivamente utilizadas para el blanqueado de los dientes, estas composiciones en gel requieren de múltiples aplicaciones del gel durante un período de una a dos

4/3
12

semanas para lograr el efecto blanqueador deseado y, en algunos casos, requieren que sea un profesional capacitado quien lo aplique. Sin embargo, en numerosas circunstancias resulta deseable mejorar cosméticamente el aspecto de los dientes, es decir, blanquear los dientes rápida y temporalmente en anticipación inmediata a una importante aparición pública o evento social.

Existe la necesidad continua de disponer de un sistema para el blanqueado temporal y rápido de los dientes que pueda ser aplicado de forma segura por el usuario y sin la necesidad de contar con personal especializado especialmente entrenado. El sistema para el blanqueado de los dientes debe estar en la capacidad de ser fácilmente aplicado a los dientes y, una vez aplicado, debe estar en la capacidad de resistir la remoción producto de la masticación o solvatación de los alimentos y bebidas durante un período de al menos 5 a 8 horas; sin embargo, debe estar en la capacidad de ser fácilmente removido por el usuario sin ocasionar daños a su dentadura. En este respecto y conforme se da a conocer en, por ejemplo, la US 4.021.915, 4.032.627, 4.482.535 y 6.210.163, el arte previo da a conocer recubrimientos para el blanqueado de la dentadura que pueden ser aplicados a los dientes en la forma de un asistente de belleza que logra un blanqueado temporal e inmediato al ser aplicado al esmalte dental de la misma manera en la que se aplicaría un esmalte de uñas. Sin embargo, existe la necesidad de disponer de composiciones mejoradas para el blanqueado temporal que sean efectivas y duraderas y que le impartan un aspecto "natural" a los dientes de los usuarios.

RESUMEN

En una representación, la presente invención proporciona una composición para el blanqueado rápido de los dientes que es utilizada para impartirle un aspecto blanco y natural al esmalte dental. Esta composición está conformada por un adhesivo y por un material particulado blanqueador que contiene hidroxiapatita.

46 4
43

En una representación de la presente invención, la composición para el blanqueado rápido de los dientes que es utilizada para impartirle un aspecto blanco y natural al esmalte dental está conformada por un adhesivo a base de siloxano que es sensible a la presión y por un material particulado blanqueador.

En otra representación, la presente invención proporciona un método para impartirle blancura a los dientes de un mamífero. Este método comprende la aplicación a los dientes de una composición que está conformada por un adhesivo a base de siloxano que es sensible a la presión y por un material particulado blanqueador.

Se ha descubierto que las composiciones y métodos de la presente invención ofrecen ventajas con respecto a las composiciones de blanqueado temporal conocidas en el arte, lo que incluye una o más de las siguientes: mejor eficacia del blanqueado y estética y mejor adherencia de la composición blanqueadora a la superficie de los dientes en la presencia de saliva. Otros usos, beneficios y representaciones de la presente invención resultarán evidentes a partir de la descripción incluida en este documento.

DESCRIPCIÓN

Las siguientes definiciones y lineamientos no limitantes deben ser tomados en consideración al evaluar la descripción de la presente invención aquí incluida. Los títulos (por ejemplo, "Introducción" y "Resumen") y los subtítulos (tales como, por ejemplo, "Composiciones Blanqueadoras" y "Métodos") utilizados en el presente documento tienen como único fin la organización general de los temas incluidos en la revelación de la invención y no se prevé que limiten dicha revelación de la invención o cualquier aspecto de la misma. En particular, el tema descrito bajo la "Introducción" puede incluir aspectos tecnológicos que se ubican dentro del alcance de la invención y puede no constituir una discusión del arte previo. El tema tratado en el "Resumen" no es una revelación completa o exhaustiva de la totalidad del alcance de la

invención o de cualquier representación de la misma. La clasificación o discusión de un material dentro de una sección de la presente especificación como poseedor de una utilidad en particular (por ejemplo, como un ingrediente "activo" o como un ingrediente de "transporte") tiene fines meramente de conveniencia y no se debe hacer inferencia alguna en cuanto a que el material debe necesaria o únicamente funcionar de acuerdo con su presente clasificación al ser utilizado en cualquier composición determinada.

La cita de referencias en el presente documento no constituye una admisión que esas referencias corresponden al arte previo o que tienen importancia alguna en lo que respecta a la patentabilidad de la invención dada a conocer en el mismo. Cualquier discusión del contenido de las referencias citadas en la Introducción tiene como único fin presentar un resumen general de las aseveraciones realizadas por los autores de las mismas y no constituye una admisión en lo que respecta a la precisión del contenido de tales referencias. Todas las referencias citadas en la sección Descripción de la presente especificación se encuentran incorporadas en su totalidad por referencia.

Aún cuando son indicativos de las representaciones de la invención, la descripción y los ejemplos específicos tienen fines meramente ilustrativos y no se prevé que limiten el alcance de la misma. Adicionalmente, no se prevé que la descripción de las diversas representaciones con características específicas excluya otras representaciones que tengan características adicionales u otras representaciones que incorporen diferentes combinaciones de las características especificadas. Los Ejemplos Específicos son incluidos con fines ilustrativos de cómo preparar y utilizar las composiciones y métodos de la presente invención y, a no ser que explícitamente se indique lo contrario, no se prevé que constituyan una indicación que ciertas representaciones de la presente invención han o no sido preparadas o evaluadas.

Tal y como son utilizadas en el presente documento, las palabras "preferente" y

42-6
AS

“preferiblemente” se refieren a representaciones de la invención que, bajo determinadas circunstancias, ofrecen ciertos beneficios. Sin embargo, otras representaciones pueden ser igualmente preferentes, bajo las mismas o diferentes circunstancias. Adicionalmente, la descripción de una o más representaciones preferentes no implica que las demás representaciones no sean de utilidad y no se prevé que excluya otras representaciones del alcance de la invención.

Tal y como es utilizada en este documento, se prevé que la palabra “incluye” y sus variaciones no sean limitantes, de forma tal que la descripción de los elementos presentes en una lista no implica la exclusión de otros elementos similares que puedan ser igualmente útiles en los materiales, composiciones, dispositivos y métodos de la presente invención.

A no ser que se especifique lo contrario, todos los porcentajes constitutivos a los que se hace referencia en este documento están expresados en peso con respecto a la totalidad de la composición.

Composiciones para el Blanqueado de los Dientes

De acuerdo con diversas representaciones de la presente invención, se proporciona una composición blanqueadora que es utilizada para impartirle un aspecto blanco y natural a la superficie de los dientes. La superficie de los dientes está generalmente conformada por esmalte dental y la composición blanqueadora se pone en contacto y preferiblemente adhiere al esmalte dental a los efectos de impartirle un efecto blanqueador discernible e inmediato, alterando de este modo y de forma rápida el color de la superficie de los dientes. La presente invención proporciona métodos para blanquear la superficie de los dientes mediante la utilización de las composiciones de acuerdo con la presente invención. El término “diente” o “dientes” al que se hace referencia en el presente documento se refiere a dientes naturales, dentaduras, dentaduras postizas, empastados, coronas, puentes, implantes dentales y similares,

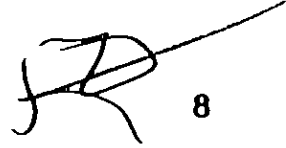
487
AB

así como a cualquier otra prótesis dental de superficie rígida que esté permanente o temporalmente fijada en el interior de la cavidad oral. Tal y como es utilizado en el presente documento, el término "blanqueado" se refiere a un cambio en el aspecto visual de un diente, preferiblemente de forma tal que el diente tenga una tonalidad más brillante. El incremento en la blancura de una superficie dental puede ser apreciado visualmente, por ejemplo, con la ayuda de medidores o gráficas para la comparación del color, o puede ser medido por colorimetría utilizando cualquier instrumento adecuado tal como un Cromámetro Minolta, por ejemplo, el modelo CR-400 (Minolta Corp., Ramsey, NJ). El instrumento puede ser, por ejemplo, programado para medir los valores Hunter Lab o los valores $L^*a^*b^*$ de acuerdo con la norma establecida por el Comité Internacional de Iluminación (CIE). El sistema $L^*a^*b^*$ proporciona una representación numérica del espacio tridimensional del color donde L^* representa un eje de claridad, a^* representa un eje verde-rojo y b^* representa un eje azul-amarillo. Los ejes L^* y b^* típicamente son de mayor aplicabilidad en la medición de la blancura de los dientes. El incremento en la blancura puede ser calculado a partir de las diferencias en los valores de L^* , a^* y b^* antes y después de llevar a cabo el tratamiento o entre superficies tratadas y no tratadas. ΔE^* es un parámetro de utilidad y el mismo es calculado como la raíz cuadrada de la suma de los cuadrados de las diferencias en los valores de L^* , a^* y b^* utilizando la siguiente fórmula:

$$\Delta E^* = [(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]^{1/2}$$

Un valor superior de ΔE^* es indicativo de un mayor incremento en la blancura. En diversas representaciones, el método de la presente invención puede lograr un ΔE^* de al menos aproximadamente 1 o de al menos alrededor de 3 o de al menos aproximadamente 4 o de al menos alrededor de 5.

En una representación de la presente invención, la composición blanqueadora está conformada por un adhesivo y por un material particulado blanqueador. Tal y como


8
42

apreciarán aquellos diestros en este arte, la composición blanqueadora puede incluir ingredientes adicionales. La composición blanqueadora puede ser incorporada en una película o cinta dental o en un producto líquido que puede ser aplicado de forma manual a la superficie de un diente. En otra representación, se proporcionan los métodos para blanquear la superficie de un diente.

Adhesivos

En diversas representaciones de la presente invención, la composición blanqueadora incluye un adhesivo, el cual cumple diversas funciones, lo que incluye el mejoramiento de la adherencia de la composición blanqueadora a la superficie del diente que va a ser blanqueado. En estas representaciones, el adhesivo generalmente incluye uno o más polímeros orgánicos o copolímeros que se encuentran dispersos o disueltos en un solvente volátil.

Se puede utilizar una variedad de polímeros orgánicos como adhesivos en la presente invención. Por ejemplo, un tipo preferente de polímeros adhesivos incluye los polímeros a base de siloxano, los cuales son igual y generalmente conocidos en este arte como polímeros de "silicona". En ciertas representaciones de la presente invención, los polímeros adhesivos presentes en la composición son aquellos en los cuales se puede dispersar un material particulado blanqueador y éstos son ampliamente conocidos en este arte. Muchos de estos polímeros de silicona se encuentran disponibles a nivel comercial. En diversas representaciones, el polímero adhesivo a base de silicona que se prefiere utilizar es un poliorganosiloxano. Este poliorganosiloxano es producido mediante la condensación de una resina de silicona y un organosiloxano, por ejemplo, un polidiorganosiloxano. Estos polímeros son un material adherente y elastomérico, cuya adhesión a las superficies del esmalte dental puede ser variada por medio de la alteración de la proporción entre la resina de silicona y el polidiorganosiloxano presentes en la molécula del copolímero. Los polímeros preferiblemente son polímeros sensibles a la presión que están

específicamente diseñados para uso farmacéutico, son permeables a numerosos fármacos y pueden ser utilizados en la aplicación transdérmica de diversos compuestos. En una representación, los polímeros de silicona son el producto copolimérico de mezclar un polidiorganosiloxano que termina en silanol, por ejemplo, polidimetilsiloxano, con una resina de silicona contentiva de silanol, donde los grupos silanol del polidiorganosiloxano sufren una reacción de condensación con los grupos silanol de la resina de silicona, de forma tal que el polidiorganosiloxano se ve ligeramente entrecruzado por la resina de silicona (es decir, las cadenas del polidiorganosiloxano se unen entre sí a través de las moléculas de la resina a los fines de lograr la ramificación de las cadenas y enredamiento y/o una cantidad menor de carácter reticulado) con el objeto de formar los polímeros de silicona. Se puede mezclar un catalizador, por ejemplo, un material alcalino tal como amoníaco, hidróxido de amonio o carbonato de amonio, con el polidiorganosiloxano que concluye con silanol y la resina de silicona, a los efectos de promover esta reacción de encadenamiento cruzado. La copolimerización de la resina de silicona con el polidiorganosiloxano que concluye con silanol tiene como resultado un polímero que tiene propiedades autoadherentes y las propiedades de cohesión de una matriz elastomérica blanda que es característica de los polímeros sensibles a la presión y que se diferencian de las propiedades no elastoméricas y rígidas de otras resinas de silicona. En una representación, los polímeros adhesivos que son utilizados en la composición blanqueadora son comercializados por Dow-Corning Company bajo la marca BIO-PSA.

La modificación de la proporción entre la resina de silicona y el polidiorganosiloxano modifica la adhesión del polímero hidrofílico. Esta proporción puede ubicarse en el rango comprendido entre aproximadamente 70:30 y alrededor de 50:50. Por ejemplo, la silicona BIO-PSA que es comercializada por Dow-Corning se encuentra disponible en tres proporciones entre la resina de silicona y el polímero de silicona, a saber: 65/35 (baja adherencia), 60/40 (adherencia media) y 55/45 (elevada adherencia). En

algunas representaciones de acuerdo con la invención, la composición para el blanqueado rápido de los dientes contiene un adhesivo orgánico que está disperso o disuelto en el solvente volátil. Por ejemplo, se dispone de un adhesivo a base de poliorganosiloxano sensible a la presión disuelto en acetato de etilo como solvente o en dimeticona.

En otras representaciones de la presente invención, los polímeros que pueden ser utilizados como adhesivos incluyen aquellos tales como los Carbómeros, por ejemplo, los polímeros de carboximetileno, lo que incluye los polímeros a base de ácido acrílico y los copolímeros de ácido acrílico. El carboxipolimetileno es un polímero de vinilo ligeramente ácido que incluye grupos activos carboxilo. Un carboxipolimetileno que se prefiere utilizar en la puesta en práctica de la presente invención es un copolímero de ácido acrílico entrecruzado con aproximadamente 0,75% y alrededor de 1,5% de sucrosa de polialilo que es comercializado por B. F. Goodrich bajo la designación comercial de Carbopol 934, 974. El adhesivo preferiblemente es una resina natural, en particular una resina que es seleccionada a partir de las resinas de laca, las resinas de colofonio y las resinas modificadas de colofonio. Otro grupo adecuado de adhesivos lo constituyen las composiciones poliméricas orgánicas que están representadas por el grupo conformado por las resinas alquidáticas, los acetaldéhdos de polivinilo, los alcoholes de polivinilo, los acetatos de polivinilo, el poli(óxido de etileno), los poliacrilatos, las resinas de cetona, la polivinilpirrolidona, el copolímero de polivinilpirrolidona/acetato de vinilo, los polietilenglicoles de un peso molecular de entre 200 y 1.000, los copolímeros en bloques de polioxietileno/polioxipropileno (Polyox) y las resinas de silicona. Tal y como apreciarán aquellos diestros en este arte, los polímeros adhesivos pueden incluir copolímeros o mezclas de polímeros, lo que incluye los polímeros adhesivos descritos en el presente documento.

En diversas representaciones, el polímero adhesivo está presente en las

composiciones blanqueadoras líquidas de la presente invención a una concentración de entre aproximadamente 1 y alrededor de 80% en peso, preferiblemente de entre aproximadamente 15 y alrededor de 40% en peso.

Vehículo Volátil

Ciertas representaciones de la presente invención incluyen vehículos, en especial aquellas composiciones blanqueadoras que están en solución líquida. Algunos de los vehículos adecuados que pueden ser utilizados en la preparación de las composiciones blanqueadoras de la presente invención incluyen los solventes volátiles tales como agua, etanol y acetato de etilo y los solventes no volátiles y solubles en agua tales como triacetina. El solvente en el cual se dispersa la partícula blanqueadora está generalmente presente en la composición a una concentración de entre aproximadamente 10 y alrededor de 80% en peso, preferiblemente de entre aproximadamente 40 y alrededor de 70% en peso.

Partículas Blanqueadoras

En diversas representaciones, la composición blanqueadora incluye un material particulado blanqueador. Tal y como es utilizado en el presente documento, el término "partícula blanqueadora" puede abarcar una pluralidad de partículas o de materiales particulados que imparten blancura en la composición blanqueadora. Se debe hacer notar que la pluralidad de partículas puede incluir una o más especies diferentes de materiales particulados de blanqueado que son seleccionados de manera independiente. La selección de múltiples partículas blanqueadoras puede ser de utilidad para modificar la tonalidad global del color de la composición blanqueadora. En diversas representaciones, las partículas blanqueadoras pueden estar representadas por cualquier partícula de color blanco o pigmentada de color blanco tal como, por ejemplo, partículas minerales de color blanco, partículas de óxidos metálicos de color blanco o partículas poliméricas de color blanco. Tal y como

22/ 12 51

es utilizado en este documento, el término "blanco" es considerado un color y un color "blanco" puede ser cualquier color comúnmente percibido como blanco, por ejemplo, los colores establecidos en la escala de blancura de la Gula de Tonalidades Vita o los colores que son percibidos como más blancos que aquellos desplegados en la Gula de Tonalidades Vita.

En diversas representaciones de la presente invención, el diámetro promedio de estas partículas puede ubicarse entre aproximadamente 0,5 μm (micrones) y alrededor de 500 micrones, entre aproximadamente 10 micrones y alrededor de 100 micrones o entre aproximadamente 20 micrones y alrededor de 50 micrones.

En algunas representaciones, las partículas minerales de color blanco pueden incluir un mineral o sal no tóxica que esté en la capacidad de impartir un color blanco. En diversas representaciones, las partículas blanqueadoras pueden incluir un fosfato de calcio. En diversas configuraciones, el fosfato de calcio puede tener una estructura que es seleccionada a partir de fosfato tetracálcico, fosfato de calcio amorfo, fosfato alfa-tricálcico, fosfato beta-tricálcico o hidroxiapatita ($\text{Ca}_5(\text{OH})(\text{PO}_4)_3$). En diversas representaciones, el fosfato de calcio puede ser un fosfato de calcio insoluble y esencialmente acuoso y una forma no cristalina, escasamente cristalina o cristalina tal como, por ejemplo, hidroxiapatita cristalina.

La hidroxiapatita tiene una estructura física que es similar a la del esmalte de los dientes y por ende tiene una fuerte afinidad hacia las superficies del esmalte dental, lo que tiene como resultado que las partículas de hidroxiapatita le impartan un aspecto blanco y "natural" a la superficie del esmalte donde son utilizadas. La preparación de la hidroxiapatita es ampliamente conocida en este arte y es dada a conocer en la U.S. 4.274.879, en la U.S. 4.330.514, en la U.S. 4.324.772, en la U.S. 4.408.300, en la U.S. 4.097.935 y en la U.S. 4.207.300. El agente blanqueador a base de hidroxiapatita está presente en la composición blanqueadora de la presente invención a una concentración de entre aproximadamente 0,5 y alrededor de 60% en

peso, preferiblemente de entre aproximadamente 15 y alrededor de 40% en peso.

Algunos ejemplos no limitantes de hidroxiapatita incluyen la Hidroxiapatita A1 (Himed, Old Bethpage, NY). En algunas configuraciones, las partículas de hidroxiapatita pueden incluir agregados de partículas de hidroxiapatita de menores dimensiones. En un ejemplo no limitante, estos agregados pueden tener un diámetro promedio de entre aproximadamente 100 nm y alrededor de 1.000 nm y están conformados por partículas de hidroxiapatita que tienen un diámetro promedio de entre aproximadamente 0,1 nm y alrededor de 10 nm.

En algunas representaciones, las partículas blanqueadoras pueden estar representadas por un óxido metálico. El óxido metálico puede ser cualquier óxido metálico que aporte un color blanco tal como, por ejemplo, óxido de titanio, óxido de aluminio, óxido de estaño, óxido de calcio, óxido de magnesio, óxido de bario o una combinación de los anteriores.

En algunas representaciones, las partículas blanqueadoras pueden ser partículas poliméricas de color blanco conforme se da a conocer en la Patente de los Estados Unidos de América 6.669.930 otorgada a Hoic. En un ejemplo no limitante, las partículas poliméricas de color blanco pueden incluir polietileno (PE), polipropileno, un copolímero de etileno/propileno, politetrafluoroetileno (PTFE) o polihexafluoropropeno. En un ejemplo no limitante, las partículas poliméricas de color blanco pueden estar representadas por polietileno PE220, por polipropileno o por el PTFE suministrado por PreSperse, Inc., Somerset NJ. En un ejemplo no limitante, las partículas poliméricas blanqueadoras pueden incluir un polímero que tiene un peso molecular promedio ponderado, un peso molecular numérico promedio, un peso molecular Z promedio o un peso molecular promedio en viscosidad de entre aproximadamente 100 y alrededor de 10.000.000, de entre aproximadamente 200 y alrededor de 5.000.000, de entre aproximadamente 500 y alrededor de 1.000.000, de entre aproximadamente 1.000 y alrededor de 500.000, de entre aproximadamente

14
53

10.000 y alrededor de 100.000 o de entre aproximadamente 20.000 y alrededor de 50.000.

En algunas representaciones, las partículas blanqueadoras pueden incluir partículas de aspecto nacarado. En algunas configuraciones, las partículas de aspecto nacarado pueden aportarle un aspecto nacarado de color blanco a una composición de la presente invención. El término "de aspecto nacarado" utilizado en este documento se refiere a una propiedad óptica de un material en la cual el material puede tener un aspecto brillante y del tipo nacarado. En algunas configuraciones, el material de aspecto nacarado puede lograr un efecto de profundidad. En algunos aspectos, el material de aspecto nacarado puede adicionalmente lograr un efecto de brillo. Sin limitarse a la teoría, se estima que las partículas de aspecto nacarado parcialmente reflejan y refractan la luz incidente. El grado de reflexión o refracción parcial de la luz incidente por parte de un material de aspecto nacarado puede depender del ángulo de incidencia de la luz y/o del ángulo de visualización. Las partículas de aspecto nacarado que son utilizadas en las composiciones descritas en el presente documento pueden lograr efectos cosméticos o estéticos tales como, por ejemplo, brillo o lustro.

Las partículas de aspecto nacarado pueden incluir un único mineral o especie química tal como, por ejemplo, un silicato tal como mica, u oxiclورو de bismuto. El término "mica" significa cualquiera de un grupo de minerales acuosos a base de silicato de aluminio que tienen una morfología laminada y una perfecta división basal (micácea). La mica puede, por ejemplo, ser mica plana, residuos de mica o escamas de mica, cuyos ejemplos incluyen las micas tipo muscovita, biotita o flogopita. En algunas representaciones, las partículas de aspecto nacarado pueden estar conformadas por un complejo que incluye más de un mineral o especie química tal como, por ejemplo, mica recubierta con un óxido metálico tal como óxido de titanio. Las partículas de aspecto nacarado pueden igualmente ser de origen biológico, por

54 15 54

ejemplo, escamas o madre perla. Ciertas partículas de aspecto nacarado de origen biológico pueden incluir carbonato de calcio tales como, por ejemplo, las perlas, las conchas de moluscos tales como la madre perla que son obtenidas a partir de las conchas de ostras, o el nácar.

En algunas representaciones, las partículas de aspecto nacarado y de color blanco pueden, por ejemplo, ser aquellas descritas como pigmentos Timiron®, polvos Biron®, dispersiones Biron® o dispersiones Nailsyn® (todas marcas comerciales registradas de EM Industries, Inc., Hawthorne, NY, división de E. Merck). Por ejemplo, las partículas de titanio y mica pueden ser partículas de aspecto nacarado tales como las partículas Timiron®. Las partículas de titanio y mica de aspecto nacarado y de color blanco pueden, por ejemplo, ser partículas "Silverwhite" Timiron® tales como Starluster MP-115 Timiron®, Supersheen MP-1001 Timiron®, Sparkle MP-47 Timiron®, Supersilk MP-1005 Timiron®, Pearl Flake MP-10 Timiron®, Pearl Sheen MP-30 Timiron®, Super Silver Fine Timiron®, Gleamer Flake MP-111 Timiron®, Ultraluster MP-45 Timiron®, Transwhite MP-18 Timiron®, Diamond Cluster MP-149 Timiron®, Super Silver Timiron®, Stardust MP-80 Timiron®, Arctic Silver Timiron® o Snowflake MP-99 Timiron®.

