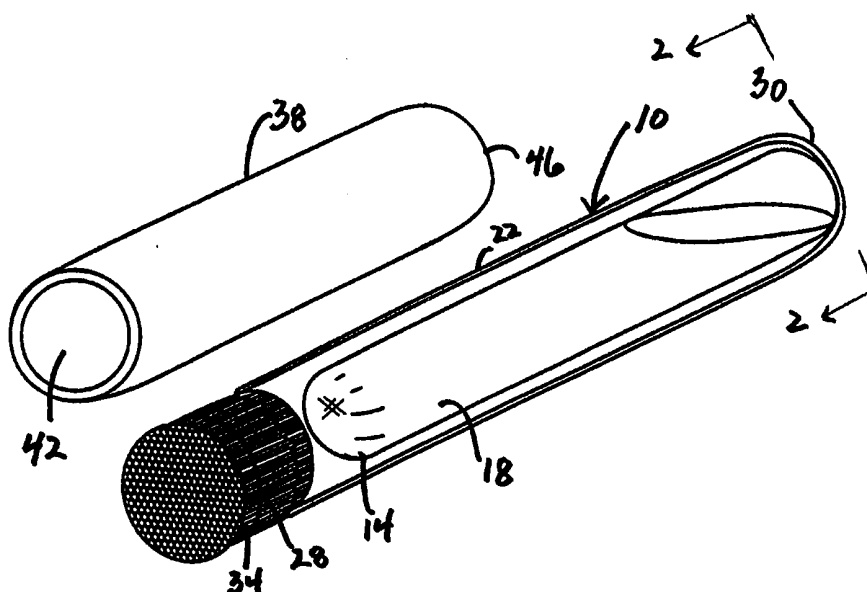




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(21) International Application Number: PCT/US97/13570 (22) International Filing Date: 31 July 1997 (31.07.97) (71)(72) Applicant and Inventor: ANDERSON, Michael, R. [US/US]; 1424 Stone Trail, Enterprise, FL 32725 (US). (74) Agent: PAVITT, William, H., Jr.; Beehler & Pavitt, Suite 330, 100 Corporate Pointe, Culver City, CA 90230 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>With amended claims and statement.</i>

(54) Title: TOOTH WHITENING SYSTEM



(57) Abstract

The invention includes a tooth whitening elongated member and method for using the member along with other apparatus and compounds. The member comprises a hermetically sealed frangible container holding a tooth whitening solution. The frangible container is enclosed in a flexible vial with a closed end and an open end. The open end of the vial contains wicking applicator material. A safety sleeve may be provided. The applicator material is applied to the teeth to whiten them. The teeth are then rinsed. The next step in the whitening process involves applying a polishing compound using a portable hand-held polishing machine which includes a rotary polishing tip. After polishing is completed, the polishing tip is removed from the