Un fluido para el recubrimiento de los dientes de la presente invención puede incluir partículas blanqueadoras a entre aproximadamente 0,01% (p/p) y alrededor de 50% (p/p), a entre aproximadamente 0,1% (p/p) y alrededor de 20% (p/p), a entre aproximadamente 1% (p/p) y alrededor de 19% (p/p), a entre aproximadamente 2% (p/p) y alrededor de 18% (p/p), a entre aproximadamente 3% (p/p) y alrededor de 17% (p/p), a entre aproximadamente 4% (p/p) y alrededor de 16% (p/p) o a entre aproximadamente 6% (p/p) y alrededor de 15% (p/p). En algunas configuraciones, las partículas blanqueadoras (lo que incluye las partículas de aspecto nacarado) pueden tener un tamaño promedio de entre aproximadamente 0,01 micrones y alrededor de 500 micrones, de entre aproximadamente 0,5 micrones y alrededor de

100 micrones o de entre aproximadamente 2 micrones y alrededor de 20 micrones de diámetro o una dimensión superior. Se prevé que las partículas a las que se hace referencia en el presente documento incluyan las partículas primarias, al igual que los agregados de partículas.

La pluralidad de partículas blanqueadoras puede estar independientemente conformada por un material que es seleccionado a partir del grupo conformado por los compuestos a base de fosfato de calcio, óxido de titanio, óxido de aluminio, óxido de estaño, óxido de calcio, óxido de magnesio, polietileno, polipropileno, un copolímero de etileno/propileno, politetrafluoroetileno, polihexafluoropropeno y combinaciones de los anteriores. En una representación, la pluralidad de partículas blanqueadoras puede incluir un fosfato de calcio tal como una hidroxiapatita, en particular una hidroxiapatita cristalina.

Ingredientes Adicionales

En algunas representaciones, se utiliza un material edulcorante en la composición para el blanqueado de los dientes de la presente invención. Los agentes edulcorantes que pueden ser utilizados incluyen la sacarina de sodio, el ciclamato de sodio, el xilitol, el aspartame y similares, en concentraciones de entre aproximadamente 0,01 y alrededor de 1% en peso, preferiblemente de entre aproximadamente 0,05 y alrededor de 0,75% en peso. Se prefiere utilizar sacarina de sodio en ciertas representaciones.

En diversas representaciones, las composiciones para el blanqueado de los dientes de la presente invención opcionalmente incluyen un agente de sabor. Los agentes de sabor que son utilizados en estas representaciones incluyen los aceites esenciales al igual que diversos aldehídos, ésteres, alcoholes y materiales similares que aportan sabor. Algunos ejemplos de estos aceites esenciales incluyen los aceites de menta verde, menta, gaulteria, safrán, clavo, salvia, eucalipto, mejorana, canela, limón,

87/17
56

lima, toronja y naranja. Los compuestos químicos tales como mentol, carvona y anetol también son de utilidad. De los anteriores, los que son más comúnmente utilizados son los aceites de menta, menta verde y gaulteria. El agente de sabor es incorporado en la composición líquida de blanqueado de la presente invención a una concentración de entre aproximadamente 0,1 y alrededor de 2% en peso, preferiblemente de entre aproximadamente 0,1 y alrededor de 0,5% en peso.

Las composiciones de la presente invención opcionalmente incluyen un agente antimicrobiano (por ejemplo, antibacteriano). Se puede utilizar cualquier agente antimicrobiano oralmente aceptable, lo que incluye el Triclosán (5-cloro-2-(2,4-diclorofenoxi)fenol), la 8-hidroxiquinolina y sus sales, las fuentes de zinc y de hierro estañoso tales como citrato de zinc, sulfato de zinc, glicinato de zinc, zinc-citrato de sodio y pirofosfato estañoso, los compuestos a base de cobre (II) tales como cloruro, fluoruro, sulfato e hidróxido de cobre (II), el ácido ftálico y sus sales tales como ftalato monopotásico de magnesio, la sanguinarina, los compuestos a base de amonio cuaternario tales como los cloruros de alquilpiridinio (por ejemplo, cloruro de cetilpiridinio (CPC), las combinaciones de CPC con zinc y/o enzimas, cloruro de tetradecilpiridinio y cloruro de N-tetradecil-4-etilpiridinio), las bisguanidas tales como digluconato de clorhexidina, hexetidina, octenidina y alexidina y los compuestos bifenólicos halogenados tales como 2,2' metilenobis-(4-cloro-6-bromofenol), el cloruro de benzalconio, la salicilanilida, el bromuro de domifeno, el yodo, las sulfonamidas, las bisbiguanidas, los compuestos fenólicos, los derivados del piperidino tales como delmopinol y octapinol, el extracto de magnolia, el extracto de semillas de uva, el timol, el eugenol, el mentol, el geraniol, el carvacrol, el citral, el eucaliptol, el catecol, el 4-alil-catecol, el hexilresorcinol, el salicilato de metilo, los antibióticos tales como augmentin, amoxicilina, tetraciclina, doxiciclina, minociclina, metronidazol, neomicina, kanamicina y clindamicina, así como las mezclas de los anteriores. La Patente de los Estados Unidos de América 5.776.435, otorgada a Gaffar y colaboradores en fecha 7 de julio de 1.998, incluye otra lista ilustrativa de agentes antimicrobianos que resultan

de utilidad.

Las composiciones de la presente invención opcionalmente incluyen un antioxidante. Se puede utilizar cualquier antioxidante oralmente aceptable, lo que incluye el hidroxianisol butilado (BHA), el hidroxitolueno butilado (BHT), la vitamina A, los carotenoides, la vitamina E, los flavonoides, los polifenoles, el ácido ascórbico, los antioxidantes herbarios, la clorofila, la melatonina y mezclas de los anteriores.

Las composiciones de la presente invención opcionalmente incluyen un agente estimulador de la formación de saliva que es, por ejemplo, de utilidad en el mejoramiento de la resequedad bucal. Se puede utilizar cualquier agente estimulador de la formación de saliva que sea oralmente aceptable, lo que entre otros incluye los ácidos alimentarios tales como los ácidos cítrico, láctico, málico, succínico, ascórbico, adípico, fumárico y tartárico y las mezclas de los anteriores. Uno o más agentes estimuladores de la formación de saliva están opcionalmente presentes en una cantidad total que resulte efectiva para lograr la estimulación de la formación de saliva.

Las composiciones de la presente invención opcionalmente incluyen un agente para refrescar el aliento. Se puede utilizar cualquier agente para refrescar el aliento que sea oralmente aceptable, lo que entre otros incluye las sales de zinc tales como gluconato de zinc, citrato de zinc y cloruro de zinc, la α -ionona y mezclas de los anteriores. Uno o más agentes para refrescar el aliento están opcionalmente presentes en una cantidad total que resulte efectiva para lograr refrescar el aliento.

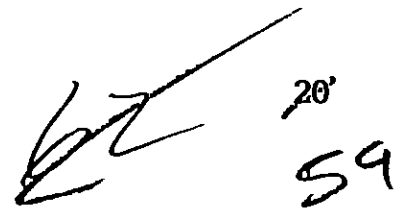
Las composiciones de la presente invención opcionalmente incluyen un agente contra la placa (por ejemplo, un agente para la disolución de la placa). Se puede utilizar cualquier agente contra la placa que sea oralmente aceptable, lo que entre otros incluye las sales de estaño, cobre, magnesio y estroncio, los copolíoles de dimeticona tales como copoliol de cetildimeticona, la papaína, la glucoamilasa, la

glucosa oxidasa, la urea, el lactato de calcio, el glicerofosfato de calcio, los poliacrilatos de estroncio y las mezclas de los anteriores.

Las composiciones de la presente invención opcionalmente incluyen un agente anti-inflamatorio. Se puede utilizar cualquier agente anti-inflamatorio que sea oralmente aceptable, lo que incluye los agentes esteroideos tales como flucinolona e hidroclotisona, al igual que los agentes no esteroideos (AINEs) tales como ketorolac, flurbiprofeno, ibuprofeno, naproxeno, indometacina, diclofenac, etodolac, indometacina, sulindac, tolmetin, ketoprofeno, fenoprofeno, piroxicam, nabumetona, aspirina, diflunisal, meclofenamato, el ácido mefenámico, oxifenbutazona, fenilbutazona y las mezclas de los anteriores.

Las composiciones de la presente invención opcionalmente incluyen un antagonista del receptor H₂. Los antagonistas del receptor H₂ que resultan de utilidad en la presente invención incluyen la cimetidina, la etitidina, la ranitidina, el ICIA-5165, la tiotidina, el ORF-17578, la lupitidina, la donetidina, la famotidina, la roxatidina, la pifatidina, la lamtidina, el BL-6548, el BMY-25271, la zaltidina, la nizatidina, la mifentidina, el BMY-52368, el SKF-94482, el BL-6341A, el ICI-162846, la ramixotidina, el Wy-45727, el SR-58042, el BMY-25405, la loxitidina, el DA-4634, la bisfentidina, la sufotidina, la ebrotidina, el HE-30-256, el D-16637, el FRG-8813, el FRG-8701, la impromidina, el L-643728, el HB-408.4 y las mezclas de los anteriores.

Las composiciones de la presente invención opcionalmente incluyen un agente desensibilizante. Los agentes desensibilizantes que resultan de utilidad en la presente invención incluyen el citrato de potasio, el cloruro de potasio, el tartrato de potasio, el bicarbonato de potasio, el oxalato de potasio, el nitrato de potasio, las sales de estroncio y las mezclas de los anteriores. Se puede alternativa o adicionalmente utilizar un analgésico sistémico o local tal como aspirina, codeína, acetaminofén, salicilato de sodio o salicilato de trietanolamina.

Handwritten signature and date "20' 59".

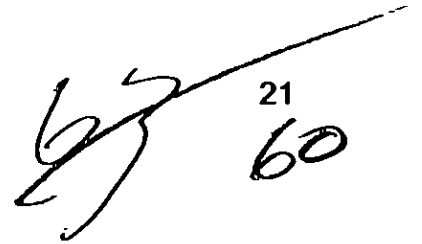
Las composiciones de la presente invención opcionalmente incluyen un nutriente. Los nutrientes que pueden ser utilizados incluyen las vitaminas, los minerales, los aminoácidos y las mezclas de los anteriores. Las vitaminas incluyen las Vitaminas C y D, la tiamina, la riboflavina, el pantotenato de calcio, la niacina, el ácido fólico, la nicotinamida, la piridoxina, la cianocobalamina, el ácido para-aminobenzoico, los bioflavonoides y las mezclas de los anteriores. Los suplementos nutricionales incluyen los aminoácidos (por ejemplo, L-triptófano, L-lisina, metionina, treonina, levocarnitina y L-carnitina), los lipotrópicos (por ejemplo, colina, inositol, betaína y ácido linoleico), el aceite de pescado (lo que incluye los componentes del mismo tales como los ácidos grasos poliinsaturados omega-3 (N-3), el ácido eicosapentaenoico y el ácido docosahexaenoico), la coenzima Q10 y las mezclas de los anteriores.

Las composiciones de la presente invención opcionalmente incluyen biomoléculas tales como bacteriocinas, anticuerpos y proteínas. Las proteínas que pueden ser utilizadas incluyen las proteínas lácteas y las enzimas tales como las enzimas productoras de peróxido, la amilasa, los agentes para la disolución de la placa tales como papaína, glucoamilasa, glucosa oxidasa y las enzimas de "nueva generación".

Las composiciones de la presente invención opcionalmente incluyen ingredientes adicionales tales como amortiguadores de la placa, por ejemplo, urea, lactato de calcio, glicerofosfato de calcio y poliacrilatos de estroncio; extractos de plantas; agentes opacantes y pigmentos y/o agentes colorantes adicionales.

La composición blanqueadora de la presente invención puede ser aplicada al esmalte de los dientes utilizando cualquier medio adecuado tal como, por ejemplo, en forma extruída en la forma de una cinta o en la forma de un líquido tal como un líquido de aplicación directa.

Cinta

 21
60

La composición blanqueadora de la presente invención puede tener la forma de una capa de una cinta que es preparada utilizando un proceso convencional de fundición con disolvente. Entre aquellas que resultan de utilidad en la presente invención, las cintas comprenden polímeros, materiales tejidos naturales y sintéticos, un material no tejido, papel metalizado, papel, caucho y combinaciones de los anteriores. La cinta de material es preferible y esencialmente insoluble en agua. Los polímeros que pueden ser utilizados incluyen el polietileno, el acetato de etilvinilo, los poliésteres, el alcohol etilvinílico, los fluoroplásticos y las combinaciones de los anteriores. En diversas representaciones, la cinta de material generalmente tiene un espesor inferior a aproximadamente 1 mm (milímetro), opcionalmente inferior a aproximadamente 0,05 mm y opcionalmente de entre aproximadamente 0,001 y alrededor de 0,03 mm. La forma de la cinta puede ser cualquier forma y tamaño que cubra la superficie oral deseada. En una representación, la longitud del material de la cinta se ubica entre aproximadamente 2 cm. (centímetros) y alrededor de 12 cm.; en otra representación, la misma se ubica entre aproximadamente 4 cm. y alrededor de 9 cm. El ancho del material de la cinta igualmente dependerá del área superficial oral que va a ser cubierta. El ancho de la cinta generalmente se ubica entre aproximadamente 0,5 cm. y alrededor de 4 cm.; en una representación, este ancho se ubica entre aproximadamente 1 cm. y alrededor de 2 cm. El material de la cinta puede incluir bolsillos poco profundos que son opcionalmente llenados con una composición de la presente invención. Las cintas que resultan de utilidad en la presente invención son dadas a conocer en la Patente de los Estados Unidos de América 6.514.484, otorgada a Rajaiah y colaboradores el 4 de febrero de 2.003.

Por ejemplo, en algunas representaciones, la cinta es preparada por fundición con disolvente. Se disuelve un polímero o resina adhesiva tal como colofonio y/o polivinilpirrolidona, en una cantidad suficiente de un solvente compatible tal como etanol. Luego de formarse una solución, se lleva a cabo la adición de las partículas blanqueadoras en forma pulverizada (por ejemplo, hidroxiapatita) y de cualquier otro

ingrediente, por ejemplo, edulcorantes o agentes de sabor. La solución es colocada sobre un material portador de fundición adecuado del cual la cinta resultante pueda ser fácilmente desprendida sin ocasionarle daños. El material portador debe tener una tensión superficial tal que permita que la solución se esparza uniformemente a lo largo del ancho del vehículo previsto sin colarse y formar un enlace destructivo entre los dos sustratos. Algunos ejemplos de los materiales portadores que pueden ser utilizados incluyen el vidrio, el acero inoxidable, el teflón y el papel kraft impregnado con polietileno. La cinta puede ser secada hasta obtener una forma sólida utilizable en un baño de aire a una temperatura elevada utilizando un horno de secado, un túnel de secado, un secador al vacío o cualquier otro equipo adecuado de secado a una temperatura. La cinta que se formó sobre el vehículo es posteriormente desprendida de la superficie del mismo, es cortada en trozos de un tamaño y forma adecuados para ser utilizados por el consumidor y es empaquetada en un recipiente adecuado.

Para utilizar la cinta blanqueadora de la presente invención, la misma es aplicada a la superficie de la dentadura y se adherirá a los dientes de forma apropiada y en un lapso de entre 1 y 60 minutos. Las superficies de los dientes se blanquearán hasta lograr un aspecto natural a medida que las partículas blanqueadoras presentes en la matriz de la cinta migran hacia las superficies de los dientes. En este respecto, la cinta blanqueadora es configurada de forma tal que tenga un ancho adecuado que le permita cubrir uno o más de los dientes presentes en una hilera (superior o inferior). En consecuencia, la cinta blanqueadora puede ser aplicada a uno o más de los dientes superiores o a uno o más de los dientes inferiores, ya sea de forma independiente o simultáneamente. La dimensión de la longitud de la cinta blanqueadora es determinada por la magnitud de la cobertura deseada. En este respecto, el número de dientes que se desea blanquear determinará las dimensiones de la cinta blanqueadora. Por ejemplo, pudiese ser que se desee blanquear únicamente los dientes anteriores, los cuales son visualizados con mayor facilidad

60 23 62

por los demás. En conformidad, en este caso, la longitud de la cinta blanqueadora puede reducirse, en comparación con el caso donde se desea blanquear la totalidad de los dientes. La duración de la aplicación de la cinta blanqueadora a los dientes dependerá del tipo y concentración de las partículas blanqueadoras, al igual que del tipo e intensidad del manchado. La capa aplicada de partículas blancas resistirá la remoción por solvatación producto de la acción de las bebidas o de la masticación durante un período de al menos 2 a 8 horas, generalmente de entre 3 y 5 horas. Una vez blanqueados los dientes a satisfacción del usuario, los trozos de la cinta pueden ser fácilmente removidos mediante el lavado de la boca con agua y cepillado.

Blanqueador de los Dientes de Aplicación Directa

En una representación preferente, la composición blanqueadora es aplicada utilizando una técnica de "aplicación directa". Un pequeño dispositivo de aplicación, por ejemplo, un cepillo o espátula, es recubierto con una composición de la presente invención y la composición es posteriormente colocada sobre la superficie de los dientes. La composición es preferible y uniformemente extendida sobre tales superficies en una cantidad suficiente como para permitir la liberación de las partículas blanqueadoras sobre las superficies manchadas.

La composición blanqueadora de aplicación directa de la presente invención es preparada en la forma de una suspensión líquida viscosa y fluida que contiene las partículas blanqueadoras y es aplicada como tal a los dientes de la persona de forma manual, por ejemplo, pintando los dientes con un cepillo de aplicación blando de la misma manera en que se aplicaría el esmalte de uñas a una uña y sin la necesidad de que intervenga un dentista o de operaciones tecnológicas. La aplicación por parte del usuario y la evaporación o disolución del solvente deja un recubrimiento adherente de color blanco y de aspecto natural sobre los dientes que logra un blanqueado casi instantáneo del esmalte de los mismos.



En diversas representaciones, la capa de la composición para el blanqueado de los dientes que es aplicada al esmalte dental carece de ingredientes que le impartan una textura o sabor inaceptable que la hagan desagradable para el usuario y se adhiere firmemente al esmalte de los dientes. La composición se adhiere lo suficiente al esmalte dental como para permanecer sobre los dientes de forma tal que la composición blanqueadora que fue aplicada permita que el recubrimiento resultante resista las fuerzas que son comúnmente aplicadas por los labios y la lengua, al igual que aquellas fuerzas que son normalmente aplicadas durante la masticación, ya que, al evaporarse o disolverse el solvente en la boca después de la aplicación, se forma un recubrimiento rígido de partículas blanqueadoras en un plazo de aproximadamente 1 minuto, recubrimiento éste que se une firmemente al esmalte de los dientes sobre los cuales fue aplicado. Mientras la capa de la composición blanqueadora de aplicación directa esté colocada, el usuario debe abstenerse de masticar. La composición blanqueadora puede ser removida de la forma y en el momento deseado mediante la utilización de procedimientos convencionales de higiene oral tales como por cepillado o por lavado con un enjuague bucal alcohólico.

Métodos

En una representación de la presente invención, se proporciona un método para impartirle blancura a los dientes de un mamífero, donde el método comprende la aplicación de una composición a los dientes. La composición está conformada por un adhesivo a base de siloxano que es sensible a la presión y por un material particulado blanqueador tal como aquellos descritos con anterioridad. En ciertas representaciones, el adhesivo a base de siloxano que es sensible a la presión incluye un copolímero de poliorganosiloxano y resina de silicona. Las partículas blanqueadoras que se prefiere utilizar incluyen uno o más materiales que son seleccionados a partir del grupo conformado por fosfato de calcio, óxido de titanio, óxido de aluminio, óxido de estaño, óxido de calcio, óxido de magnesio, polietileno,

67

64

polipropileno, un copolímero de etileno/propileno, politetrafluoroetileno, polihexafluoropropeno y las combinaciones de los anteriores. Otras partículas blanqueadoras que se prefiere utilizar son seleccionadas a partir del grupo conformado por: fosfato tetracálcico, fosfato de calcio amorfo, fosfato alfa-tricálcico, fosfato beta-tricálcico, hidroxiapatita y las mezclas de los anteriores. Las partículas blanqueadoras preferiblemente tienen un diámetro promedio de entre al menos aproximadamente 0,5 micrones y alrededor de 500 micrones.

En una representación, la aplicación es llevada a cabo mediante la puesta en contacto de una película que contiene la composición para el blanqueado de los dientes con la superficie de los dientes. En una representación alternativa, la aplicación es llevada a cabo por medio de la puesta en contacto de una forma líquida de la composición para el blanqueado de los dientes con la superficie de los dientes.

La composición blanqueadora de la presente invención es preparada mediante la adición de los ingredientes de la composición a un recipiente adecuado, por ejemplo, un tanque de acero inoxidable provisto de una mezcladora en una representación. En la preparación de la composición blanqueadora, los ingredientes son ventajosamente agregados a la mezcladora en el siguiente orden: solvente, materiales adhesivos, hidroxiapatita y cualquier agente de sabor o edulcorante deseado. Los ingredientes son posteriormente mezclados con el propósito de formar una dispersión homogénea. Luego de ser mezclada y de estar lista para su extrusión o aplicación directa en la forma de un blanqueador de aplicación directa, la composición es una composición líquida, viscosa, opaca y de color blanco.

La presente invención es ilustrada haciendo uso de los siguientes ejemplos, más debe verse limitada por los mismos.

Ejemplo I

Formulaciones para cintas dentales blanqueadoras que incluyen los ingredientes

 26
65

enumerados en la siguiente Tabla I.

TABLA I					
Composiclón de la Cinta	A	B	C	D	E
Etanol	35,73	31,02	35,73	35,73	0
Acetato de etilo	0	0	0	0	37,7
Polivinilpirrolidona/acetato de vinilo	8,91	8,68	0	0	6,0
Polivinilpirrolidona	0	0	8,91	0	2,9
Hidroxiapatita	19,62	24,32	19,62	19,62	19,6
Colofonio	35,74	31,02	35,74	35,74	31,7
PEG 600	0	4,96	0	0	3,0
Polyox	0	0	0	7,0	0
Agua	0	0	0	1,91	0
Total (%)	100,00	100,00	100,00	100,00	100,00

Las composiciones de las cintas de la Tabla I pueden ser preparadas mediante la adición lenta del material adhesivo (por ejemplo, colofonio, polivinilpirrolidona, polivinilpirrolidona/acetato de vinilo, Polyox, PEG 600 o mezclas de los anteriores) al solvente (etanol, acetato de etilo) con agitación vigorosa, a los efectos de formar una solución viscosa y traslúcida. Se puede agregar polvo de hidroxiapatita a esta solución y luego mezclarla meticulosamente. La mezcla resultante de color blanco es vaciada sobre un papel kraft recubierto con polietileno y se le debe permitir secarse. Se obtiene una cinta de color blanco que puede ser desprendida con facilidad de la placa. La cinta seca tiene un espesor aproximado de entre aproximadamente 0,1 y

69 27 66

0,25 mm.

Ejemplo II

Se puede preparar una serie de composiciones blanqueadoras de aplicación directa que contengan los ingredientes enumerados en la siguiente Tabla III.

TABLA III						
Composiciones Líquidas de Aplicación Directa						
	F	G	H	I	J	K
BIO-PSA*	50	40	25	50	25	34,9
Acetato de etilo	33	48	48	20	45	40
Aceite Mineral	2	2	2	—	2	—
Acetina	—	—	—	10	—	—
Hidroxiapatita	5	10	25	20	25	25
Carbopol 974	—	—	—	—	3	0,1
* adhesivo sensible a la presión a base de polímero de silicona						

Las composiciones pueden ser aplicadas directamente a las superficies de los dientes a los fines de impartirles un aspecto blanco y natural. Se prefiere que la composición de aplicación directa permanezca sobre la superficie de los dientes durante un período de entre aproximadamente 3 y 8 horas antes de remover el recubrimiento.

28
67

REIVINDICACIONES:

1. Se reivindica una composición para el blanqueado rápido de los dientes que es utilizada para impartirle un aspecto blanco y natural al esmalte dental y que está conformada por un adhesivo y por un material particulado blanqueador que incluye hidroxiapatita.
2. Una composición de acuerdo con la Reivindicación 1, donde la composición contiene entre aproximadamente 0,1 y alrededor de 99% en peso del adhesivo y entre aproximadamente 0,5 y alrededor de 60% en peso de hidroxiapatita.
3. Una composición de acuerdo con la Reivindicación 1, donde el adhesivo incluye un polímero de poliorganosiloxano.
4. Una composición de acuerdo con la Reivindicación 1, donde el adhesivo incluye un adhesivo a base de siloxano que es sensible a la presión.
5. Una composición de acuerdo con la Reivindicación 1, donde el adhesivo incluye una resina de silicona.
6. Una composición de acuerdo con la Reivindicación 1, donde el adhesivo incluye un polímero que es seleccionado a partir del grupo conformado por las resinas naturales, las resinas naturales modificadas y los adhesivos que son sensibles a la presión.
7. Una composición de acuerdo con la Reivindicación 1, donde el adhesivo incluye un polímero que es seleccionado a partir del grupo conformado por polivinilpirrolidona, los copolímeros de polivinilpirrolidona/acetato de vinilo y polietilenglicol.
8. Una cinta dental que comprende una capa que incluye la composición de

71

28
68

acuerdo con la Reivindicación 1, donde dicha capa puede ser adherida a la superficie de un diente.

9. Una composición líquida para el blanqueado de los dientes que incluye la composición de acuerdo con la Reivindicación 1, donde dicha composición líquida para el blanqueado de los dientes se adhiere a la superficie de un diente.
10. Un método para blanquear la superficie de un diente, el cual comprende la aplicación de una composición de acuerdo con la Reivindicación 1, a la superficie de dicho diente.
11. Una composición para el blanqueado rápido de los dientes que es utilizada para impartirle un aspecto blanco y natural al esmalte dental y que está conformada por un adhesivo a base de siloxano que es sensible a la presión y por un material particulado blanqueador.
12. Una composición de acuerdo con la Reivindicación 11, donde el material particulado blanqueador está constituido por uno o más materiales que son seleccionados a partir del grupo conformado por fosfato de calcio, óxido de titanio, óxido de aluminio, óxido de estaño, óxido de calcio, óxido de magnesio, polietileno, polipropileno, un copolímero de etileno/propileno, politetrafluoroetileno, polihexafluoropropeno y las combinaciones de los anteriores.
13. Una composición de acuerdo con la Reivindicación 11, donde el material particulado blanqueador es seleccionado a partir del grupo conformado por: fosfato tetracálcico, fosfato de calcio amorfo, fosfato alfa-tricálcico, fosfato beta-tricálcico, hidroxiapatita y las mezclas de los anteriores.
14. Una composición de acuerdo con la Reivindicación 11, donde el adhesivo a

24 30 69

base de siloxano que es sensible a la presión incluye un copolímero de poliorganosiloxano y resina de silicona.

15. Una composición de acuerdo con la Reivindicación 9, donde el material particulado blanqueador tiene un diámetro promedio de entre al menos aproximadamente 0,5 micrones y alrededor de 500 micrones.
16. Un método para impartirle blancura a un diente de un mamífero, donde dicho método comprende la aplicación de una composición que está conformada por un adhesivo a base de siloxano que es sensible a la presión y por un material particulado blanqueador, a dicho diente.
17. Un método de acuerdo con la Reivindicación 16, donde la aplicación es llevada a cabo mediante la puesta en contacto de una película que contiene dicha composición para el blanqueado de los dientes, con la superficie de un diente.
18. Un método de acuerdo con la Reivindicación 16, donde la aplicación es llevada a cabo por medio de la puesta en contacto de una forma líquida de dicha composición para el blanqueado de los dientes, con la superficie del diente.
19. Un método de acuerdo con la Reivindicación 16, donde el material particulado blanqueador está constituido por uno o más materiales que son seleccionados a partir del grupo conformado por fosfato de calcio, óxido de titanio, óxido de aluminio, óxido de estaño, óxido de calcio, óxido de magnesio, polietileno, polipropileno, un copolímero de etileno/propileno, politetrafluoroetileno, polihexafluoropropeno y las combinaciones de los anteriores.
20. Un método de acuerdo con la Reivindicación 16, donde el material



particulado blanqueador es seleccionado a partir del grupo conformado por: fosfato tetracálcico, fosfato de calcio amorfo, fosfato alfa-tricálcico, fosfato beta-tricálcico, hidroxiapatita y las mezclas de los anteriores.

21. Un método de acuerdo con la Reivindicación 16, donde el adhesivo a base de siloxano que es sensible a la presión incluye un copolímero de poliorganosiloxano y resina de silicona.
22. Un método de acuerdo con la Reivindicación 16, donde el material particulado blanqueador tiene un diámetro promedio de entre al menos aproximadamente 0,5 micrones y alrededor de 500 micrones.

PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL SEARCHING AUTHORITY

To:
COLGATE PALMOLIVE COMPANY
Attn. BULLOCK, Kristyne, A.
909 River Road, P.O. Box 1343
Piscataway, New Jersey 08855-1343
UNITED STATES OF AMERICA

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year)	26/04/2005
Applicant's or agent's file reference	7345-00
FOR FURTHER ACTION	See paragraphs 1 and 4 below
International application No.	PCT/US2004/026421
International filing date (day/month/year)	13/08/2004
Applicant COLGATE-PALMOLIVE COMPANY	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 48):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within 18 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 18 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the PCT Applicant's Guide, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 851 epo nl
Fax: (+31-70) 340-3018

Authorized officer

Sandrine Polenzani

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the International search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the International application. It should however be emphasized that, since all parts of the International application (claims, description and drawings) may be amended during the International preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before International publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no International search report would be established (see *PCT Applicant's Guide*, Volume IA, paragraph 298).

What parts of the International application may be amended?

Under Article 19, only the claims may be amended.

During the International phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the International application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the International search report or 18 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for International publication (Rule 48.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 48.2).

Where a demand for International preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the International application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the International application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the International application is English, the letter must be in English; if the language of the International application is French, the letter must be in French.

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 7345-00	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, Item 5 below.	
International application No. PCT/US2004/026421	International filing date (day/month/year) 13/08/2004	(Earliest) Priority Date (day/month/year) 15/08/2003
Applicant COLGATE-PALMOLIVE COMPANY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 8 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box II).3. ☒ Unity of invention is lacking (see Box III).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. _____

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/026421

74

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 8.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-22 (partly)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-22 (partly)

A rapid tooth whitening composition comprising an adhesive and a whitening particulate comprising a calcium phosphate; a dental strip comprising said composition; a liquid tooth whitening composition comprising said composition; a method for whitening the surface of a tooth comprising applying said composition to a surface of a tooth.

2. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising titanium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

3. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising aluminium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

4. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising tin oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

5. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising calcium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

6. claims: 11-12,14-19,21-22 (partly)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising magnesium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

7. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polyethylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

8. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polypropylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

9. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising a copolymer of ethylene/propylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

10. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising PTFE; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

11. claims: 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polyhexafluoropropene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

INTERNATIONAL SEARCH REPORT

International Application No. 800 77

PCT/US2004/026421

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61K7/16

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 7 A61K

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, EMBASE, BIOSIS, CHEM ABS Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Derwent Publications Ltd., London, GB; AN 2002-671681 XP002305980 "Coating agent for whitening teeth" & KR 2002 021 446 A (LG CHEM INVESTMENT LTD /LG HOUSEHOLD & HEATHCARE LTD) 21 March 2002 (2002-03-21)	1-7, 9-11, 14-22
Y	abstract	8
Y	US 2003/068284 A1 (DIRKSING ROBERT STANLEY ET AL) 10 April 2003 (2003-04-10) paragraphs [0008], [0043], [0054]; claim 1 ----- -/--	8

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in 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 relating 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

"I" 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.

"A" document member of the same patent family

Date of the actual completion of the international search

25 November 2004

Date of mailing of the international search report

26. 04. 2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentean 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 051 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Nopper-Jaunky, A

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US2004/026421

28

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/059302 A (YISSUM RES DEV CO ; MAGDASSI SHLOMO (IL); STEINBERG DORON (IL); KAMYSH) 24 July 2003 (2003-07-24) page 15, paragraph 2; claims 1,3,4,11,12,22,30; example 2 -----	1,2,6
X	EP 0 342 746 A (UNILEVER PLC ; UNILEVER NV (NL)) 23 November 1989 (1989-11-23) examples 1,5 -----	1,2,7
X	EP 0 786 245 A (SANGI KK) 30 July 1997 (1997-07-30) example 2 -----	1,2,7
X	EP 0 710 475 A (LONDON HOSPITAL MED COLL) 8 May 1996 (1996-05-08) page 10, line 22 - line 27; example 8 -----	1,2,5
A	NIWA M ET AL: "POLISHING AND WHITENING PROPERTIES OF TOOTHPASTE CONTAINING HYDROXYAPATITE" JOURNAL OF MATERIALS SCIENCE. MATERIALS IN MEDICINE, CHAPMAN AND HALL, LONDON, GB, vol. 12, no. 3, March 2001 (2001-03), pages 277-281, XP001050900 ISSN: 0957-4530 the whole document -----	1-22

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/026421

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 2002021446	A	21-03-2002	NONE
US 2003068284	A1	10-04-2003	US 2002006387 A1 17-01-2002
			US 2002018754 A1 14-02-2002
			US 5891453 A 06-04-1999
			US 5879691 A 09-03-1999
			AT 247932 T 15-09-2003
			AU 763529 B2 24-07-2003
			AU 3743600 A 04-10-2000
			BR 0009075 A 18-12-2001
			CA 2367148 A1 21-09-2000
			CN 1343109 A 03-04-2002
			CZ 20013285 A3 13-02-2002
			DE 60004796 D1 02-10-2003
			DE 60004796 T2 17-06-2004
			EP 1161198 A1 12-12-2001
			ES 2200850 T3 16-03-2004
			HK 1043722 A1 13-08-2004
			HU 0200573 A2 29-06-2002
			JP 2002538887 T 19-11-2002
			MX PA01009344 A 21-06-2002
			NO 20014472 A 13-11-2001
			NZ 514139 A 28-09-2001
			PL 349808 A1 09-09-2002
			RU 2219895 C2 27-12-2003
			SK 13092001 A3 04-04-2002
			TR 200102685 T2 21-12-2001
			WO 0054699 A1 21-09-2000
			AT 264657 T 15-05-2004
			AU 7805398 A 21-12-1998
			CA 2293352 A1 10-12-1998
			CN 1259029 A 05-07-2000
			DE 29824970 U1 13-11-2003
			DE 69823364 D1 27-05-2004
			DE 69823364 T2 17-02-2005
			EP 1438928 A1 21-07-2004
			EP 1011516 A1 28-06-2000
			ES 2221173 T3 16-12-2004
			HU 0003176 A2 28-02-2001
			JP 2002503990 T 05-02-2002
			NO 995930 A 03-02-2000
			PL 337207 A1 14-08-2000
			PT 1011516 T 30-09-2004
			RU 2190982 C2 20-10-2002
			SK 167999 A3 11-07-2000
			WO 9855044 A1 10-12-1998
WO 03059302	A	24-07-2003	AU 2002364491 A1 30-07-2003
			WO 03059302 A1 24-07-2003
			US 2005058744 A1 17-03-2005
EP 0342746	A	23-11-1989	AU 597199 B2 24-05-1990
			AU 3480889 A 23-11-1989
			BR 8902337 A 09-01-1990
			DE 68901492 D1 17-06-1992
			EP 0342746 A1 23-11-1989
			ES 2041971 T3 01-12-1993
			HK 91893 A 10-09-1993

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/026421

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0342746	A	IN 168407 A1	30-03-1991
		JP 2022214 A	25-01-1990
		PH 26077 A	06-02-1992
		US 4988499 A	29-01-1991
EP 0786245	A 30-07-1997	JP 9202717 A	05-08-1997
		DE 69713175 D1	18-07-2002
		DE 69713175 T2	23-01-2003
		EP 0786245 A1	30-07-1997
		US 5833959 A	10-11-1998
EP 0710475	A 08-05-1996	DE 69524037 D1	03-01-2002
		DE 69524037 T2	11-04-2002
		DK 710475 T3	13-05-2002
		EP 0710475 A1	08-05-1996
		ES 2168340 T3	16-06-2002
		JP 8208417 A	13-08-1996
		US 5679710 A	21-10-1997

81

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)**

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/026421

International filing date (day/month/year)
13.08.2004

Priority date (day/month/year)
15.08.2003

International Patent Classification (IPC) or both national classification and IPC
A61K7/18

Applicant
COLGATE-PALMOLIVE COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:

 European Patent Office
D-80288 Munich
Tel. +49 89 2399 - 0 Tx: 523856 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Nopper-Jaunky, A

Telephone No. +49 89 2399-7708



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/026421

Box No. 1 Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

83

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 86.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 86.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 84.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. ☐ The International Searching Authority has not been able to consider the validity of the priority claim because a copy of the earlier application whose priority has been claimed was not available to the International Searching Authority at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

4. Additional observations, if necessary:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 11-22 (partly)

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
- ☐ the description, claims or drawings (indicate particular elements below) or said claims Nos. are so unclear that no meaningful opinion could be formed (specify):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the whole application or for said claims Nos. 11-22 (partly)
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- ☐ See separate sheet for further details

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-22 (partly)

Box No. V Reasoned statement under Rule 43bis 1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1,2,5,6,7,8,10
Inventive step (IS)	Yes: Claims	
	No: Claims	1-22
Industrial applicability (IA)	Yes: Claims	1-22
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/026421

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV.

Rule 13.1 PCT deals with the requirements of unity of invention and states the principle that an international application should relate to only one or, if there is more than one invention, the inclusion of those inventions in one international application is only permitted if all inventions are so linked as to form a single general inventive concept. Unity of invention exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding "special technical features". The expression "special technical features" is defined in Rule 13.2. PCT as meaning those technical features that define a contribution which each of the inventions, considered as a whole, makes over the prior art with respect to novelty and inventive step. However, the subject-matter of claims 1-22 of the present invention is not considered as meeting the requirements for unity of invention, and this Authority considers that there are 11 different inventions which are not so linked as to form a single general inventive concept:

1. Claims 1-22 (partly)

A rapid tooth whitening composition comprising an adhesive and a whitening particulate comprising a calcium phosphate; a dental strip comprising said composition; a liquid tooth whitening composition comprising said composition; a method for whitening the surface of a tooth comprising applying said composition to a surface of a tooth.

2. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising titanium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

3. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising aluminium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

4. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising tin oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

5. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising calcium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

6. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising magnesium oxide; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

7. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polyethylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

8. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polypropylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

9. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising a copolymer of ethylene/propylene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

10. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising PTFE; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

11. Claims 11-12,14-19,21-22 (partly)

A rapid tooth whitening composition comprising a siloxane pressure sensitive adhesive and a whitening particulate comprising polyhexafluoropropene; a method for imparting whiteness to a tooth in a mammal, said method comprising applying to the tooth said composition.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows: the common special technical feature linking together inventions 1. to 11. is a rapid tooth whitening composition comprising an adhesive and a whitening particulate and a method for whitening teeth using said composition. This common special technical feature would be the contribution over the prior art. However, US 4,032,627 (D1) already discloses a teeth-coating liquid which comprises polyvinyl-pyrrolidone (PVP), a solvent selected from the group consisting of EtOH, water or their mixture, tetrasodium pyrophosphate-H₂O₂ as a teeth-whitening agent, titanium dioxide, hydroxyapatite,

vitamin E acetate, and a pigment. Therefore, inventions 1. to 11. are not considered as unitary.

Re Item V.

1. The following documents are referred to in this communication:

D1 : DATABASE WPI Derwent Publications Ltd., London, GB; AN 2002-671681
XP002305980 "Coating agent for whitening teeth" &; KR 2002 021 446 A
(LG CHEM INVESTMENT LTD /LG HOUSEHOLD &; HEATHCARE LTD) 21
March 2002 (2002-03-21)
D2 : WO 03/058302 A (YISSUM RES DEV CO ; MAGDASSI SHLOMO (IL);
STEINBERG DORON (IL); KAMYSH) 24 July 2003 (2003-07-24)
D3 : EP 0 342 746 A (UNILEVER PLC ; UNILEVER NV (NL)) 23 November 1989
(1989-11-23)
D4 : EP 0 786 245 A (SANGI KK) 30 July 1997 (1997-07-30)
D5 : EP 0 710 475 A (LONDON HOSPITAL MED COLL) 8 May 1996 (1996-05-
08)

2. The present examination will be based on the first invention mentioned in point IV.

The present application does not meet the criteria of Article 33(1) PCT, because
the subject-matter of claims 1,2,5,6,7,9,10 is not new in the sense of Article 33(2)
PCT.

- 2.1. Document D1 discloses a teeth-coating liquid which comprises polyvinyl
pyrrolidone (PVP), a solvent selected from the group consisting of ethanol, water
or their mixture, tetrasodium pyrophosphate-H₂O₂ as a teeth-whitening agent,
titanium dioxide, hydroxyapatite, vitamin E acetate, and a pigment. D1 is thus
novelty-destroying for claims 1,7,9,10.
2.2 Document D2 (see claim 16; example 2) discloses a chewing-gum comprising
hydroxyapatite for removing and/or for preventing or reducing dental plaque
(biofilm). Therefore, D2 is novelty-destroying for claims 1,2,6.
2.3 Document D3 (see example 5) discloses a toothpaste comprising hydroxyapatite
and polyethyleneglycol 300. D3 is thus novelty-destroying for claims 1,2 and 7.
2.4 Similarly, document D4 discloses (see examples 2, 7) toothpastes comprising
hydroxyapatite and polyethylene glycol. D4 is thus novelty-destroying for claims
1,2 and 7.
2.5 Document D5 (see ex. 8D) discloses dental compositions which comprise a resin

base made of at least one brominated or iodinated acrylate or methacrylate monomer in admixture with a filler material. The filler material is preferably radio-opaque and comprises apatite, hydroxyapatite, a modified hydroxyapatite, wollastonite or a powdered crosslinked polymer. Therefore, D5 is novelty-destroying for claims 1,2,5.

3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-22 does not involve an inventive step within the meaning of Article 33(3) PCT.

The problem to be solved by the present application can be seen as providing a rapid temporary whitening system which can be easily and safely applied by the wearer and once applied on the teeth, be able to resist removal by mastication or solvating by foods and beverages for a period of at least 5 to 8 hours. According to the Applicant, this problem has been solved by applying to the surface of the teeth dental compositions comprising an adhesive and hydroxyapatite as a whitening particulate.

D1, which is considered as the closest prior art, already discloses a teeth-whitening liquid with a good coating effect and fast drying property, comprising polyvinyl pyrrolidone (PVP) and hydroxyapatite. As D1 is only available to the examiner in form of an abstract, it is not possible at this stage of the procedure to evaluate the pertinence of the whole content of D1 over the present application. It is not excluded that a further examination of both novelty and inventive step should be necessary in the light of the translation of this prior document since the content of D1 seems to be relevant for the examination of the claimed matter on file.

Re Item VI.

The reference US 4,408,300 mentioned on page 10 of the description relates in fact to a transmission bus data network and should be corrected.

Re Item VII.

In claims 2 and 15 the word "about" used in conjunction with the limits of given ranges sets no objective border to the invention for which a protection is sought. One person skilled in the art is aware of the extent of the allowed variations

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/US2004/026421

around these values, depending *inter alia* upon the precision of the measuring devices at the relevant date. However, even when taking such variations into account, it must be clear to the reader which values fall within the claimed scope and which not. (Art. 6 PCT).

The vague and imprecise statements in the description on page 3 and 4 of the description imply that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity of the claims (Article 6 PCT) when used to interpret them. Those statements should therefore be amended or removed in order to bring the description in line with the claims.

TRANSMITTAL LETTER TO THE UNITED STATES RECEIVING OFFICE

Date	13 August 2004
International Application	
Attorney Docket No.	IR 7345-00

I. Certification under 37 CFR 1.10 (If applicable)

EV 380778135 US
Express Mail mailing number

13 August 2004
Date of Deposit

I hereby certify that the application/correspondence attached hereto is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Assistant Commissioner for Patents, Washington, D.C. 20231.


Signature of person mailing correspondence

Carol Stanley
Typed or printed name of person mailing correspondence

II. ☒ New International Application

TITLE	RAPID TEMPORARY TOOTH WHITENING COMPOSITION
-------	---

Earliest priority date (Day/Month/Year)
15 August 2003

SCREENING DISCLOSURE INFORMATION: In order to assist in screening the accompanying international application for purposes of determining whether a license for foreign transmittal should and could be granted and for other purposes, the following information is supplied. (Note: check as many boxes as apply):

- A. ☐ The invention disclosed was not made in the United States.
- B. ☐ There is no prior U.S. application relating to this invention.
- C. ☒ The following prior U.S. application(s) contain subject matter which is related to the invention disclosed in the attached international application. (NOTE: priority to these applications may or may not be claimed on form PCT/RO/101 (Request) and this listing does not constitute a claim for priority).

application no.	USN 10/841,983	filed on	15 August 2003
application no.	USN TO BE ASSIGNED	filed on	10 August 2004

- D. ☐ The present international application ☐ is identical ☐ contains less subject matter than that found in the prior U.S. application(s) identified in paragraph C.
- E. ☐ The present international application ☐ contains additional subject matter not found in the prior U.S. application(s) identified in paragraph C. above. The additional subject matter is found on pages and ☐ DOES NOT ALTER ☐ MIGHT BE CONSIDERED TO ALTER the general nature of the invention in a manner which would require the U.S. application to have been made available for inspection by the appropriate defense agencies under 35 U.S.C. 181 and 37 CFR 5.1. See 37 CFR 5.15

III. ☐ A Response to an Invitation from the RO/US. The following document(s) is (are) enclosed:

- A. ☐ A Request for An Extension of Time to File a Response
- B. ☐ A Power of Attorney (General or Regular)
- C. ☐ Replacement pages:

pages		of the request (PCT/RO/101)	pages		of the figures
pages		of the description	pages		of the abstract
pages		of the claims			

- D. ☐ Submission of Priority Documents

Priority document		Priority document	
-------------------	--	-------------------	--

- E. ☐ Fees as specified on attached Fee Calculation sheet form PCT/RO/101 annex

IV. ☐ A Request for Rectification under PCT 91 ☐ A Petition ☐ A Sequence Listing Diskette

V. ☐ Other (please specify):

The person signing this form is the:	☐ Applicant	Ellen K. Park
	☒ Attorney/Agent (Reg. No.) 34,054	Typed name of signer
	☐ Common Representative	Signature

EV360778135US

PCT REQUEST

Original (for SUBMISSION)

0	For receiving Office use only	
0-1	International Application No.	
0-2	International Filing Date	
0-3	Name of receiving Office and "PCT International Application"	
0-4	Form - PCT/RO/101 PCT Request	
0-4-1	Prepared Using	PCT-SAFE [EASY mode] Version 3.50 (Build 0002.158)
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	United States Patent and Trademark Office (USPTO) (RO/US)
0-7	Applicant's or agent's file reference	7345-00
I	Title of invention	RAPID TEMPORARY TOOTH WHITENING COMPOSITION
II	Applicant	
II-1	This person is:	applicant only
II-2	Applicant for	all designated States except US
II-4	Name:	COLGATE-PALMOLIVE COMPANY
II-5	Address:	300 Park Avenue New York, New York 10022 United States of America
II-6	State of nationality	US
II-7	State of residence	US
II-8	Telephone No.	732-878-7157
II-9	Facsimile No.	732-878-7853
III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant and inventor
III-1-2	Applicant for	US only
III-1-4	Name (LAST, First)	IBRAHIM, Sayed
III-1-5	Address:	152 Kingsberry Drive Somerset, New Jersey 08873 United States of America
III-1-6	State of nationality	US
III-1-7	State of residence	US

PCT REQUEST

Original (for SUBMISSION)

III-2	Applicant and/or inventor	
III-2-1	This person is:	applicant and inventor
III-2-2	Applicant for	US only
III-2-4	Name (LAST, First)	CHOPRA, Suman, K.
III-2-5	Address:	505 Major Road Dayton, New Jersey 08810 United States of America
III-2-6	State of nationality	US
III-2-7	State of residence	US
III-3	Applicant and/or inventor	
III-3-1	This person is:	applicant and inventor
III-3-2	Applicant for	US only
III-3-4	Name (LAST, First)	PRENCIPE, Michael
III-3-5	Address:	39 Spruce Street West Windsor, New Jersey 08550 United States of America
III-3-6	State of nationality	US
III-3-7	State of residence	US
IV-1	Agent or common representative; or address for correspondence	
	The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	agent
IV-1-1	Name (LAST, First)	PARK, Ellen, K.
IV-1-2	Address:	COLGATE-PALMOLIVE COMPANY 909 River Road Piscataway, New Jersey 08855 United States of America
IV-1-3	Telephone No.	732-878-7157
IV-1-4	Facsimile No.	732-878-7853
IV-1-5	e-mail	ellen_park@colpal.com
IV-1-6	Agent's registration No.	34055
V	DESIGNATIONS	
V-1	The filing of this request constitutes under Rule 4.9(e), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.	

PCT REQUEST

Original (for SUBMISSION)

VI-1	Priority claim of earlier national application		
VI-1-1	Filing date	15 August 2003 (15.08.2003)	
VI-1-2	Number	10/641,963	
VI-1-3	Country	US	
VI-2	Priority claim of earlier national application		
VI-2-1	Filing date	10 August 2004 (10.08.2004)	
VI-2-2	Number		
VI-2-3	Country	US	
VI-3	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1, VI-2	
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)	
VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	1	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	1	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	

PCT REQUEST

Original (for SUBMISSION)

VIII-2-1	Declaration: Entitlement to apply for and be granted a patent Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)). In a case where the declaration under Rule 4.17(iv) is not appropriate: Name (LAST, First)	in relation to this international application COLGATE-PALMOLIVE COMPANY is entitled to apply for and be granted a patent by virtue of the following:
VIII-2-1(i) v)		an assignment from IBRAHIM, Sayed to COLGATE-PALMOLIVE COMPANY, dated 15 August 2003 (15.08.2003)
VIII-2-1(i) v)		an assignment from CHOPRA, Suman, K. to COLGATE-PALMOLIVE COMPANY, dated 15 August 2003 (15.08.2003)
VIII-2-1(i) v)		an assignment from PRENCIPE, Michael to COLGATE-PALMOLIVE COMPANY, dated 15 August 2003 (15.08.2003)
VIII-2-1(i) x)	This declaration is made for the purposes of:	all designations

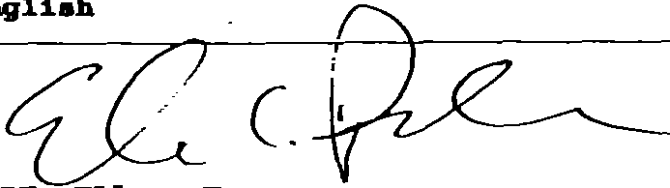
PCT REQUEST

Original (for SUBMISSION)

VIII-3-1	Declaration: Entitlement to claim priority Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(III) and 51bis.1(e)(III)) Name:	in relation to this international application COLGATE-PALMOLIVE COMPANY is entitled to claim priority of earlier application No. 10/641,963 by virtue of the following:
VIII-3-1(i) v)		an assignment from IBRAHIM, Sayed to COLGATE-PALMOLIVE COMPANY, dated 15 August 2003 (15.08.2003)
VIII-3-1(i) v)		an assignment from CHOPRA, Suman, K. to COLGATE-PALMOLIVE COMPANY, dated 15 August 2003 (15.08.2003)
VIII-3-1(i) v)		an assignment from PRENCIPE, Michael to COLGATE-PALMOLIVE COMPANY, dated 15 August 2003 (15.08.2003)
VIII-3-1(i) x)	This declaration is made for the purpose of:	all designations

PCT REQUEST

Original (for SUBMISSION)

IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	6	✓
IX-2	Description	23	-
IX-3	Claims	3	-
IX-4	Abstract	1	✓
IX-5	Drawings	0	-
IX-7	TOTAL	33	
	Accompanying items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	-
IX-17	PCT-BAFE physical media	-	✓
IX-19	Figure of the drawings which should accompany the abstract		
IX-20	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative		
X-1-1	Name (LAST, First)	PARK, Ellen, K.	
X-1-2	Name of signatory		
X-1-3	Capacity		

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
------	--	--

RAPID TEMPORARY TOOTH WHITENING COMPOSITION**INTRODUCTION**

[0001] The present invention relates to rapid tooth whitening systems. Embodiments of the present invention include tooth whitening compositions comprising whitening particulates and adhesive agents.

[0002] Many substances such as tea and coffee that a person confronts or comes in contact with on a daily basis can "stain" or reduce the "whiteness" of one's teeth. Consumers consider clean, white teeth to be aesthetically desirable. Dull looking, stained teeth are objectionable to most people both on the basis of cosmetic appearance and also socially as an indication of poor oral hygiene. One whose teeth are white may enjoy more personal confidence and satisfaction and may even enjoy greater social acceptance.

[0003] Dental gel compositions containing active oxygen liberating ingredients such as hydrogen peroxide, urea peroxide, percarbonates and perborates of alkali and alkaline earth metals have been disclosed in the prior art for whitening teeth. Such gel compositions although effective for whitening teeth require multiple applications of the gel over a period of one to two weeks to provide the desired whitening effect and in some instances requires a skilled professional to apply the gel. However, it is in many situations it is desirable to cosmetically improve the appearance of the teeth, that is whiten the teeth rapidly and temporarily as in immediate anticipation of an important public appearance or social event.

[0004] There is a continuing need for a rapid temporary tooth whitening system which can be safely applied by the wearer and without the need for specially trained dental personnel. The tooth whitening to be achieved should be easily applied to the teeth and once applied to the

teeth, be able to resist removal by mastication or solvating by foods and beverages for a period for at least 5 to 8 hours, but should be able to be easily removed by a wearer without harming the tooth. In this respect the prior art discloses tooth whitening coatings which can be applied to the teeth as a beauty aid providing immediate temporary whitening when applied to dental enamel in the same manner as one would apply a nail polish as for example as disclosed in US 4,021,915; 4,032,627; 4,482,535 and 6,210,163, however there is a need for improved temporary whitening compositions that are effective, durable, and impart a "natural" look to the users teeth.

SUMMARY

[0005] In one embodiment, the present invention provides a rapid tooth whitening composition for imparting a natural white appearance to dental enamel. The composition comprises an adhesive and a whitening particulate comprising hydroxyapatite.

[0006] In an embodiment of the present invention, a rapid tooth whitening composition for imparting a natural white appearance to dental enamel comprises a siloxane pressure sensitive adhesive and a whitening particulate.

[0007] In another embodiment, the present invention provides a method of imparting whiteness to a tooth in a mammal. The method comprises applying a composition to the tooth comprising a siloxane pressure sensitive adhesive and a whitening particulate.

[0008] It has been discovered that compositions and methods of this invention afford advantages over temporary whitening compositions among those known in the art including one or more of: enhanced whitening efficacy and aesthetics, improved adherence of the whitening composition to the tooth surface in the presence of saliva. Further uses, benefits and embodiments of the present invention are apparent from the description set forth herein.

DESCRIPTION

[0009] The following definitions and non-limiting guidelines must be considered in reviewing the description of this invention set forth herein. The headings (such as "Introduction" and "Summary,") and sub-headings (such as "Whitening Compositions" and "Methods", for example) used herein are intended only for general organization of topics within the disclosure of the invention, and are not intended to limit the disclosure of the invention or any aspect thereof. In particular, subject matter disclosed in the "Introduction" may include aspects of technology within the scope of the invention, and may not constitute a recitation of prior art. Subject matter disclosed in the "Summary" is not an exhaustive or complete disclosure of the entire scope of the invention or any embodiments thereof. Classification or discussion of a material within a section of this specification as having a particular utility (e.g., as being an "active" or a "carrier" ingredient) is made for convenience, and no inference should be drawn that the material must necessarily or solely function in accordance with its classification herein when it is used in any given composition.

[0010] The citation of references herein does not constitute an admission that those references are prior art or have any relevance to the patentability of the invention disclosed herein. Any discussion of the content of references cited in the Introduction is intended merely to provide a general summary of assertions made by the authors of the references, and does not constitute an admission as to the accuracy of the content of such references. All references cited in the Description section of this specification are hereby incorporated by reference in their entirety.

[0011] The description and specific examples, while indicating embodiments of the invention, are intended for purposes of illustration only and are not intended to limit the scope of the invention. Moreover, recitation of multiple embodiments having stated features is not

intended to exclude other embodiments having additional features, or other embodiments incorporating different combinations the stated of features. Specific Examples are provided for illustrative purposes of how to make and use the compositions and methods of this invention and, unless explicitly stated otherwise, are not intended to be a representation that given embodiments of this invention have, or have not, been made or tested.

[0012] As used herein, the words "preferred" and "preferably" refer to embodiments of the invention that afford certain benefits, under certain circumstances. However, other embodiments may also be preferred, under the same or other circumstances. Furthermore, the recitation of one or more preferred embodiments does not imply that other embodiments are not useful, and is not intended to exclude other embodiments from the scope of the invention.

[0013] As used herein, the word "include," and its variants, is intended to be non-limiting, such that recitation of items in a list is not to the exclusion of other like items that may also be useful in the materials, compositions, devices, and methods of this invention.

[0014] As referred to herein, all compositional percentages are by weight of the total composition, unless otherwise specified.

Tooth Whitening Compositions

[0015] In accordance with various embodiments of the present invention, a whitening composition is provided for imparting a natural white appearance to a tooth surface. The tooth surface is generally comprised of dental enamel, and the whitening composition contacts and preferably adheres to the dental enamel to impart an immediate discernable whitening effect, thus rapidly altering the color of the surface of the tooth. The present invention provides methods for whitening a tooth surface using compositions according to the

present invention. As referred to herein, "tooth" or "teeth" refers to natural teeth, dentures, dental plates, fillings, caps, crowns, bridges, dental implants, and the like, and any other hard surfaced dental prosthesis either permanently or temporarily fixed within the oral cavity. As used herein, "whitening" refers to a change in visual appearance of a tooth, preferably such that the tooth has a brighter shade. Increase in whiteness of a dental surface can be observed visually, for example with the aid of color comparison charts or gauges, or measured by colorimetry, using any suitable instrument such as a Minolta Chromameter, e.g., model CR-400 (Minolta Corp., Ramsey, NJ). The instrument can be programmed, for example, to measure Hunter Lab values or L*a*b* values according to the standard established by the International Committee of Illumination (CIE). The L*a*b* system provides a numerical representation of three-dimensional color space where L* represents a lightness axis, a* represents a red-green axis and b* represents a yellow-blue axis. The L* and b* axes are typically of greatest applicability to measurement of tooth whiteness. Increase in whiteness can be computed from differences in L*, a* and b* values before and after treatment, or between untreated and treated surfaces. A useful parameter is ΔE^* , calculated as the square root of the sum of the squares of differences in L*, a* and b* values, using the formula:

$$\Delta E^* = [(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]^{1/2}$$

A higher value of ΔE^* indicates greater increase in whiteness. In various embodiments, the method of the present invention can effect a ΔE^* of at least about 1, or at least about 3, or at least about 4, or at least about 5.

[0016] In one embodiment of the present invention, the whitening composition comprises an adhesive and a whitening particulate. The whitening composition can comprise additional ingredients, as recognized by one of skill in the art. The whitening composition can

be incorporated into a dental strip or film form, or into a liquid product which can be applied to the surface of a tooth by manual application. In another embodiment, methods of whitening a surface of a tooth are provided.

Adhesives

[0017] In various embodiments of the present invention, the whitening composition comprises an adhesive, which serves multiple functions, including enhancing adherence of the whitening composition to the surface of the tooth to be whitened. In such embodiments, the adhesive generally comprises one or more organic polymers or copolymers that are dispersed or dissolved in a volatile solvent.

[0018] A variety of organic polymers are useful as adhesives with the present invention. For example, one preferred class of adhesive polymers comprise siloxane polymers, which are also generally known in the art as "silicone" polymers. In certain embodiments of the present invention, the adhesive polymers in the composition are those in which a whitening particulate can be dispersed and are well known in the art. Many such silicone polymers are commercially available. In various embodiments, a preferred silicone-based adhesive polymer is a polyorganosiloxane. One such polyorganosiloxane is produced by condensing a silicone resin and an organosiloxane such as a polydiorganosiloxane. Such polymers are an elastomeric, tacky material, adhesion of which to dental enamel surfaces can be varied by altering the ratio of silicone resin to polydiorganosiloxane in the copolymer molecule. Preferably, the polymers are pressure sensitive polymers specifically designed for pharmaceutical use and are permeable to many drug compounds and find application for the transdermal application of various compounds. In one such embodiment, the silicone polymers are the copolymer product of mixing a silanol terminated polydiorganosiloxane such as polydimethyl siloxane with a silanol-

containing silicone resin whereby the silanol groups of the polydiorganosiloxane undergo a condensation reaction with the silanol groups of the silicone resin so that the polydiorganosiloxane is lightly crosslinked by the silicone resin (that is, the polydiorganosiloxane chains are bonded together through the resin molecules to give chain branching and entanglement and/or a small amount of network character) to form the silicone polymers. A catalyst, for example, an alkaline material, such as ammonia, ammonium hydroxide or ammonium carbonate, can be mixed with the silanol-terminated polydiorganosiloxane and the silicone resin to promote this crosslinking reaction. By copolymerizing the silicone resin with the silanol terminated polydiorganosiloxane, there results a polymer with self adhering properties and the cohesive properties of a soft elastomer matrix characteristic of pressure sensitive polymers being distinguished from the hard, non-elastomeric properties of other silicone resins. In one embodiment, adhesive polymers used in the whitening composition are available from the Dow-Corning Company under the brand name BIO-PSA.

[0019] The modification of a ratio of silicone resin to polydiorganosiloxane modifies the tackiness of the hydrophilic polymer. This ratio can be in the range of about 70:30 to about 50:50. For example, the BIO-PSA silicone sold by Dow-Corning is available in three silicone resin to silicone polymer ratios namely, 65/35 (low tack), 60/40 (medium tack), 55/45 (high tack). The rapid tooth whitening composition in some embodiments according to the invention contains an organic adhesive dispersed or dissolved in the volatile solvent. For example, a polyorganosiloxane pressure sensitive adhesive is available dissolved in either ethyl acetate solvent or dimethicone.

[0020] In other embodiments of the present invention, useful polymers for adhesives include those such as Carbomers, such as carboxymethylene polymers including

acrylic acid polymers and acrylic acid copolymers. Carboxypolymethylene is a slightly acidic vinyl polymer with active carboxyl groups. A carboxypolymethylene preferred for use in the practice of the present invention is a copolymer of acrylic acid cross linked with approximately 0.75% to approximately 1.5% polyallyl sucrose that is sold under the trade designation Carbopol 934, 974 by B.F. Goodrich. The adhesive is preferably a natural resin, particularly a resin selected from shellac resins, colophonium resins and modified colophonium resins. Another suitable group of adhesives is organic polymeric compositions represented by the group of alkyd resins, polyvinyl acetaldehydes, polyvinyl alcohols, polyvinyl acetates, poly(ethylene oxide), polyacrylates, ketone resins, polyvinylpyrrolidone, polyvinylpyrrolidone/vinyl acetate copolymer, polyethylene glycols of 200 to 1000 molecular weight and polyoxyethylene/polyoxopropylene block copolymers (Polyox), and silicone resins. As appreciated by one of skill in the art, the adhesive polymers may comprise copolymers or mixtures of polymers, including the adhesive polymers described herein.

[0021] In various embodiments, the adhesive polymer is present in the liquid whitening compositions of the present invention at a concentration of about 1 to about 80% by weight and preferably about 15 to about 40% by weight.

Volatile Carrier

[0022] Certain embodiments of the present invention comprise carriers, especially those whitening compositions that are in liquid solution. Some suitable carriers for use in the preparation of the whitening compositions of the present invention include volatile solvents such water, ethanol and ethyl acetate and non-volatile, water soluble solvents such as triacetin. Generally the solvent in which the whitening particle is dispersed is present in the composition

at a concentration of about 10 to about 80% by weight and preferably about 40 to about 70% by weight.

Whitening Particulates

[0023] In various embodiments, the whitening composition comprises a whitening particulate. As used herein, the term "whitening particulate" can encompass a plurality of whiteness-imparting particulates or particles within the whitening composition. It should be noted that the plurality of particulates may comprise one or more different species of whitening particulate materials that are independently selected from one another. The selection of multiple whitening particles may be useful for modifying the overall color shade of the whitening composition. In various embodiments, the whitening particulates can be any white colored or white pigmented particles such as, for example, white mineral particles, white metal oxide particles, or a white polymer particles. As used herein, "white" is considered a color, and a "white" color can be any color commonly perceived as white, for example colors set forth in the Vita Shade Guide scale of whiteness, or colors that are perceived as whiter than those displayed in the Vita Shade Guide.

[0024] In various embodiments of the present invention, the average diameter of such particles can be from about 0.5 μm (microns) to about 500 microns, from about 10 microns to about 100 microns, or from about 20 microns to about 50 microns.

[0025] In some embodiments, white mineral particles can comprise a non-toxic mineral or salt that can impart a white color. In various embodiments, the whitening particulates can comprise a calcium phosphate. In various configurations, the calcium phosphate can have a structure selected from tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate and hydroxyapatite ($\text{Ca}_5(\text{OH})(\text{PO}_4)_3$). The calcium

phosphate in various embodiments, can be a substantially aqueous insoluble calcium phosphate and non-crystalline, poorly crystalline or crystalline form such as, for example, crystalline hydroxyapatite.

[0026] Hydroxyapatite has a similar physical structure as tooth enamel, and thus has a strong affinity to the tooth enamel surfaces, resulting in the hydroxyapatite particulates imparting a "natural" white appearance to the enamel surface, where they are used. The preparation of hydroxyapatite is well known to the art as disclosed in U.S. 4,274,879; U.S. 4,330,514; U.S. 4,324,772; U.S. 4,408,300; U.S. 4,097,935; U.S. 4,207,300. The hydroxyapatite whitening agent is present in the whitening composition of the present invention at a concentration of about 0.5 to about 60% by weight and preferably about 15 to about 40% by weight.

[0027] Non-limiting examples of a hydroxyapatite include Hydroxyapatite A1 (Himed, Old Bethpage, NY). In some configurations, hydroxyapatite particles can comprise aggregates of smaller hydroxyapatite particles. In non-limiting example, such aggregates can have a mean diameter of from about 100 nm to about 1000 nm, and comprise hydroxyapatite particles having a mean diameter of from about 0.1 nm to about 10 nm.

[0028] The whitening particulates can be, in some embodiments, a metal oxide. The metal oxide can comprise any metal oxide that provides a white color, such as, for example, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, barium oxide, or a combination thereof.

[0029] The whitening particulates can be, in some embodiments, polymeric white-colored particles such as disclosed in US Patent 6,669,930 to Hoic. Polymeric white-colored particles can comprise, in non-limiting example, polyethylene (PE), polypropylene,

ethylene/propylene copolymer, polytetrafluoroethylene (PTFE) or polyhexafluoropropene. In a non-limiting example, the polymeric white-colored particles can be polyethylene PE220, polypropylene, or PTFE as supplied by PreSperac, Inc., Somerset NJ. In a non-limiting example, the polymeric whitening particulates can comprise a polymer having a weight average molecular weight, a number average molecular weight, a Z-average molecular weight or a viscosity average molecular weight ranging from about 100 to about 10,000,000; from about 200 to about 5,000,000; from about 500 to about 1,000,000; from about 1,000 to about 500,000; from about 10,000 to about 100,000, or from about 20,000 to about 50,000.

[0030] In some embodiments, the whitening particulates can comprise pearlescent particles. In some configurations, the pearlescent particles can provide a white pearlescent appearance to a composition herein. "Pearlescence" and "pearlescent," as used herein, refers to an optical property of a material in which the material can have a pearl-like, lustrous appearance. In some configurations, a pearlescent material can provide an appearance of depth. In some aspects, a pearlescent material can further provide an appearance of shine. Without being limited by theory, pearlescent particles are believed to partially reflect and partially refract incident light. The extent of partial refraction or reflection of incident light by a pearlescent material can depend on the angle of light incidence and/or the angle of viewing. Pearlescent particles used in the compositions described herein can provide aesthetic or cosmetic effects such as, for example, sparkle or luster.

[0031] Pearlescent particles can comprise a single mineral or chemical species, such as, for example a silicate such as mica, or bismuth oxychloride. By "mica" is meant any one of a group of hydrous aluminum silicate minerals with platy morphology and perfect basal (micaceous) cleavage. Mica can be, for example, sheet mica, scrap mica or flake mica, as

exemplified by muscovite, biotite or phlogopite type micas. In some embodiments, the pearlescent particles can comprise a complex comprising more than one mineral or chemical species, such as, for example, mica coated with a metal oxide such as titanium oxide. Pearlescent particles can also be of biological origin, for example fish scale or mother-of-pearl. Certain pearlescent particles of biological origin can comprise calcium carbonate, such as, for example, pearl, mollusk shell such as mother-of-pearl obtained from oyster shell, or nacre.

[0032] In some embodiments, white pearlescent particles can be, for example, those described as Timiron® pigments, Biron® powders, Biron® dispersions or Nailsyn® dispersions (all registered trademarks of EM Industries, Inc. Hawthorne, NY, division of E. Merck). For example, mica titanium particles can be pearlescent particles such as Timiron® particles. White pearlescent mica titanium particles can be, for example "Silverwhite" Timiron® particles such as Timiron® Starluster MP-115, Timiron® Supersheen MP-1001, Timiron® Sparkle MP-47, Timiron® Supersilk MP-1005, Timiron® Pearl Flake MP-10, Timiron® Pearl Sheen MP-30, Timiron® Super Silver Fine, Timiron® Gleamer Flake MP-111, Timiron® Ultraluster MP-45, Timiron® Transwhite MP-18, Timiron® Diamond Cluster MP-149, Timiron® Super Silver, Timiron® Stardust MP-80, Timiron® Arctic Silver or Timiron® Snowflake MP-99.

[0033] A tooth-coating fluid of the present invention can comprise whitening particulates from about 0.01% (w/w) up to about 50% (w/w), from about 0.1% (w/w) up to about 20% (w/w), from about 1% (w/w) up to about 19% (w/w), from about 2% (w/w) up to about 18% (w/w), from about 3% (w/w) up to about 17% (w/w), from about 4% (w/w) up to about 16% (w/w), or from about 6% (w/w) up to about 15% (w/w). In some configurations, the whitening particulates (including pearlescent particles) can have an average size of from about 0.01 micron to about 500 microns, from about 0.5 micron to about 100 microns, or from about 2

microns to about 20 microns in diameter or longest dimension. Such particles as referenced herein are intended to include primary particles as well as aggregates of particles.

[0034] The plurality of whitening particulates can be independently comprised of a material selected from the group consisting of calcium phosphate compounds, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, ethylene/propylene copolymer, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof. In one embodiment, the plurality of whitening particulates can comprise a calcium phosphate, such as a hydroxyapatite, in particular a crystalline hydroxyapatite.

Additional Ingredients

[0035] In some embodiments, a sweetening material is employed in the tooth whitening composition of the present invention. Suitable sweetening agents include sodium saccharin, sodium cyclamate, xylitol, aspartame and the like, in concentrations of about 0.01 to about 1% by weight and preferably about 0.05 to about 0.75% by weight. Sodium saccharin is preferred for certain embodiments.

[0036] The tooth whitening compositions of the present invention optionally comprise a flavoring agent in various embodiments. Flavoring agents that are used in such embodiments include essential oils as well as various flavoring aldehydes, esters, alcohols, and similar materials. Examples of the essential oils include oils of spearmint, peppermint, wintergreen, sassafras, clove, sage, eucalyptus, marjoram, cinnamon, lemon, lime, grapefruit, and orange. Also useful are such chemicals as menthol, carvone, and anethole. Of these, the most commonly employed are the oils of peppermint, spearmint and wintergreen. The flavoring agent is incorporated in the whitening liquid composition of the present invention at a

concentration of about 0.1 to about 2% by weight and preferably about 0.1 to about 0.5% by weight.

[0037] The compositions of the present invention optionally comprise an antimicrobial (e.g., antibacterial) agent. Any orally acceptable antimicrobial agent can be used, including Triclosan (5-chloro-2-(2,4-dichlorophenoxy)phenol); 8-hydroxyquinoline and salts thereof; zinc and stannous ion sources such as zinc citrate, zinc sulphate, zinc glycinate, sodium zinc citrate and stannous pyrophosphate; copper (II) compounds such as copper (II) chloride, fluoride, sulfate and hydroxide; phthalic acid and salts thereof such as magnesium monopotassium phthalate; sanguinarine; quaternary ammonium compounds, such as alkylpyridinium chlorides (e.g., cetylpyridinium chloride (CPC), combinations of CPC with zinc and/or enzymes, tetradecylpyridinium chloride, and N-tetradecyl-4-ethylpyridinium chloride,); bisguanides, such as chlorhexidine digluconate, hexetidine, octenidine, alexidine; halogenated bisphenolic compounds, such as 2,2' methylenebis-(4-chloro-6-bromophenol); benzalkonium chloride; salicylanilide, domiphen bromide; iodine; sulfonamides; bisbiguanides; phenolics; piperidino derivatives such as delmopinol and octapinol; magnolia extract; grapeseed extract; thymol; eugenol; menthol; geraniol; carvacrol; citral; eucalyptol; catechol; 4-allylcatechol; hexyl resorcinol; methyl salicylate; antibiotics such as augmentin, amoxicillin, tetracycline, doxycycline, minocycline, metronidazole, neomycin, kanamycin and clindamycin; and mixtures thereof. A further illustrative list of useful antibacterial agents is provided in U.S. Patent 5,776,435, Gaffar, et al., issued July, 7, 1998.

[0038] The compositions of the present invention optionally comprise an antioxidant. Any orally acceptable antioxidant can be used, including butylated hydroxyanisole

(BHA), butylated hydroxytoluene (BHT), vitamin A, carotenoids, vitamin E, flavonoids, polyphenols, ascorbic acid, herbal antioxidants, chlorophyll, melatonin, and mixtures thereof.

[0039] The compositions of the present invention optionally comprise a saliva stimulating agent, useful for example in amelioration of dry mouth. Any orally acceptable saliva stimulating agent can be used, including without limitation food acids such as citric, lactic, malic, succinic, ascorbic, adipic, fumaric, and tartaric acids, and mixtures thereof. One or more saliva stimulating agents are optionally present in a saliva stimulating effective total amount.

[0040] The compositions of the present invention optionally comprise a breath freshening agent. Any orally acceptable breath freshening agent can be used, including without limitation zinc salts such as zinc gluconate, zinc citrate and zinc chlorite, α -ionone and mixtures thereof. One or more breath freshening agents are optionally present in a breath freshening effective total amount.

[0041] The compositions of the present invention optionally comprise an antiplaque (e.g., plaque disrupting) agent. Any orally acceptable antiplaque agent can be used, including without limitation stannous, copper, magnesium and strontium salts, dimethicone copolyols such as cetyl dimethicone copolyol, papain, glucoamylase, glucose oxidase, urea, calcium lactate, calcium glycerophosphate, strontium polyacrylates and mixtures thereof.

[0042] The compositions of the present invention optionally comprise an anti-inflammatory agent. Any orally acceptable anti-inflammatory agent can be used, including steroidal agents such as flucinolone and hydrocortisone, and nonsteroidal agents (NSAIDs) such as ketorolac, flurbiprofen, ibuprofen, naproxen, indomethacin, diclofenac, etodolac, indomethacin, sulindac, tolmetin, ketoprofen, fenoprofen, piroxicam, nabumetone, aspirin,

diflunisal, meclofenamate, mefenamic acid, oxyphenbutazone, phenylbutazone, and mixtures thereof.

[0043] The compositions of the present invention optionally comprise an H₂ antagonist. H₂ antagonists useful herein include cimetidine, etintidine, ranitidine, ICIA-5165, tiotidine, ORF-17578, lupitidine, donetidine, famotidine, roxatidine, pifatidine, lamtidine, BL-6548, BMY-25271, zaltidine, nizatidine, mifentidine, BMY-52368, SKF-94482, BL-6341A, ICI-162846, ramixotidine, Wy-45727, SR-58042, BMY-25405, loxtidine, DA-4634, biefentidine, sufotidine, ebrotidine, HE-30-256, D-16637, FRG-8813, FRG-8701, impromidine, L-643728, HB-408.4, and mixtures thereof.

[0044] The compositions of the present invention optionally comprise a desensitizing agent. Desensitizing agents useful herein include potassium citrate, potassium chloride, potassium tartrate, potassium bicarbonate, potassium oxalate, potassium nitrate, strontium salts, and mixtures thereof. Alternatively or in addition a local or systemic analgesic such as aspirin, codeine, acetaminophen, sodium salicylate or triethanolamine salicylate can be used.

[0045] The compositions of the present invention optionally comprise a nutrient. Suitable nutrients include vitamins, minerals, amino acids, and mixtures thereof. Vitamins include Vitamins C and D, thiamine, riboflavin, calcium pantothenate, niacin, folic acid, nicotinamide, pyridoxine, cyanocobalamin, para-aminobenzoic acid, bioflavonoids, and mixtures thereof. Nutritional supplements include amino acids (such as L-tryptophane, L-lysine, methionine, threonine, levocarnitine and L-carnitine), lipotropics (such as choline, inositol, betaine, and linoleic acid), fish oil (including components thereof such as omega-3 (N-3)

polyunsaturated fatty acids, eicosapentaenoic acid and docosahexaenoic acid), coenzyme Q10, and mixtures thereof.

[0046] The compositions of the present invention optionally comprise biomolecules, such as bacteriocins, antibodies, and proteins. Suitable proteins include milk proteins and enzymes such as peroxide-producing enzymes, amylase, plaque-disrupting agents such as papain, glucoamylase, glucose oxidase, and "next generation" enzymes.

[0047] The compositions of the present invention optionally comprise additional ingredients, such as, plaque buffers such as urea, calcium lactate, calcium glycerophosphate and strontium polyacrylates; plant extracts; opacifying agents, and additional pigments and/or coloring agents.

[0048] The whitening composition of the present invention may be applied to tooth enamel by any suitable means, such as for example, in extruded form as a strip or as a liquid such as a paint-on liquid.

Strip

[0049] The whitening composition of the present invention may be in the form of a layer of a strip prepared using a conventional solvent casting process. Strips among those useful herein comprise polymers, natural and synthetic woven materials, non-woven material, foil, paper, rubber and combinations thereof. Preferably the strip of material is substantially water insoluble. Suitable polymers include polyethylene, ethylvinylacetate, polyesters, ethylvinyl alcohol, fluoroplastics, and combinations thereof. In various embodiments, the strip of material is generally less than about 1 mm (millimeter) thick, optionally less than about 0.05 mm thick, optionally about 0.001 to about 0.03 mm thick. The shape of the strip is any shape

and size that covers the desired oral surface. In one embodiment, the length of the strip material is from about 2 cm (centimeter) to about 12 cm, in another embodiment from about 4 cm to about 9 cm. The width of the strip material will also depend on the oral surface area to be covered. The width of the strip is generally from about 0.5 cm to about 4 cm, in one embodiment from about 1 cm to about 2 cm. The strip material may comprise shallow pockets, optionally filled by a composition of this invention. Strips among those useful herein are disclosed in U.S. Patent 6,514,484, Rajaiah et al. issued February 4, 2003.

[0050] For example, in some embodiments, a strip is prepared by solvent casting, an adhesive polymer or resin such as colophonium and/or polyvinylpyrrolidone is dissolved in a sufficient amount of a compatible solvent such as ethanol. After a solution has been formed, the addition of whitening particulates in powder form (e.g., hydroxyapatite) follows and any other ingredients such as sweeteners or flavors. The solution is coated onto a suitable casting carrier material from which the formed strip can be easily released from without damage. The carrier material must have a surface tension which allows the solution to spread evenly across the intended carrier width without soaking in to form a destructive bond between the two substrates. Examples of suitable carrier materials include glass, stainless steel, teflon, polyethylene impregnated kraft paper. The strip may be dried to a solid usable form in a high temperature air bath using a drying oven, drying tunnel, vacuum drier, or any other suitable drying equipment at a temperature. Thereafter the strip formed on the carrier is peeled off the carrier surface and cut into pieces of suitable size and shape for consumer use and packed into a suitable container.

[0051] To use the whitening strip for the present invention, the strip when applied to the teeth surface will adhere to the teeth in an appropriate manner and within 1 to 60 minutes, the teeth surfaces will whiten to a natural appearance as the whitening particulates present in the

strip matrix migrate to the tooth surfaces. In this regard, the whitening strip is formed to have a width dimension suitable to cover one or more teeth in a row (upper or lower). Therefore, the whitening strip may be applied to one or more of the upper set of teeth, or to one or more of the lower set of teeth either separately or simultaneously. The length dimension of the whitening strip is determined by the amount of coverage desired. In this regard, the number of teeth which it is desired to whiten will determine the dimensions for the whitening strip. For instance, it may be desired to only whiten the front teeth, which are most easily seen by others. Accordingly, the length of whitening strip can be reduced in this case, as compared to the case where it is desired to whiten all of the teeth. The duration of application of whitening strip to the teeth will depend upon the type and concentration of the whitening particulate, as well as the type and intensity of stain. The applied layer of whitening particulate will resist solvation removal by beverages or mastication for at least 2 to 8 hours and generally 3 to 5 hours. After the teeth are whitened to the satisfaction of the user, the portions of the strip can be easily removed by rinsing the mouth with water and brushing.

Paint-On Tooth Whitener

[0052] In one preferred embodiment, the whitening composition is applied using a "paint-on" technique. A small application device, such as a brush or spatula is coated with a composition of this invention and the composition is then placed on a tooth surface. Preferably, the composition is spread evenly on such surfaces, in sufficient quantity to deliver whitening particulates to the stained surfaces.

[0053] The paint-on whitening composition of the present invention is prepared in the form of a flowable viscous liquid suspension containing the whitening particulate and is

applied as such to the subject's teeth, by manual application, such as by painting the teeth with a soft applicator brush in the same manner as application of nail polish to a finger nail and without the intervention of a dentist or technological operations. Application by the user and evaporation or dissolution of the solvent leaves an adherent natural appearing white coating on the teeth which provides almost instantaneous whitening of the tooth enamel.

[0054] In various embodiments, the layer of tooth whitening composition applied to tooth enamel contains no ingredients imparting thereto an unacceptable taste or texture, rendering it unpleasant to the user while adhering strongly to tooth enamel. The composition is sufficiently adherent to tooth enamel to remain on the teeth for the applied whitening composition enabling the applied coating to resist the forces commonly applied by the lips and tongue as well as those forces encountered during normal mastication, as upon the evaporation or dissolution of the solvent in mouth after application a hard coating of whitening particulate forms in about 1 minute which coating is bonded securely to the tooth enamel to which it is applied. While the layer of applied paint-on whitening composition is in place, the user is to refrain from mastication. The whitening composition can be removed as and when required, at will, by an employment of standard oral hygiene procedures such as brushing or by rinsing with an alcoholic mouthwash.

Methods

[0055] A method of imparting whiteness to a tooth in a mammal is provided in one embodiment of the present invention, where the method comprises applying a composition to the tooth. The composition comprises a siloxane pressure sensitive adhesive and a whitening particulate, such as those previously described. In certain embodiments, the siloxane pressure sensitive adhesive comprises a copolymer of polyorganosiloxane and silicone resin. Preferred

whitening particulates are one or more materials selected from the group consisting of calcium phosphate, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, a copolymer of ethylene/propylene, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof. Other preferred whitening particulates are selected from the group consisting of: tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate, hydroxyapatite and mixtures thereof. The whitening particulate preferably has an average diameter of from at least about 0.5 microns up to about 500 microns.

[0056] In an embodiment, the applying is achieved by contacting a film comprising the tooth whitening composition with a surface of a the tooth. In an alternate embodiment, the applying is achieved by contacting a liquid form of the tooth whitening composition with a surface of the tooth.

[0057] The whitening composition of the present invention is prepared by adding the ingredients of the composition in a suitable vessel such as a stainless steel tank provided with a mixer in one embodiment. In the preparation for the whitening composition, the ingredients are advantageously added to the mixer in the following order: solvent, adhesive materials, hydroxyapatite and any desired flavoring or sweetener. The ingredients are then mixed to form a homogeneous dispersion. When mixed and ready for extrusion or application directly as a paint-on whitener, the composition is a white colored opaque viscous liquid composition.

[0058] The present invention is illustrated by the following examples but is not to be limited thereby.

Example I

[0059] Formulations for whitening dental strips having the ingredients listed in Table I below.

TABLE I					
Strip Composition	A	B	C	D	E
Ethanol	35.73	31.02	35.73	35.73	0
Ethylacetate	0	0	0	0	37.7
Polyvinylpyrrolidone/ vinyl acetate	8.91	8.68	0	0	6.0
Polyvinylpyrrolidone	0	0	8.91	0	2.9
Hydroxyapatite	19.62	24.32	19.62	19.62	19.6
Colophonium	35.74	31.02	35.74	35.74	31.7
PEG 600	0	4.96	0	0	3.0
Polyox	0	0	0	7.0	0
Water	0	0	0	1.91	0
Total (%)	100.00	100.00	100.00	100.00	100.00

[0060] The strip compositions of Table I can be prepared by slowly adding the adhesive material (such as colophonium, polyvinyl pyrrolidone, polyvinyl pyrrolidone/vinyl acetate, Polyox, PEG 600 or mixtures thereof) into the solvent (ethanol, ethyl acetate) with vigorous stirring to form a translucent and viscous solution. Hydroxyapatite powder can be added to this solution and then thoroughly mixed. The resulting white mixture is cast onto a polyethylene coated kraft paper and should be allowed to dry. A white colored strip is formed which can be readily peeled off from the plate. The dry strip has an approximate thickness of about 0.1 to 0.25 mm.

Example II

[0061] A series of paint-on whitening compositions can be prepared to contain the ingredients listed in Table III below.

TABLE III						
Liquid Paint-On Compositions						
	F	G	H	I	J	K
BIO-PSA*	50	40	25	50	25	34.9
Ethylacetate	33	48	48	20	45	40
Mineral Oil	2	2	2	—	2	—
Acetin	—	—	—	10	—	—
Hydroxyapatite	5	10	25	20	25	25
Carbopol 974	—	—	—	—	3	0.1
*silicone polymer based pressure sensitive adhesive						

[0062] The compositions can be painted on tooth surfaces to impart a natural white appearance to the teeth. It is preferred that the paint-on composition remains on the tooth surface for about 3 to 8 hours before removing the coating.

CLAIMS

What is claimed is:

1. A rapid tooth whitening composition for imparting a natural white appearance to dental enamel comprising an adhesive and a whitening particulate comprising hydroxyapatite.
2. A composition according to Claim 1, wherein the composition contains from about 0.1 to about 99% by weight of the adhesive, and from about 0.5 to about 60% by weight of hydroxyapatite.
3. A composition according to Claim 1, wherein said adhesive comprises a polyorganosiloxane polymer.
4. A composition according to Claim 1, wherein said adhesive comprises a siloxane pressure sensitive adhesive.
5. A composition according to Claim 1, wherein said adhesive comprises a silicone resin.
6. A composition according to Claim 1, wherein said adhesive comprises a polymer selected from the group consisting of natural resins, modified natural resins and pressure sensitive adhesives.
7. A composition according to Claim 1, wherein said adhesive comprises a polymer selected from the group consisting of polyvinylpyrrolidone, polyvinylpyrrolidone/vinyl acetate copolymers and polyethylene glycol.
8. A dental strip comprising a layer comprising the composition according to Claim 1, wherein said layer is operable to adhere to a surface of a tooth.

9. A liquid tooth whitening composition comprising the composition according to Claim 1, wherein the liquid tooth whitening composition adheres to a surface of a tooth.

10. A method for whitening the surface of a tooth comprising applying a composition according to Claim 1 to a surface of the tooth.

11. A rapid tooth whitening composition for imparting a natural white appearance to dental enamel comprising a siloxane pressure sensitive adhesive and a whitening particulate.

12. A composition according to Claim 11, wherein said whitening particulate is comprised of one or more materials selected from the group consisting of calcium phosphate, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, a copolymer of ethylene/propylene, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof.

13. A composition according to Claim 11, wherein said whitening particulate is selected from the group consisting of: tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate, hydroxyapatite and mixtures thereof.

14. A composition according to Claim 11, wherein said siloxane pressure sensitive adhesive comprises a copolymer of polyorganosiloxane and silicone resin.

15. A composition according to Claim 9, wherein said whitening particulate has an average diameter of from at least about 0.5 microns up to about 500 microns.

16. A method of imparting whiteness to a tooth in a mammal, the method comprising applying to the tooth a composition comprising a siloxane pressure sensitive adhesive and a whitening particulate.

17. A method according to Claim 16, wherein said applying is achieved by contacting a film comprising said tooth whitening composition with a surface of a the tooth.

18. A method according to Claim 16, wherein said applying is achieved by contacting a liquid form of said tooth whitening composition with a surface of the tooth.

19. A method according to Claim 16, wherein said whitening particulate is comprised of one or more materials selected from the group consisting of calcium phosphate, titanium oxide, aluminum oxide, tin oxide, calcium oxide, magnesium oxide, polyethylene, polypropylene, a copolymer of ethylene/propylene, polytetrafluoroethylene, polyhexafluoropropene and combinations thereof.

20. A method according to Claim 16, wherein said whitening particulate is selected from the group consisting of: tetracalcium phosphate, amorphous calcium phosphate, alpha-tricalcium phosphate, beta-tricalcium phosphate, hydroxyapatite and mixtures thereof.

21. A method according to Claim 16, wherein said siloxane pressure sensitive adhesive comprises a copolymer of polyorganosiloxane and silicone resin.

22. A method according to Claim 16, wherein said whitening particulate has an average diameter of from at least about 0.5 microns up to about 500 microns.

ABSTRACT

A composition for the rapid, temporary whitening of teeth comprising an adhesive material and whitening particulates.

PCT

126
126

GENERAL POWER OF ATTORNEY

(for several international applications filed under the Patent Cooperation Treaty)

(PCT Rule 90.5)

The undersigned person(s):

(Family name followed by given name; for a full legal entity, full official designation. The address must include postal code and name of country.)

COLGATE-PALMOLIVE COMPANY

300 Park Avenue

New York, New York 10022

United States of America

hereby appoint(s) the following person as:

☒ agent

☐ common representative

Name and address

(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

Bernard Lieberman, Rosemary M. Miano, Ellen K. Park and Clifford E. Wilkna, Jr. of

COLGATE-PALMOLIVE COMPANY

808 River Road

P.O. Box 1343

Piscataway, New Jersey 08855-1343

United States of America

to represent the undersigned before

☒ all the competent International Authorities

☐ the International Searching Authority only

☐ the International Preliminary Examining Authority only

in connection with any and all international applications filed by the undersigned with the following Office

RO/US

as receiving Office

and to make or receive payments on behalf of the undersigned.

Signature(s) (where there are several persons, each of them must sign; next to each signature, indicate the name of the person signing and the capacity in which the person signs, if such capacity is not obvious from reading this power):

COLGATE-PALMOLIVE COMPANY

By

Andrew D. Hendry

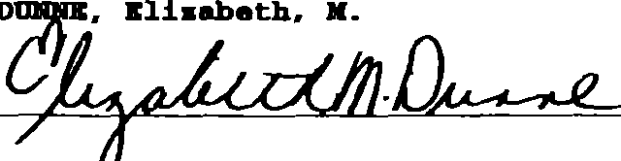
Senior Vice President, General Counsel and Secretary

Date: April 8, 2004

PCT (ANNEX - FEE CALCULATION SHEET)

Original (for SUBMISSION)

(This sheet is not part of and does not count as a sheet of the international application)

0	For receiving Office use only		
0-1	International Application No.		
0-2	Date stamp of the receiving Office		
0-4	Form PCT/RO/101 (Annex) PCT Fee Calculation Sheet Prepared Using	PCT-SAFE [EASY mode] Version 3.50 (Build 0002.158)	
0-8	Applicant's or agent's file reference	7345-00	
2	Applicant	COLGATE-PALMOLIVE COMPANY	
12	Calculation of prescribed fees	fee amount/multiplier	Total amounts (USD)
12-1	Transmittal fee T	⇒	300
12-2-1	Search fee S	⇒	1818
12-2-2	International search to be carried out by	EP	
12-3	International filing fee (first 30 sheets) H	1035	
12-4	Remaining sheets	3	
12-5	Additional amount (Q)	11	
12-6	Total additional amount Q	33	
12-7	H + Q = I	1068	
12-12	EASY Filing reduction R	-74	
12-13	Total international filing fee (I-R)	⇒	994
12-14	Fee for priority document		
	Number of priority documents requested	2	
12-15	Fee per document (Q)	20	
12-16	Total priority document fee: P	⇒	40
12-17	TOTAL FEES PAYABLE (T+S+H+P)	⇒	3152
12-19	Mode of payment	authorization to charge deposit account	
12-20	Deposit account instructions		
	The receiving Office	United States Patent and Trademark Office (USPTO) (RO/US)	
12-20-1	Authorization to charge the total fees indicated above.	✓	
12-20-2	Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.	✓	
12-20-3	Authorization to charge the fee for priority document.	✓	
12-21	Deposit account No.	03-2457	
12-22	Date	12 August 2004 (12.08.2004)	
12-23	Name and signature	DUNNE, Elizabeth, M. 	

131 128

EN SOLICITUD DE PATENTE ACTA N° P 04 01 02919, SE
ACOMPANIAN DOCUMENTO DE PRIORIDAD ESTADOUNIDENSE,
CON SU TRADUCCIÓN AL ESPAÑOL Y DOCUMENTO DE CESION DE
DERECHOS, CON SU TRADUCCIÓN AL ESPAÑOL.

BUENOS AIRES, NOVIEMBRE DE 2004.

Señor Comisario de Patentes del Instituto Nacional de la Propiedad Industrial:

COLGATE-PALMOLIVE COMPANY, Una Corporación del
Estado de Delaware, representada por su apoderado, **OBLIGADO & CIA.**
LDA. S.A., según personería acreditada bajo el N° 34.548, constituyendo
domicilio legal en Paraguay 610, Piso 17, Ciudad de Buenos Aires, en la
solicitud de patente Acta N° P 04 01 02919, al Señor Comisario de Patentes
decimos que:

De acuerdo a la prioridad reivindicada en la solicitud de estas
actuaciones, venimos por el presente a acompañar CD emitido por la Oficina
de Patentes de los Estados Unidos de América con la copia certificada en
formato electrónico del depósito efectuado en **Estados Unidos de América,**
bajo el N° 10/641,963 con fecha 15 de Agosto de 2003, con su
correspondiente traducción al español.

Asimismo, venimos a acompañar documento de cesión de derechos, a
fin de justificar la titularidad de la mandante, con su correspondiente
traducción al español.

Por lo expuesto, solicitamos al Señor Comisario de Patentes se sirva
proveer de conformidad, ya que:

P-20369-DdC

SERA JUSTICIA

132
129

LOS ESTADOS UNIDOS DE AMÉRICA

A TODOS AQUELLOS A QUIENES LA PRESENTE VINIERE:

DEPARTAMENTO DE COMERCIO DE LOS ESTADOS UNIDOS

OFICINA DE PATENTES Y MARCAS DE LOS ESTADOS UNIDOS

13 DE AGOSTO DE 2004

POR LA PRESENTE SE CERTIFICA QUE LO QUE OBRA ANEXO A ÉSTA ES COPIA FIEL DE LOS REGISTROS EN LA OFICINA DE PATENTES Y MARCAS DE LOS ESTADOS UNIDOS DE AQUELLOS ESCRITOS DE LA SOLICITUD DE PATENTE MÁS ADELANTE IDENTIFICADA QUE REUNIÓ LOS REQUISITOS PARA QUE SE LE CONCEDIERA UNA FECHA DE PRESENTACIÓN SOBRE LA BASE DE 35 USC 111.

NÚMERO DE SOLICITUD : 10/641,963

FECHA DE PRESENTACIÓN: 15 DE AGOSTO DE 2003

CERTIFICADO POR

**[Firma]
Jon W Dudas**

**Subsecretario de Comercio actuante para la Propiedad
Intelectual y como Director de la Oficina de Patentes y
Marcas de los Estados Unidos de América**

(HAY UN SELLO-OBLEA)

20369-DP

**COMPOSICIÓN BLANQUEADORA DENTAL TEMPORARIA
RÁPIDA**

ANTECEDENTES DE LA INVENCION

1. Campo de la Invención

La presente invención se dirige a una composición para alterar cosméticamente la apariencia de los dientes y mas particularmente a una composición que provee acción blanqueadora dental cosmética temporaria rápida.

2. Arte Previo

Muchas de las sustancias con las cuales una persona se enfrenta o está en contacto diariamente, por ejemplo té o café, pueden "teñir" o disminuir la "blancura" de los dientes. Los consumidores consideran que los dientes limpios y blancos son estéticamente deseables. Los dientes de aspecto opaco y manchados generan rechazo en la mayoría de las personas tanto en base al aspecto cosmético como al social, como indicación de mala higiene oral. La persona con dientes blancos goza de mayor confianza y satisfacción personal, e incluso de mayor aceptación social.

En el arte previo se han descrito composiciones dentales en gel contienen ingredientes liberadores de oxígeno activo, tales como peróxido de hidrógeno, peróxido de urea, percarbonatos y perboratos de metales alcalinos y alcalinotérreos para blanquear los dientes. Si bien son efectivos blanqueadores dentales, estas composiciones en gel requieren múltiples aplicaciones del gel durante un periodo de una a dos semanas, para

174

proporcionar el efecto blanqueador buscado, y en algunas instancias requieren un profesional experimentado para aplicar el gel. No obstante, en muchas situaciones se busca mejorar cosméticamente el aspecto de los dientes al blanquearlos de forma rápida y temporaria, inmediatamente antes de una importante aparición pública o evento social.

Existe una necesidad constante de un sistema blanqueador dental temporario rápido que pueda ser aplicado en forma segura por el usuario, sin necesidad de personal dentario especialmente capacitado. El blanqueador dentario obtenido debe poder ser aplicado con facilidad sobre los dientes, y una vez aplicado, resistir su eliminación al masticar o por solvatación debida a los alimentos y las bebidas por un periodo de al menos 5-8 horas, pero a la vez poder ser eliminado por el usuario sin dañar los dientes. Al respecto, el arte previo describe cubiertas blanqueadoras dentales que se pueden aplicar al diente como auxiliar de belleza que provee blanqueo temporario inmediato cuando se aplica al esmalte dentari de la misma forma en que se aplica un esmalte de uñas, por ejemplo, el que se describe en las patentes de los Estados Unidos Nros. 4.021.915; 4.032.627; 4.482.535 y 6.210.163; sin embargo ninguna de las composiciones blanqueadores temporarias del arte previo imparten un aspecto "natural" a los dientes del usuario.

SÍNTESIS DE LA INVENCION

De acuerdo con la presente invención, se provee una composición la cual se adhiere al esmalte dental el cual imparte un efecto blanqueador discernible de inmediato al esmalte cuando se aplica al mismo cuya composición está comprendida por una combinación de un solvente para el

adhesivo.

La hidroxiapatita tiene la misma estructura física que el esmalte dental como también una fuerte afinidad por las superficies del esmalte dental con el resultado que la hidroxiapatita imparte una apariencia blanca "natural" a la superficie del esmalte en contraste con otros polvos de pigmentos blancos tales como dióxido de titanio, óxido de aluminio y óxido de zinc el cual imparte una apariencia anormal al esmalte dental.

DESCRIPCIÓN DE LAS REALIZACIONES PREFERIDAS

Vehículo Volátil

Los vehículos adecuados para ser usados en la preparación de las composiciones blanqueadoras de la presente invención incluyen solventes volátiles tales como agua, etanol y acetato de etilo, y solventes no volátiles, hidrosolubles tales como triacetina. Por lo general, el solvente en el cual se dispersa la hidroxiapatita se encuentra en la composición a una concentración desde aproximadamente 10 hasta aproximadamente 80% en peso y preferiblemente desde aproximadamente 40 hasta aproximadamente 70% en peso.

Hidroxiapatita

El agente blanqueador de hidroxiapatita utilizado en la práctica de la presente invención es una sal de fosfato de calcio que tiene la fórmula química $\text{Ca}_5(\text{OH})(\text{PO}_4)_3$. La preparación de hidroxiapatita es bien conocida en el arte, según se revela en las patentes de los Estados Unidos Nros. 4.274.879, 4.330.514, 4.324.772, 4.408.300, 4.097.935 y 4.207.300. El agente blanqueador de hidroxiapatita se encuentra en la composición blanqueadora de la presente invención en una concentración desde

136 133

aproximadamente 0,5 hasta aproximadamente 60% en peso y de preferencia desde aproximadamente 15 hasta aproximadamente 40% en peso.

La composición blanqueadora de la presente invención se puede aplicar al esmalte dental por cualquier medio adecuado como por ejemplo como una película flexible o tira o como una pintura sobre líquido.

Adhesivo Orgánico/Silicona

La composición blanqueadora dental rápida de acuerdo con la invención contiene un adhesivo orgánico dispersado o disuelto en el solvente volátil. Los polímeros orgánicos útiles como agentes de adhesión mejorados útiles en la práctica de la presente invención incluyen polímeros como carbómeros tales como los polímeros de carboximetileno como polímeros de ácido acrílico y copolímeros de ácido acrílico. El carboxipolimetileno es un polímero de vinilo ligeramente ácido con grupos carboxilo activos. Un carboxipolimetileno de preferencia para uso en la práctica de la presente invención es un copolímero de ácido acrílico reticulado con desde aproximadamente 0,75% hasta aproximadamente 1,5% de polialilsacarosa, que es sólido bajo el nombre comercial Carbopol 934, 974 por B.F. Goodrich. De preferencia, el adhesivo es una resina natural, particularmente una resina seleccionada de las resinas de goma laca, las resinas de colofonio y las resinas de colofonio modificadas. Otro grupo adecuado de adhesivos comprende las composiciones poliméricas orgánicas representadas por el grupo de resinas alquídicas, acetaldehídos de polivinil , alcoholes polivinílicos, acetatos de polivinilo, poli(óxidos de etileno), poliacrilatos, resinas cetónicas, polivinilpirrolidona, copolímero de

137 134

polivinilpirrolidona/acetato de vinilo, polietilenglicoles de peso molecular 200 a 1.000, y copolímeros en bloque de polioxietileno/polioxopropileno (Poliox), resinas siliconadas y adhesivos sensibles a la presión basados en silicona como aquellos disponibles en Dow Corning Company bajo la denominación comercial BIO-PSA.

Los adhesivos sensibles a la presión (PSA) son muy conocidos en el arte y muchos están comercialmente disponibles. En general, los PSA basados en silicona se producen por la condensación de una resina siliconada y un organosiloxano como polidiorganosiloxano. El PSA es un material elastomérico, viscoso, la adhesión del cual al esmalte dental se puede variar al alterar la relación de resina siliconada a polidiorganosiloxano en la molécula de copolímero. Por ejemplo el PSA disponible de Dow Corning Company bajo la marca BIO-PSA es un adhesivo sensible a la presión diseñado específicamente para uso farmacéutico y es permeable a muchos compuestos de drogas y encuentra aplicación para la aplicación transdermal de estos compuestos. Los polímeros de silicona BIO-PSA son los productos copolímeros de la mezcla de un polidiorganosiloxano terminado en silanol como polidimetilsiloxano con una silicona conteniendo silanol por el cual los grupos silanol del polidiorganosiloxano son sometidos a una reacción de condensación con el grupo silanol de la resina siliconada de manera que el polidiorganosiloxano está levemente reticulado por la resina siliconada (es decir, las cadenas de polidiorganosiloxano están unidas a través de las moléculas de resina para dar ramificación y enredo de cadena y/ una pequeña cantidad de carácter de red) para formar el adhesivo sensible a la

135
138

presión siliconado. Un catalizador, por ejemplo un material alcalin como amoniaco, hidróxido de amonio o carbonato de amonio se pueden mezclar con el polidiorganosiloxano terminado en silanol y la resina siliconada para promover esta reacción de reticulado.

Por la copolimerización de la resina siliconada con el polidiorganosiloxano terminado en silanol, la propiedad de auto adherencia y las propiedades cohesivas de una matriz de elastómero suave característica de polímeros sensibles a la presión y se distingue de las propiedades no elastoméricas duras de la resinas siliconadas.

Modificando la relación de resina siliconada a polidiorganosiloxanos de los adhesivos sensibles a la presión modificará la viscosidad de 1 s PSA. Por ejemplo, el adhesivo siliconado BIO PSA vendido por Dow Corning está disponible en tres relaciones de resinas siliconadas a polímeros siliconados es decir, 65/35 (baja viscosidad); 60/40 (viscosidad media), 55/45 (alta viscosidad) disueltos ya sea en solvente de acetato de etil u otro solvente.

La proporción de agente adhesivo presente en la composición de la presente invención está en el intervalo de aproximadamente 0,1% hasta aproximadamente 99% en peso y con preferencia desde aproximadamente 20 hasta aproximadamente 50% en peso de la composición.

Agentes Edulcorantes

Un material edulcorante se puede emplear en la composición blanqueadora dental de la presente invención. Los agentes edulcorantes adecuados incluyen sacarina sódico, ciclamato sódico, xilitol, aspartamo y similares, en concentraciones desde aproximadamente 0,01 hasta

136
~~134~~

aproximadamente 1% en peso, y de preferencia desde aproximadamente 0,05 hasta aproximadamente 0,75% en peso. Se prefiere sacarina sódica.

Sabor

La composición blanqueadora dental de la presente invención también puede comprender un agente saborizante. Los agentes saborizantes que se utilizan en la práctica de la presente invención incluyen aceites esenciales, además de diversos aldehídos, ésteres, alcoholes saborizantes, y materiales similares. Ejemplos de aceites esenciales incluyen aceites de menta, menta verde, gaulteria, sasafrás, clavo de olor, salvia, eucalipto, mejorana, canela, limón, lima, pomelo y naranja. También son útiles compuestos químicos tales como mentol, carvona y anetol. De estos, los más usados comúnmente son los aceites de menta verde, menta y gaulteria. El agente saborizante se incorpora en la composición del líquido blanqueador de la presente invención en una concentración desde aproximadamente 0,1 hasta aproximadamente 2% en peso, y de preferencia desde aproximadamente 0,1 hasta aproximadamente 0,5% en peso.

La composición blanqueadora de la presente invención se puede aplicar al esmalte dental por cualquier medio adecuado como por ejemplo en forma de extrusión como una tira o como líquido como un líquido para pintar.

Tira

La composición blanqueadora de hidroxiapatita de la presente invención puede estar en la forma de una tira preparada utilizando un proceso de moldeo en un solvente convencional. Por ejemplo, para preparar una tira por moldeo con solvente, donde se disuelve un polímero o resina adhesiva tal como colofonio y/o polivinilpirrolidona en una cantidad suficiente de solvente compatible como etanol. Después de formar la solución, se agrega el agente

137
110

blanqueador de hidroxiapatita en polvo y cualquier otro ingrediente tal como edulcorantes o saborizantes. La solución se coloca en un molde de material vehículo de moldeo adecuado, del cual se pueda retirar la tira formada con facilidad, sin dañarla. El material vehículo debe tener una tensión superficial el cual permite que la solución se extienda en forma pareja sobre todo el ancho del vehículo, sin empaparlo ni formar enlaces destructivos entre los dos sustratos. Ejemplos de materiales vehículos adecuados incluyen vidrio, acero inoxidable, teflón, papel kraft impregnado con polietileno. Las tiras se pueden secar hasta adoptar una forma sólida que se pueda usar, en un baño de aire a alta temperatura mediante un horno de secado, un túnel de secado, un secador de vacío cualquier otro equipo de secado adecuado con calor. Luego se retira la tira formada de la superficie del vehículo y se corta en trozos de tamaño y forma adecuados para el uso del consumidor y se embalan en un recipiente adecuado.

Para usar la tira blanqueadora de la presente invención, cuando se aplica la tira a la superficie dental, se adhiere a los dientes en forma adecuada y dentro de los siguientes 1 a 60 minutos las superficies de los dientes se blanquearán hasta una apariencia normal, a medida que la hidroxiapatita presente en la matriz de la tira migra hacia las superficies dentales. En este aspecto, la tira blanqueadora está formada para tener una adecuada dimensión en ancho necesaria para cubrir una hilera de dientes (superior o inferior). En consecuencia, se puede aplicar la tira blanqueadora al grupo de dientes superiores, o al grupo de dientes inferiores, ya sea en forma separada o simultánea. La dimensión en largo de la tira blanqueadora se determina por la cantidad de cobertura deseada. En este aspecto, la cantidad de dientes que se desea blanquear determina las dimensiones de la

138
14/11

tira blanqueadora. Por ejemplo, es posible que sólo se desee blanquear los dientes delanteros, que se ven con más facilidad. En consecuencia, en ese caso se puede reducir la longitud de la tira blanqueadora, en comparación con el caso en que se desee blanquear todos los dientes. La duración de la aplicación de la tira blanqueadora sobre los dientes dependerá del tipo y la concentración del agente blanqueador de hidroxiapatita, además del tipo y la intensidad de las manchas. La capa aplicada de hidroxiapatita resistirá la eliminación por solvatación por bebidas o masticación durante al menos 2 a 8 horas, y generalmente 3 y 5 horas. Después de haber blanqueado los dientes a satisfacción del usuario, las porciones de la tira se pueden eliminar con facilidad al enjuagar la boca con agua y cepillarse.

Blanqueador para Pintar sobre el Diente

La composición blanqueadora para pintar de la presente invención se prepara en la forma de una suspensión líquida fluida viscosa que contiene el agente blanqueador de hidroxiapatita y se aplica como tal sobre los dientes del usuario como si se pintaran los dientes con un cepillo aplicador blando de la misma manera que se aplica esmalte de uñas a una uña, y sin la intervención de un dentista u operaciones tecnológicas. La aplicación por el usuario y la evaporación o disolución del solvente deja una cubierta adherente blanca de aspecto natural sobre el diente que proporciona blanqueado instantáneo del esmalte dental.

Otras formas de aplicación de la composición blanqueadora de la presente invención incluye aplicar una tira adhesiva que tiene el agente blanqueador de hidroxiapatita incorporado en el mismo sobre la superficie de un sustrato inerte como un polietileno.

117 139

La capa de composición blanqueadora dental que se aplica al esmalte dental no contiene ingredientes que le impartan sabor o textura inaceptables, que causen molestias al usuario aunque se adhieran con fuerza al esmalte dental. La composición se adhiere lo suficiente al esmalte dental para permanecer sobre los dientes para la aplicación de la composición blanqueadora que permite que la capa aplicada resista las fuerzas comúnmente aplicadas por los labios y la lengua, además de las fuerzas que se producen durante la masticación normal, pues tras la evaporación o disolución del solvente en la boca después de la aplicación se forma una cubierta de hidroxiapatita dura se forma en alrededor de 1 minuto , cuya cubierta se fija con seguridad al esmalte del diente al que se aplicó. El usuario debe evitar masticar mientras tenga aplicada la capa de composición blanqueadora pintada sobre la superficie dental. La composición blanqueadora se puede eliminar cuando y como sea necesario, mediante procedimientos de higiene oral estándar, tales como cepillado lavado con un enjuague bucal alcohólico.

La composición blanqueadora de la presente invención se prepara por adición de la composición en un envase adecuado, como un tanque de acero inoxidable provisto de un mezclador. En la preparación de la composición blanqueadora, los ingredientes se agregan con ventaja al mezclador en el siguiente orden: solvente, materiales adhesivos, hidroxiapatita y cualquier saborizante o edulcorante deseado. Luego se mezclan los ingredientes hasta formar una dispersión homogénea. Cuando se mezcla y está lista para la extrusión o la aplicación directa como blanqueador pintado sobre la superficie, la composición en una

composición líquida viscosa coloreada opaca.

Otros ingredientes que se pueden incorporar a la composición de la presente invención incluyen cualquiera de los materiales utilizados usualmente en formulaciones de cuidado oral. Estos incluyen: agentes antimicrobianos, por ejemplo, Triclosan, clorhexidina, cobre-, zinc-, y sales estannosas como citrato de zinc, sulfato de zinc, glicinato de zinc, citrato de sodio y zinc y pirofosfato estannoso, extracto de sanguinarina, metronidazol, compuestos de amonio cuaternario, como cloruro de cetilpiridina; bis-guanidas, como clorhexidin digluconato, hexetidina, octenidina, alexidina, y compuestos bisfenolicos halogenados, como 2,2'-metilenbis-(4-cloro-6-bromofenol); agentes anti-inflamatorios como ibuprofeno, flurbiprofeno, aspirina, indometacina, etc; agentes anti-caries como fluoruro de sodio-, calcio-, magnesio-, y estannoso, aminofluoruros, monofluorofosfato de disodio y trimeta fosfato de sodio; buffers de placa como urea, lactato de calcio, glicerofosfato de calcio y poliacrilatos de estroncio; vitaminas como vitamina C; extractos de palntas, agentes desensibilizantes, por ejemplo, citrato de potasio, cloruro de potasio, tartrato de potasio, bicarbonato de potasio, oxalato de potasio, nitrato de potasio y sales de estroncio; agentes efectivos contra calculus dental como sales de pirofosfato incluyendo di, tri y tetra alquil metal y pirofosfato de amonio y sales de tripolifosfato; biomoléculas, por ejemplo, bacteriocinas, anticuerpos, enzimas como papaina, glucosamilasa; agentes opacadores, pigmentos, agentes colorantes y sales que proporcionan iones flúor que tienen eficacia anticaries como fluoruro de sodio, fluoruro de potasio, un fluoruro de estaño como fluoruro estannoso.

141

La presente invención se ilustra con los siguientes ejemplos, pero sin que representen limitaciones.

Ejemplo

Una serie de tiras blanqueadoras de hidroxiapatita con los ingredientes enumerados en la siguiente Tabla I.

TABLA I					
Composición de la tira	A	B	C	D	E
Etanol	35,73	31,02	35,73	35,73	0
Acetato de etilo	0	0	0	0	37,7
Polivinilpirrolidona/acetato de vinilo	8,91	8,68	0	0	6,0
Polivinilpirrolidona	0	0	8,91	0	2,9
Hidroxiapatita	19,62	24,32	19,62	19,62	19,62
Colofonio	35,74	31,02	35,74	35,74	31,7
PEG 600	0	4,6	0	0	3,0
Poliox	0	0	0	7,0	0
Agua	0	0	0	1,91	0
Total (%)	100,0	100,0	100,0	100,0	100,0

Las composiciones de las tiras de la Tabla I se prepararon mediante el agregado lento del material adhesivo (por ejemplo colofoni , polivinilpirrolidona, polivinilpirrolidona/acetato de vinilo, Poliox, PEG 600 o las mezclas correspondientes) en el solvente (etanol, acetato de etilo) con agitación vigorosa para formar una solución translúcida y viscosa. Se agregó polvo de hidroxiapatita a esta solución y se mezcló bien. La mezcla blanca obtenida se moldea en papel kraft con cubierta de polietileno y se dejar secar durante la noche. Se forma una tira coloreada de blanco que se puede despegar fácilmente de la placa. La tira seca tiene un espesor aproximado de unos 0,1 a 0,25 mm. La eficacia blanqueadora de la tira se examinó mojando y colocando partes de la tiras (13 mm veces 100mm pesando 150-500 miligramos (mg) contra la superficie del diente del sujeto

142
Lfb

que tiene dientes manchados, y se registró el tiempo necesario para que l s
dientes asuman un color blanco natural. Los resultados se registraron en la
siguiente Tabla II.

TABLA II	
Composición	Tiempo para blanquear los dientes (minutos)
A	20
B	15
C	12
D	10
E	5

Luego de la aplicación la película que se formó sobre los dientes
imparte un blanco natural a los dientes y permanece en los dientes durante
3 a 8 horas antes de intentar removerlo.

Ejemplo II

Se prepara una serie de composiciones blanqueadoras para pintar la
superficie que contienen los ingredientes incluidos en la siguiente Tabla III.

TABLA II						
Composiciones de líquido para pintar superficies						
	F	G	H	I	J	K
BIO-PSA*	50	40	25	50	25	34,9
Acetato de etilo	33	48	48	20	45	40
Aceite mineral	2	2	2	—	2	—
Acetina	—	—	—	10	—	—
Hidroxiapatita	5	10	25	20	25	25
Carbopol 974	—	—	—	—	3	0,1
*adhesivo sensible a presión en base a polímero de silicona						

LC/8-143

La composición se pintó sobre la superficie dental para impartir un aspecto blanco natural a los dientes durante 3 a 8 horas antes de intentar eliminarla.

74/9
144

REIVINDICACIONES

Lo que se reivindica es:

1. Una composición blanqueadora dental temporaria rápida que comprende un agente adhesivo y hidroxiapatita cuya composición imparte un aspecto blanco natural al esmalte dental cuando se aplica al mismo.
2. La composición de acuerdo con la reivindicación 1, en donde la composición contiene 0,1 hasta 99% en peso del adhesivo, y desde aproximadamente 0,5 hasta aproximadamente 60% en peso de hidroxiapatita de calcio.
3. La composición de acuerdo con la reivindicación 1, en donde dicho adhesivo se selecciona del grupo que consiste en resinas naturales, resinas naturales modificadas y adhesivos sensibles a la presión.
4. La composición de acuerdo con la reivindicación 1, en donde dicho adhesivo se selecciona de polivinilpirolidona, copolímeros de polivinilpirolidona/acetato de vinilo y polietilenglicol.
5. La composición de acuerdo con la reivindicación 1, la cual está en la forma de una tira que puede ser aplicada y adherida al esmalte dental.
6. La composición de acuerdo con la reivindicación 1, la cual está en la forma de una dispersión líquida para pintar.
7. Un método para blanquear dientes que los pasos de:
 - a) aplicar una composición de acuerdo con la reivindicación 1 a la superficie del esmalte; y
 - b) permitir que la composición se seque sobre dicha superficie

130
145

RESUMEN

Una composición para blanquear los dientes de forma rápida y temporaria, que comprende una combinación de un material adhesivo y hidroxiapatita.

146 157

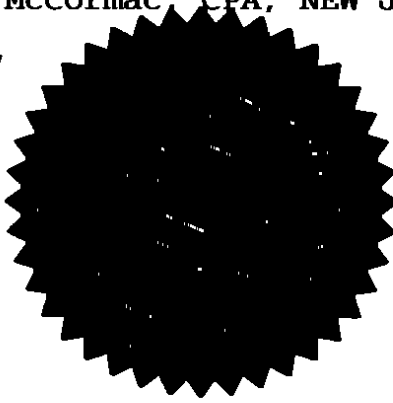
APOSTILLE

(CONVENTION DE LA HAYE DU 5 OCTOBRE 1961)

1. COUNTRY: UNITED STATES OF AMERICA
2. THIS PUBLIC DOCUMENT HAS BEEN SIGNED BY:
ELAINE M FLYNN
3. ACTING IN THE CAPACITY OF:
COUNTY CLERK
4. BEARS THE SEAL/STAMP OF:
COUNTY OF MIDDLESEX

CERTIFIED

5. AT TRENTON, NEW JERSEY
6. THE 9TH DAY OF JANUARY 2006
7. BY: John E McCormac CPA, NEW JERSEY TREASURER
8. NO. A248577
9. SEAL/STAMP:
10. SIGNATURE



John E McCormac



I, ELAINE M. FLYNN, Clerk of the County of Middlesex, do hereby certify that

CAROL M STANLEY

whose name is subscribed to the annexed certificate or proof of acknowledgment of the annexed instrument was at the time of taking the same a

NOTARY PUBLIC OF NEW JERSEY
acting in and for said county, duly commissioned and sworn, and qualified to act as such; that as such

NOTARY PUBLIC OF NEW JERSEY
he was duly authorized by the laws of the State of New Jersey to take and certify depositions; to administer oaths and affirmations; to take affidavits and certify the acknowledgment and proof of deeds and other written instruments for lands, tenements and hereditaments to be read in evidence or recorded in this state; and further, that I am well acquainted with the handwriting of such

NOTARY PUBLIC OF NEW JERSEY
and verify that the signature to such proof or acknowledgment is genuine.

IN TESTIMONY WHEREOF, I have hereto set my hand and affixed the seal of the County of Middlesex, this 17 day
of November 2025

Elaine M. Flynn CLERK

112
108

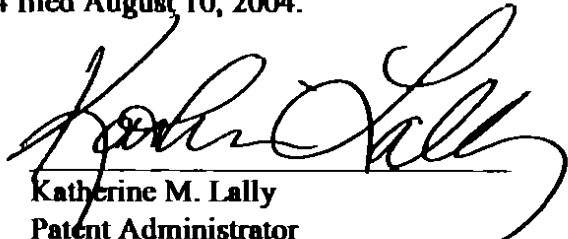
7345-00

COUNTY OF MIDDLESEX

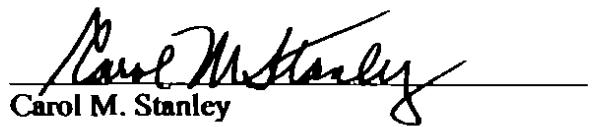
STATE OF NEW JERSEY

UNITED STATES OF AMERICA

I, Katherine M. Lally, of COLGATE-PALMOLIVE COMPANY, do hereby declare that the copy attached hereto are true photocopies of the assignments in support of U.S. Serial Nos. 10/641,963 filed August 15, 2003 and 10/915,124 filed August 10, 2004.


Katherine M. Lally
Patent Administrator
Colgate-Palmolive Company

Subscribed and sworn to
before me this 2 day
of November, 2005.


Carol M. Stanley
Notary Public of New Jersey
My Commission Expires November 18, 2005

ASSIGNMENT

WHEREAS, we, Sayed Ibrahim, Suman K. Chopra, Michael Prencipe (below referred to as ASSIGNORS, residing, respectively, as set forth hereinafter, have made an invention for which application for Letters Patent of the United States was filed in the United States Patent and Trademark Office as Application Serial No. 10/641,963 filed August 15, 2003 naming the ASSIGNORS as an inventor, and entitled Rapid Temporary Tooth Whitening Composition; and

WHEREAS, Colgate-Palmolive Company, a corporation duly organized and existing under the laws of the State of Delaware, United States of America and having its principal office and place of business at 300 Park Avenue, New York, New York 10022, and offices and place of business at 909 River Road, Piscataway, New Jersey 08855 (below referred to as "ASSIGNEE"), is desirous of obtaining the entire right, title and interest in and to the aforesaid invention and patent application and corresponding patent rights worldwide;

NOW, THEREFORE, in consideration of good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, ASSIGNORS, by these presents do sell, assign and transfer to ASSIGNEE, the full and exclusive right, title and interest in and to the aforesaid invention, the aforesaid U.S. and all corresponding foreign patent applications, all divisional, continuation, continuation-in-part, reissue and reexamination applications of the aforesaid U.S. application, and all Letters Patent or comparable rights issuing thereon in the United States and in all foreign countries, together with the right of priority under the International Convention for the Protection of Industrial Property, Inter-American Convention Relating to Patents, Designs and Industrial Models, and any other international agreements to which the United States of America adheres, and the ASSIGNORS hereby authorize and request the U.S. Commissioner of Patents and Trademarks and all foreign Patent Offices to issue all Letters Patent or comparable rights issuing on any application as aforesaid to ASSIGNEE, or to its successors, assigns or legal representatives;

ASSIGNORS hereby covenant that ASSIGNORS have full right to convey the entire interest herein assigned, and that ASSIGNORS have not executed, and will not execute, any agreement in conflict herewith;

ASSIGNORS agree to communicate to ASSIGNEE or to its successors, assigns or legal representatives any and all facts known to them or any of them respecting said invention, and without further remuneration to testify in any legal proceeding, sign all lawful papers, execute all divisional, continuation, continuation-in-part, reissue and reexamination applications, make all rightful oaths and generally do all lawful acts to aid ASSIGNEE or its successors, assigns or legal representatives to obtain and enforce proper patent protection for said invention in all countries and to enhance or perfect ASSIGNEE's title in and to the invention and patent rights therein.

ASSIGNORS hereby authorize attorneys for ASSIGNEE to enter on this document any applicable serial numbers and filing dates after ASSIGNORS' execution of this document.

This Assignment is effective as of August 15, 2003

150

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 15 day of
August 2003.

Sayed Ibrahim
Sayed Ibrahim
152 Kingsberry Drive
Somerset, New Jersey 08873, USA

State of New Jersey
County of Middlesex

On this 15 day of August 2003, before me, a Notary Public in and
for the State and County aforesaid, personally appeared the above signatory, known to me to be the
person of that name, who executed the foregoing instrument in my presence.

MARIA V. LOGATTO
Notary Public of New Jersey
My Commission Expires 8/8/2005

Maria V. Logatto
NOTARY PUBLIC

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 15 day of
Aug. 2003.

Suman K. Chopra
Suman K. Chopra
505 Major Road
Dayton, New Jersey 08810, USA

State of New Jersey
County of Middlesex

On this 15 day of August 2003, before me, a Notary Public in and
for the State and County aforesaid, personally appeared the above signatory, known to me to be the
person of that name, who executed the foregoing instrument in my presence.

MARIA V. LOGATTO
Notary Public of New Jersey
My Commission Expires 8/8/2005

Maria V. Logatto
NOTARY PUBLIC

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 15 day of
August 2003.

Michael Principe
Michael Principe
39 Spruce Street
West Windsor, New Jersey 08550, USA

State of New Jersey
County of Middlesex

On this 15 day of August 2003, before me, a Notary Public in and
for the State and County aforesaid, personally appeared the above signatory, known to me to be the
person of that name, who executed the foregoing instrument in my presence.

MARIA V. LOGATTO
Notary Public of New Jersey
My Commission Expires 8/8/2005

Maria V. Logatto
NOTARY PUBLIC

HF

ASSIGNMENT

WHEREAS, we, Sayed Ibrahim, Suman K. Chopra, Michael Principe (below referred to as ASSIGNOR(S)), residing, respectively, as set forth hereinafter, have made an invention for which application for Letters Patent of the United States was filed in the United States Patent and Trademark Office as Application Serial No. 10/915,124 filed 8/10/2004 naming the ASSIGNOR(S) as an inventor, and entitled Rapid Temporary Tooth Whitening Composition; and

WHEREAS, Colgate-Palmolive Company, a corporation duly organized and existing under the laws of the State of Delaware, United States of America and having its principal office and place of business at 300 Park Avenue, New York, New York 10022, and offices and place of business at 909 River Road, Piscataway, New Jersey 08855 (below referred to as "ASSIGNEE"), is desirous of obtaining the entire right, title and interest in and to the aforesaid invention and patent application and corresponding patent rights worldwide;

NOW, THEREFORE, in consideration of good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, ASSIGNORS, by these presents do sell, assign and transfer to ASSIGNEE, the full and exclusive right, title and interest in and to the aforesaid invention, the aforesaid U.S. and all corresponding foreign patent applications, all divisional, continuation, continuation-in-part, reissue and reexamination applications of the aforesaid U.S. application, and all Letters Patent or comparable rights issuing thereon in the United States and in all foreign countries, together with the right of priority under the International Convention for the Protection of Industrial Property, Inter-American Convention Relating to Patents, Designs and Industrial Models, and any other international agreements to which the United States of America adheres, and the ASSIGNORS hereby authorize and request the U.S. Commissioner of Patents and Trademarks and all foreign Patent Offices to issue all Letters Patent or comparable rights issuing on any application as aforesaid to ASSIGNEE, or to its successors, assigns or legal representatives;

ASSIGNORS hereby covenant that ASSIGNORS have full right to convey the entire interest herein assigned, and that ASSIGNORS have not executed, and will not execute, any agreement in conflict herewith;

ASSIGNORS agree to communicate to ASSIGNEE or to its successors, assigns or legal representatives any and all facts known to them or any of them respecting said invention, and without further remuneration to testify in any legal proceeding, sign all lawful papers, execute all divisional, continuation, continuation-in-part, reissue and reexamination applications, make all rightful oaths and generally do all lawful acts to aid ASSIGNEE or its successors, assigns or legal representatives to obtain and enforce proper patent protection for said invention in all countries and to enhance or perfect ASSIGNEE's title in and to the invention and patent rights therein.

ASSIGNORS hereby authorize attorneys for ASSIGNEE to enter on this document any applicable serial numbers and filing dates after ASSIGNORS' execution of this document.

This Assignment is effective as of August 10, 2004
(Date of Filing)

(Assignment con't)

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 26 day of October 2004.

Address:

Sayed Ibrahim
152 Kingsberry Drive
Somerset, New Jersey 08873

State of New Jersey
County of Middlesex

On this 26 day of October 2004, before me, a Notary Public in and for the State and County aforesaid, personally appeared the above signatory, known to me to be the person of that name, who executed the foregoing instrument in my presence.

MARIA V. LOGATTO
Notary Public of New Jersey
My Commission Expires 8/8/2005

NOTARY PUBLIC

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 22 day of Oct. 2004.

Address:

Suman K. Chopra
505 Major Road
Dayton, New Jersey 08810

State of New Jersey
County of Middlesex

On this 22 day of October 2004, before me, a Notary Public in and for the State and County aforesaid, personally appeared the above signatory, known to me to be the person of that name, who executed the foregoing instrument in my presence.

MARIA V. LOGATTO
Notary Public of New Jersey
My Commission Expires 8/8/2005

NOTARY PUBLIC

IN TESTIMONY WHEREOF, I hereunto set my hand and seal this 22 day of October 2004.

Address:

Michael Principe
39 Spruce Street
West Windsor, New Jersey 08550

State of New Jersey
County of Middlesex

On this 22 day of October 2004, before me, a Notary Public in and for the State and County aforesaid, personally appeared the above signatory, known to me to be the person of that name, who executed the foregoing instrument in my presence.

MARIA V. LOGATTO
Notary Public of New Jersey
My Commission Expires 8/8/2005

Maria V. Logatto
NOTARY PUBLIC

Colgate-Palmolive Company accepts this Assignment.

COLGATE-PALMOLIVE COMPANY

By

Ethan K. Park
Ethan K. Park
Associate General Counsel &
Chief Patent Counsel

154
H K

TRADUCCIÓN AL ESPAÑOL del documento de cesión de solicitud de patente a
Colgate-Palmolive Company, firmado por los cedentes y el cesionario.

APOSTILLA

(Convención de La Haya del 5 de Octubre de 1961)

1. PAÍS: ESTADOS UNIDOS DE AMERICA
2. ESTE DOCUMENTO PÚBLICO HA SIDO FIRMADO POR:
ELAINE M. FLYNN
3. ACTUANDO EN CAPACIDAD DE:
FUNCIONARIO DEL CONDADO
4. LLEVA EL SELLO/TIMBRE DE:
CONDADO DE MIDDLESEX

CERTIFICADO

5. EN TRENTON, NEW JERSEY
6. EL 9 DE ENERO DE 2006
7. POR John E. McCormac, CPA, TESORERO DE NEW JERSEY
8. NO. A248577
9. SELLO/TIMBRE
10. FIRMA

John McCormac (Firma)

155
HJ

CONDADO DE MIDDLESEX

ESTADO DE NEW JERSEY

ESTADOS UNIDOS DE AMERICA

Yo Katherine M. Lally, de COLGATE-PALMOLIVE COMPANY, declaro que las copias anexas al presente son fotocopias verdaderas de las cesiones como base de U.S. número de serie 10/641,963 presentada el 15 de agosto de 2003, y 10/915,124 presentada el 10 de agosto de 2004.

(Firma)
Katherine M. Lally
Administrador de Patentes
Colgate-Palmolive Company

Suscrito y jurado
Ante mi este 2
de noviembre de 2005.

Carol M. Stanley (Firma)
Carol M. Stanley
Notario Público de New Jersey
Mi comisión expira el 22 de noviembre de 2010

ESTADO DE NEW JERSEY
Condado de Middlesex

Yo, Elaine M. Flinn, Funcionario del Condado de Middlesex, certifico que

CAROL M. STANLEY

Cuyo nombre aparece suscrito al certificado de prueba de reconocimiento del instrumento adjunto era al momento de tomar el mismo un

NOTARIO PUBLICO DE NEW JERSEY

Actuando en y para dicho condado, debidamente comisionada y juramentada, y calificada para actuar como tal; que como tal

NOTARIO PUBLICO DE NEW JERSEY

Estaba debidamente autorizada por las leyes del Estado de New Jersey para tomar y certificar declaraciones; para administrar juramentos y promesa solemnes; para tomar declaraciones juradas por escrito y certificar el reconocimiento y la prueba de instrumentos jurídicos y otros instrumentos escritos para tierras, arrendamientos y herencias ser leídos como evidencia o registrados en este estado; y además, que estoy familiarizada con la firma de tal

NOTARIO PUBLICO DE NEW JERSEY

Y verifico que la firma de tal prueba o reconocimiento es genuina.

EN TESTIMONIO DE LO CUAL, e firmado el presente y fijado el sello del Condado de Middlesex este 17 de noviembre de 2005.

Elaine M. Flinn (Firma)

156
HCO

CESIÓN

CONSIDERANDO QUE, nosotros, Sayed Ibrahim, Suman K. Chopra, Michael Principe (referidos de bajo como CEDENTES), residiendo, respectivamente, como se establece adelante, hemos hecho una invención para la cual se presentó solicitud de patente de Estados Unidos en la Oficina de Marcas y Patentes de Estados Unidos como solicitud con número de serie 10/641,963 presentada el 15 de agosto de 2003, nombrando a los CEDENTES como inventores y titulada Composición blanqueadora rápida temporal de dientes; y

CONSIDERANDO QUE, Colgate-Palmolive Company, una corporación debidamente organizada y existente bajo las leyes del Estado de Delaware, Estados Unidos de América y que tiene sus oficinas principales y lugar de operación en 300 Park Avenue, New York, New York 10022, y oficinas y lugar de operación en 909 River Road, Piscataway, New Jersey 08855 (referido debajo como CESIONARIO), tiene deseos de obtener la totalidad del derecho, título e intereses en y para la invención y solicitud de patente mencionadas arriba y los correspondientes derechos de patente alrededor del mundo.

AHORA, POR LO TANTO, en consideración de la consideración buena y valiosa, el recibo y la suficiencia de la cual se reconocen, los CEDENTES, por la presente venden, ceden y transfieren al CESIONARIO el derecho, título e interés completo y exclusivo en y para la invención arriba mencionada, la solicitud de patente de los Estados Unidos arriba mencionada y todas las solicitudes de patente extranjeras correspondientes, todas las solicitudes de división, continuación, continuación parcial, reemisión y reexaminación de la solicitud de patente de los Estados Unidos arriba mencionada, y todas las Patentes o derechos comparables emitidos sobre la misma en los Estados Unidos y en todos los países extranjeros, junto con el derecho de prioridad bajo la Convención Internacional para la Protección de la Propiedad Industrial, la Convención Interamericana Relacionada con Patentes, Diseños y Modelos Industriales, u cualquier otro acuerdo internacional al cual se adhieran los Estados Unidos, y los CEDENTES por la presente autorizan y solicitan al Comisionado de Marcas y Patentes de los Estados Unidos y a todas las Oficinas de Patentes extranjeras a emitir todas las patentes o derechos comparables que puedan surgir de cualquier solicitud al CESIONARIO, o sus sucesores, cesionarios o representantes legales;

Los CEDENTES garantizan que los CEDENTES tienen pleno derecho para comunicar la totalidad del interés aquí cedido, y que los CEDENTES no han ejecutado, y no ejecutarán, ningún acuerdo en conflicto con el presente;

Los CEDENTES acuerdan comunicar al CESIONARIO o a sus sucesores, cesionarios o representantes legales cualquiera y todos los hechos conocidos por ellos o por cualquiera de ellos respecto a dicha invención, y sin remuneración adicional testificar en cualquier proceso legal, firmar todos los papeles legales, ejecutar todas las solicitudes de división, continuación, continuación parcial, reemisión y reexaminación, hacer todos los juramentos correctos y en general hacer todos los actos legales para ayudar al CESIONARIO o sus sucesores, cesionarios o representantes legales a obtener y hacer valer la protección de patente para dicha invención en todos los países y a mejorar o perfeccionar el derecho del CESIONARIO en y para la invención y los derechos de patente de la misma.

Los CEDENTES por la presente autorizan a los abogados del CESIONARIO a ingresar en este documento cualquier número de serie y fecha de presentación aplicable después que el CEDENTE ha ejecutado este documento.

Esta cesión es efectiva desde: Agosto 15 de 2003

157
166

EN TESTIMONIO DE LO CUAL he puesto mi firma y fijado mi sello este 15 de agosto de 2003.

(Firma)
Sabed Ibrahim
Dirección: 152 Kingsberry Drive
Somerset, New Jersey 08873, EE.UU.

Estado de New Jersey
Condado de Middlesex

Este 15 de agosto de 2003, ante mi, un notario público en y para el Estado y Condado arriba mencionados, apareció personalmente el arriba firmante, a quien conozco como la persona de ese nombre quien ejecutó el instrumento anterior en mi presencia.

MARIA V. LOGATTO
Notario Público de New Jersey
Mi comisión expira 8/8/2005

(Firma)
NOTARIO PUBLICO

EN TESTIMONIO DE LO CUAL he puesto mi firma y fijado mi sello este 15 de agosto de 2003.

(Firma)
Suman K. Chopra
Dirección: 505 Major Road
Dayton, New Jersey 08810, EE.UU.

Estado de New Jersey
Condado de Middlesex

Este 15 de agosto de 2003, ante mi, un notario público en y para el Estado y Condado arriba mencionados, apareció personalmente el arriba firmante, a quien conozco como la persona de ese nombre quien ejecutó el instrumento anterior en mi presencia.

MARIA V. LOGATTO
Notario Público de New Jersey
Mi comisión expira 8/8/2005

(Firma)
NOTARIO PUBLICO

EN TESTIMONIO DE LO CUAL he puesto mi firma y fijado mi sello este 15 de agosto de 2003.

(Firma)
Michael Prencipe
Dirección: 39 Spruce Street
West Windsor, New Jersey 08550, EE.UU.

Estado de New Jersey
Condado de Middlesex

Este 15 de agosto de 2003, ante mi, un notario público en y para el Estado y Condado arriba mencionados, apareció personalmente el arriba firmante, a quien conozco como la persona de ese nombre quien ejecutó el instrumento anterior en mi presencia.

MARIA V. LOGATTO
Notario Público de New Jersey
Mi comisión expira 8/8/2005

(Firma)
NOTARIO PUBLICO

158
t62

CESIÓN

CONSIDERANDO QUE, nosotros, Sayed Ibrahim, Suman K. Chopra, Michael Principe (referidos de bajo como CEDENTES), residiendo, respectivamente, como se establece adelante, hemos hecho una invención para la cual se presentó solicitud de patente de Estados Unidos en la Oficina de Marcas y Patentes de Estados Unidos como solicitud con número de serie 10/641,963 presentada el 8/10/2004, nombrando a los CEDENTES como inventores y titulada Composición blanqueadora rápida temporal de dientes; y

CONSIDERANDO QUE, Colgate-Palmolive Company, una corporación debidamente organizada y existente bajo las leyes del Estado de Delaware, Estados Unidos de América y que tiene sus oficinas principales y lugar de operación en 300 Park Avenue, New York, New York 10022, y oficinas y lugar de operación en 909 River Road, Piscataway, New Jersey 08855 (referido debajo como CESIONARIO), tiene deseos de obtener la totalidad del derecho, título e intereses en y para la invención y solicitud de patente mencionadas arriba y los correspondientes derechos de patente alrededor del mundo.

AHORA, POR LO TANTO, en consideración de la consideración buena y valiosa, el recibo y la suficiencia de la cual se reconocen, los CEDENTES, por la presente venden, ceden y transfieren al CESIONARIO el derecho, título e interés completo y exclusivo en y para la invención arriba mencionada, la solicitud de patente de los Estados Unidos arriba mencionada y todas las solicitudes de patente extranjeras correspondientes, todas las solicitudes de división, continuación, continuación parcial, reemisión y reexaminación de la solicitud de patente de los Estados Unidos arriba mencionada, y todas las Patentes o derechos comparables emitidos sobre la misma en los Estados Unidos y en todos los países extranjeros, junto con el derecho de prioridad bajo la Convención Internacional para la Protección de la Propiedad Industrial, la Convención Interamericana Relacionada con Patentes, Diseños y Modelos Industriales, u cualquier otro acuerdo internacional al cual se adhieran los Estados Unidos, y los CEDENTES por la presente autorizan y solicitan al Comisionado de Marcas y Patentes de los Estados Unidos y a todas las Oficinas de Patentes extranjeras a emitir todas las patentes o derechos comparables que puedan surgir de cualquier solicitud al CESIONARIO, o sus sucesores, cesionarios o representantes legales;

Los CEDENTES garantizan que los CEDENTES tienen pleno derecho para comunicar la totalidad del interés aquí cedido, y que los CEDENTES no han ejecutado, y no ejecutarán, ningún acuerdo en conflicto con el presente;

Los CEDENTES acuerdan comunicar al CESIONARIO o a sus sucesores, cesionarios o representantes legales cualquiera y todos los hechos conocidos por ellos o por cualquiera de ellos respecto a dicha invención, y sin remuneración adicional testificar en cualquier proceso legal, firmar todos los papeles legales, ejecutar todas las solicitudes de división, continuación, continuación parcial, reemisión y reexaminación, hacer todos los juramentos correctos y en general hacer todos los actos legales para ayudar al CESIONARIO o sus sucesores, cesionarios o representantes legales a obtener y hacer valer la protección de patente para dicha invención en todos los países y a mejorar o perfeccionar el derecho del CESIONARIO en y para la invención y los derechos de patente de la misma.

Los CEDENTES por la presente autorizan a los abogados del CESIONARIO a ingresar en este documento cualquier número de serie y fecha de presentación aplicable después que el CEDENTE ha ejecutado este documento.

Esta cesión es efectiva desde: Agosto 10 de 2004

159
(6)

EN TESTIMONIO DE LO CUAL he puesto mi firma y fijado mi sello este 26 de octubre de 2004

(Firma)
Saber Ibrahim
Dirección: 152 Kingsberry Drive
Somerset, New Jersey 08873, EE.UU.

Estado de New Jersey
Condado de Middlesex

Este 26 de octubre de 2004, ante mí, un notario público en y para el Estado y Condado arriba mencionados, apareció personalmente el arriba firmante, a quien conozco como la persona de ese nombre quien ejecutó el instrumento anterior en mi presencia.

MARIA V. LOGATTO
Notario Público de New Jersey
Mi comisión expira 8/8/2005

(Firma)
NOTARIO PUBLICO

EN TESTIMONIO DE LO CUAL he puesto mi firma y fijado mi sello este 22 de octubre de 2004.

(Firma)
Suman K. Chopra
Dirección: 505 Major Road
Dayton, New Jersey 08810, EE.UU.

Estado de New Jersey
Condado de Middlesex

Este 22 de octubre de 2004, ante mí, un notario público en y para el Estado y Condado arriba mencionados, apareció personalmente el arriba firmante, a quien conozco como la persona de ese nombre quien ejecutó el instrumento anterior en mi presencia.

MARIA V. LOGATTO
Notario Público de New Jersey
Mi comisión expira 8/8/2005

(Firma)
NOTARIO PUBLICO

165

EN TESTIMONIO DE LO CUAL he puesto mi firma y fijado mi sello este 22 de octubre de 2004.

(Firma)
Michael Prencipe
Dirección: 39 Spruce Street
West Windsor, New Jersey 08550, EE.UU.

Estado de New Jersey
Condado de Middlesex

Este 22 de octubre de 2004, ante mí, un notario público en y para el Estado y Condado arriba mencionados, apareció personalmente el arriba firmante, a quien conozco como la persona de ese nombre quien ejecutó el instrumento anterior en mi presencia.

MARIA V. LOGATTO
Notario Público de New Jersey
Mi comisión expira 8/8/2005

(Firma)
NOTARIO PUBLICO

Colgate-Palmolive acepta esta Cesión:

COLGATE-PALMOLIVE COMPANY

Por: _____
(Firma)
Ellen K. Park
Abogado General Asociado &
Abogado en Jefe de Patentes

161
161

CLERK
NEW YORK
COUNTY

252373

I, NORMAN GOODMAN, County Clerk and Clerk of the Supreme Court of the State of New York, in and for the County of New York, a Court of Record, having by law a seal, DO HEREBY CERTIFY pursuant to the Executive Law of the State of New York that

Rosie S. DiZona

whose name is subscribed to the enclosed affidavit, deposition, certificate of acknowledgment, or other instrument, was at the time of taking the same a NOTARY PUBLIC in and for the State of New York duly commissioned, sworn and qualified to act as such that pursuant to law, a commission or a certificate of his official character, with his autograph signature has been filed in my office that at the time of taking such proof, acknowledgment or other instrument was duly authorized to take the same that I am well acquainted with the handwriting of such NOTARY PUBLIC and have compared the signature on the enclosed instrument with his autograph signature deposited in my office, and I believe that such signature is genuine.

IN WITNESS WHEREOF, I have hereunto set my hand signed my official seal this

OCT 30 2001

FEE PAID \$3.00

Norman Goodman
County Clerk and Clerk of the Supreme Court, New York County

En la Notaría Pública de este Estado se
certificó y se inscribió el concepto que acompaña con
el original
4 FEB. 2006
NOTARIO CUARENTA
Agustín Castillo Zárate
Bogotá, D.C., Colombia

Apostille

166 162

(Convention de La Haye du 5 Octobre 1961)

1. Country: **United States of America**

This public document

2. has been signed by **Norman Goodman**

3. acting in the capacity of **County Clerk**

4. bears the seal/stamp of the county of **New York**

Certified

5. At **New York, New York** 6. the **30th** day of **October 2001**

7. by **Special Deputy Secretary of State, State of New York**

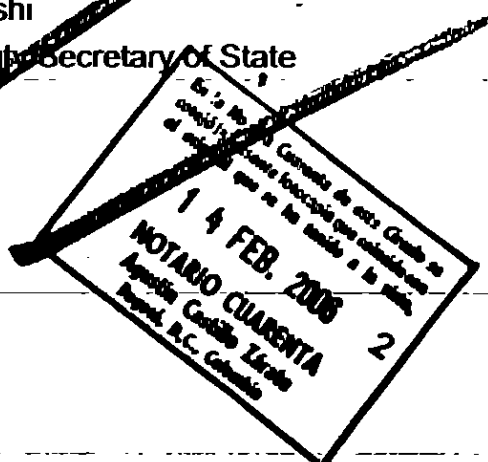
8. **No. NYC-9786540B**

9. **Seal/Stamp**

10. **Signature**



Aqil M. Qureshi
Aqil M. Qureshi
Special Deputy Secretary of State



Brigard & Castro

SANTA FE DE BOGOTA - COLOMBIA

PODER

POWER OF ATTORNEY

Yo (nosotros)

domiciliado(s) en

Nombro(amos) a: RAMIRO CASTRO DUQUE y/o JUAN PABLO CADENA SARMIENTO y/o BEATRIZ JARAMILLO S.

de Santafé de Bogotá, Colombia, apoderados verdaderos y legales con poder especial, amplio y suficiente, para recabar de las oficinas y autoridades colombianas administrativas, judiciales y de policía, en cualquier instancia o recurso, la obtención de patentes de invención, registros de marcas, diseños industriales, modelos de utilidad, depósitos de nombres comerciales y enseñanzas, registros de derechos de autor y contratos sobre los mismos, obtención de certificados de obtentor de variedades vegetales, así como sus prórrogas, renovaciones, anotaciones de traspaso, cambios de nombre y/o domicilio; elaborar, tramitar y registrar contratos de licencia y licencias de cualesquiera clases; intervenir como demandante o como demandado en cualquier instancia y recurso ante cualquier juez, corporación, funcionario público o autoridad en acciones judiciales, administrativas y de policía tales como: oposiciones al registro de marcas; acciones de caducidad, cancelación y nulidad; acciones reivindicatorias, acciones derivadas de la obtención o explotación de licencias; acciones de competencia desleal; demandas penales; acciones de indemnización de perjuicios, reclamos y observaciones a solicitudes de patentes, diseños industriales, modelos de utilidad, en el ejercicio de medidas cautelares y en otras acciones o medidas similares.

A este efecto, lo(s) facuto(amos) para elevar solicitudes, formular descripciones, enmiendas, protestas, declaraciones, oposiciones, cancelaciones, nulidades, apelaciones y reclamos; pagar impuestos, cuotas y gravámenes prescritos por la ley; renunciar o desistír a derechos concedidos o en curso de concesión; recibir toda clase de documentos y valores, dando el descargo respectivo, y, en general, para dar ante dichas autoridades todos los pasos necesarios al efecto indicado y tomar todas las medidas que creyeren conducentes al resguardo de mis (nuestros) intereses), con todas las demás facultades legales necesarias.

Este poder comprende la facultad de ratificar o confirmar en mi (nuestro) nombre lo actuado así como la facultad de desistír, transigir, comprometer y la de sustituirlo en todo o en parte por advocar sustituciones. Asimismo nombro(amos) a RAMIRO CASTRO DUQUE y/o JUAN PABLO CADENA SARMIENTO y/o BEATRIZ JARAMILLO S.

domiciliado(s) en la Carrera 7 No. 16-56 Piso 9, mis (nuestros) apoderados en Colombia, con facultades para recibir notificaciones y designar apoderados judiciales o extrajudiciales.

I (We)

COLGATE-PALMOLIVE COMPANY, a Delaware corporation, of 300 Park Avenue, New York, New York 10022, U. S. A.

Hereby appoint RAMIRO CASTRO DUQUE and/or JUAN PABLO CADENA SARMIENTO and/or BEATRIZ JARAMILLO S.

of Santafé de Bogotá, Colombia, my (our) true and lawful attorneys with special, ample and sufficient power to obtain from the Colombian administrative, judicial and police offices and authorities, in any instance, privileges of patents of invention, registration of trademarks, industrial designs and utility models; registration of commercial names and emblems, registration of copyright and contracts related thereto, certificates of obtainors of vegetable varieties, as well as extensions, renewals and recordal of assignments and changes of name and domicile related to the above; to prepare, prosecute and register licenses of any kind; to act as plaintiff or defendant in any instance or recourse, and before any judge, corporation, public official or authority in judicial, administrative and police actions, such as: oppositions to the registration of trademarks; caducity, cancellation and nullity actions; claim actions derived from the obtaining or exploitation of licenses, action of unfair competition; penal demands, actions of indemnities for damages; claims or observations on patent applications, models, industrial designs and utility models; in the exercise of preventive measures; and in other actions or similar proceedings.

To that effect they are hereby empowered to file applications, formulate descriptions, amendments, protests, declarations, oppositions, cancellations, nullities, appeals and claims; to pay taxes, quotas and assessments prescribed by law, renounce or waive the rights granted or in the process of granting; to receive all kind of documents and values, giving the necessary discharge of receipt and, in general, to take before the authorities the necessary steps to such effect, and to take all measures that they may deem pertinent for the safeguard of my (our) interest(s) with all the other necessary legal powers.

This power includes the faculty to ratify or confirm what has been done or compromised on my (our) behalf, and to substitute the power in whole or in part and to revoke substitutions at the same time I (We) hereby appoint RAMIRO CASTRO DUQUE and/or JUAN PABLO CADENA SARMIENTO and/or BEATRIZ JARAMILLO S.

domiciled in Carrera 7 No. 16-56, Piso 9, my (our) attorney(s) in fact, with powers to receive notifications and to designate judicial and extrajudicial attorneys.

Otorgado y firmado en

hoy de

Firma

Nombre

VICE PRESIDENT &
ASSOCIATE GENERAL COUNSEL
TRADEMARK

Granted and signed in New York, N.Y.

this OCT 29 2001 day of 2001

Signature

Name

CERTIFICADO NOTARIAL (SOCIEDAD)

NOTARIAL CERTIFICATE (CORPORATION)

Hoy de de
personalmente compareció ante mí

a quien conozco, y de quien me consta que firmó el anterior documento, debidamente juramentado declaró y dijo que él es

de

Sociedad legalmente constituida para un período de duración que aún no ha terminado; que el declarante está autorizado por dicha compañía para conferir este poder; que el sello estampado por él al pie de tal poder, en nombre y representación de la expresada compañía, es el sello oficial de ella; y que el objeto para el cual se confiere este instrumento está comprendido dentro del de la sociedad.

El suscrito Notario hace constar que tuvo a la vista las pruebas de la existencia de la sociedad.

Estado de
con fecha

y que quien confiere el presente poder es su representante.

On this OCT 29 2001 day of of
personally appeared before me

to me known, and known to me to be the person who signed the foregoing instrument who being by me duly sworn did depose and say that he (she) is the

VICE PRESIDENT &
ASSOCIATE GENERAL COUNSEL
TRADEMARK
COLGATE-PALMOLIVE COMPANY

Which is legally constituted for a term not yet expired, that deponent is authorized by said Company to confer this Power of Attorney; that the seal affixed hereunto by the deponent in the name and on behalf of said Corporation is the corporate seal thereof; and that the purpose for which this instrument is granted is included within the corporate purpose of company.

The undersigned Notary Public attests that he has seen the documents that prove the existence of the company.

State of Delaware
under date of May 13, 1997

and that he (she) who grants the present power of attorney is its Representative.

Notario Público (sello)

Notary Public (seal)

CERTIFICADO NOTARIAL
PERSONA NATURAL

COUNTY

ROSIE S. DIZON
Notary Public, State of New York
No. 31-4941117
Qualified in New York County
Commission Expires Aug. 15, 2002

Hoy de de , compareció(eron)
ante mí

a quien (es) conozco y me consta que es(son) la(s) persona(s) firmante(s) del documento que precede y quien(es) declara(n) que otorgan el mismo para los fines y propósitos que en él se expresan.

On this OCT 29 2001 day of of
personally appeared before me

who is/are known to me and who I attest executed the foregoing document and he (they) declare(s) he (they) grant(s) the document for the purposes herein expressed.

Notario Público (sello)

Notary Public (seal)

LEGALIZACION POR APOSTILLA ES REQUERIDA.

LEGALIZATION BY

ROSIE S. DIZON
Notary Public, State of New York
No. 31-4941117
Qualified in New York County
Commission Expires Aug. 15, 2002

169 165

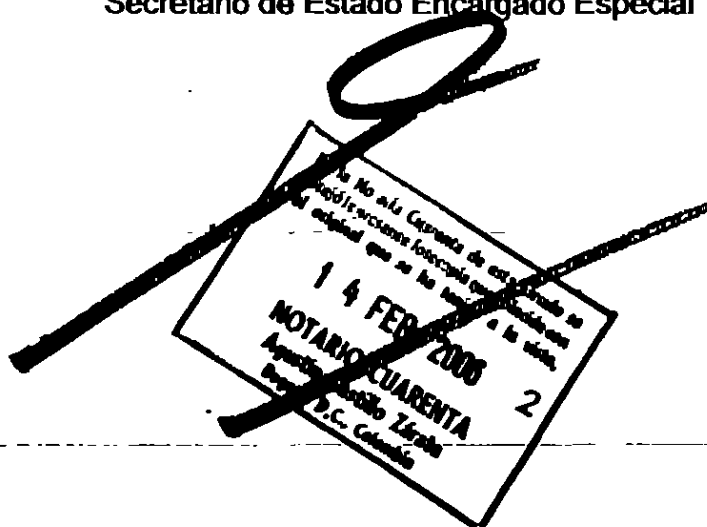
APOSTILLE

(Convención de La Haya del 5 de Octubre de 1961)

1. País: ESTADOS UNIDOS DE AMERICA
Este documento público
2. ha sido firmado por **Norman Goodman**
3. actuando en capacidad de **Oficial del Condado**
4. lleva el sello/timbre del condado de **New York**

CERTIFICADO

5. en New York, New York
6. el 30 de Octubre de 2001
7. por Secretario de Estado Encargado Especial, Estado de New York
8. No. NYC-9786540B
9. Sello/Timbre
10. Firma
(Firma)
Aquil M. Qureshi
Secretario de Estado Encargado Especial



170 166

TRADUCCIÓN SIMPLE AL ESPAÑOL del Certificado Notarial y el la apostilla que vienen
junto con el poder dado por Colgate-Palmolive Company, a Delaware Corporation,
domiciliada en 300 Park Avenue, New York, New York, Estados Unidos de América a
Ramiro Castro Duque y/o Juan Pablo Cadena Samiento y/o Beatriz Jaramillo S.
domiciliados en la Carrera 7 # 16-56 P. 9, Bogotá.

Certificado Notarial

Estado de New York)
) ss.
Condado de New York)

252373

Yo, NORMAN GOODMAN, Oficial del Condado y Oficial de la Corte
Suprema del Estado de New York, en y para el Condado de New York, un Tribunal
de Registros, que tiene un sello por ley.

CERTIFICO POR MEDIO DE LA PRESENTE de acuerdo con la Ley
Ejecutiva del Estado de New York, que

Rosie S. Dizon

cuyo nombre está suscrito al acta notarial, deposición, certificado de
reconocimiento o prueba, era al momento de tomar el mismo NOTARIO PÚBLICO
en y para el Estado de New York debidamente comisionado, juramentado y
calificado para actuar como tal; que de acuerdo con la ley, una comisión o un
certificado de este carácter oficial, con su firma autógrafa ha sido presentada en
mi oficina; que al momento de tomar tal prueba, reconocimiento o juramento,
estaba debidamente autorizado para tomar el mismo; que estoy bien familiarizado
con la escritura de tal NOTARIO PÚBLICO o he comparado la firma en el
instrumento anexo con la firma autógrafa depositada en mi oficina, y creo que tal
firma es genuina.

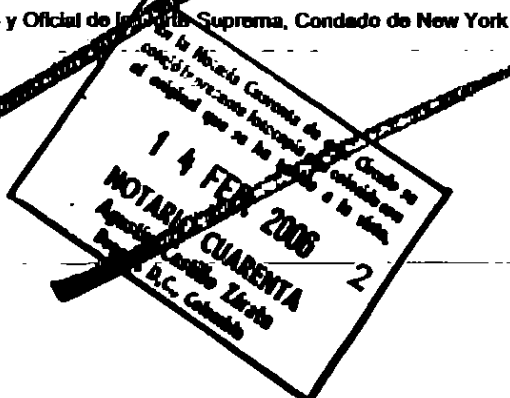
COMO TESTIGO DE LO MISMO, he fijado al presente mi firma t mi sello
oficial este

30 de Octubre de 2001

TARIFA PAGADA \$3.00

(Firma)

Oficial del Condado y Oficial de la Corte Suprema, Condado de New York





GAVILAN

167

ORGANIZACION ELECTORAL
REGISTRADURIA NACIONAL DEL ESTADO CIVIL

REGISTRO CIVIL DE DEFUNCION

Indicativo
Serial

5562241

Datos de la oficina de registro							
Clase de oficina:	Registraduría	Notaría	☒	Consulado	Corregimiento	Insp. de Policía	Código
							9795
País: COLOMBIA CUNDINAMARCA BOGOTA D.C. NOTARIA 32.							

Datos del inscrito	
Apellidos y nombres completos	
CASTRO DUQUE RAMIRO	
Documento de identificación (Clase y número)	Sexo (en Letras)
C.C. No. 170322 DE BOGOTA	MASCULINO

Datos de la defunción			
Lugar de la Defunción: País - Departamento - Municipio - Corregimiento o Inspección de Policía			
COLOMBIA CUNDINAMARCA BOGOTA D.C.			
Fecha de la defunción		Hora	Número de certificado de defunción
Año	2 0 0 4	04:10 PM	A- 2094375.
Presunción de muerte		Fecha de la sentencia	
Juzgado que profiere la sentencia		Año Mes Día	
Documento presentado		Nombre y cargo del funcionario	
Autorización judicial	☐	Certificado Médico	☒
		ANDRES DIAZ CAMPOS.- R.M. No. 79982662	

Datos del denunciante	
Apellidos y nombres completos	
EDGAR DAVID REGINO II.	
Documento de identificación (Clase y número)	Firma
C.C. No. 15.030.154 DE LORICA/ CORDOBA	

Primer testigo	
Apellidos y nombres completos	
Documento de identificación (Clase y número)	
Firma	

Segundo testigo	
Apellidos y nombres completos	
Documento de identificación (Clase y número)	
Firma	

Fecha de inscripción		Nombre y cargo del funcionario que inscribe	
Año	2 0 0 4	BLANCA ESTREPO	
Mez	1	NOTARIA	
Día	0 2		

PADRES: ALFONSO CASTRO		ESPACIO PARA NOTAS	
MERCEDES DUQUE.			

ORIGINAL PARA LA OFICINA DE REGISTRO

NOTARIA 32

DEL CIRCULO DE SANTA FE DE BOGOTA, D.C.

Germán Eleázar Moreno L.
Notario

COMO SECRETARIO DELEGADO DE LA NOTARIA TREINTA Y DOS (32) DEL
CIRCULO DE BOGOTA

CERTIFICO QUE:

La presente acta es fiel copia del original tomada del registro
civil de defunciones serial indicativo número: **ST 62281**
que expido en la ciudad de Bogotá D.C. hoy: **15 NOV. 2004**

NOTARIA 32 DEL CIRCULO
DE BOGOTA D.C.
SECRETARIO DELEGADO
NELSON FLORES C.
SECRETARIO DELEGADO PARA COPIAS
DECRETO 1334 DE 1989



Industria y Comercio

SUPERINTENDENCIA

Delegatura de Propiedad Industrial
División de Nuevas Creaciones

REQUISITOS NECESARIOS PARA PRESENTACIÓN Y AGILIZACIÓN DEL TRAMITE

PATENTE DE INVENCION ()	MODELO DE UTILIDAD ()	USUARIO ()	RADICADOR ()
-Indicación de que se solicita la concesión de una patente.			
-Datos de identificación del solicitante o de la persona que se presenta la solicitud.			
-Descripción de la invención.			
-Dibujos de ser estos pertinentes.			
-Comprobante de Pago de las tasas establecidas.			
COMPLETA ()	INCOMPLETA ()	()	()
DISEÑO INDUSTRIAL ()			
-Indicación de que se solicita el registro de Diseño Industrial.			
-Datos de identificación del solicitante o de la persona que se presenta la solicitud.			
-Representación gráfica y fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.			
-Comprobante de Pago de las tasas establecidas.			
COMPLETA ()	INCOMPLETA ()	()	()
ESQUEMA DE TRAZADO ()			
-Indicación de que se solicita el registro de Diseño Industrial.			
-Datos de identificación del solicitante o de la persona que se presenta la solicitud.			
-Representación gráfica del Esquema Trazado.			
-Comprobante de Pago de las tasas establecidas.			
COMPLETA ()	INCOMPLETA ()	()	()

Firma Responsable:

Fecha:

Z. Morz / 60

SUPERINDUSTRIA Y COMERCIO
Radicación : 66820975 66869000
Fecha (AKD): 2006-03-02 15:55:48
Trámite : 811 PCI-PATENT 378 FASE KACI 411 PRESENTAC
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

Folios: 171

172

168

REPUBLICA DE COLOMBIA
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

169
Folio 173

2020
Bogotá D.C.,

Doctor(a)
CADENA SARMIENTO JUAN PABLO
Apoderado(a) y/o Representante de
COLGATE PALMOLIVE COMPANY

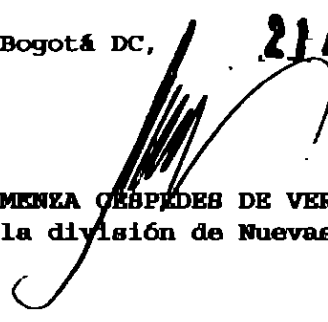
REFERENCIA	Radicación No.	06 20975
	Solicitud internacional	UB2004/026421
	Fecha inicio fase nacional	15/03/2006
	Trámite	11
	Evento	378
	Actuación	416
	Oficio No.	394
	Folios	1

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en la Decisión 486 de la Comisión de la Comunidad Andina, el Tratado de Cooperación en Materia de Patentes (PCT), el Reglamento y la Circular Única de la Superintendencia de Industria y Comercio, se envía el extracto de la solicitud a la Oficina de Comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial.

Cúmplase

Dado en Bogotá DC,

21 ABR 2006


ALIX CARMONA OSPINA DE VERGEL
Jefe de la división de Nuevas Creaciones

jramos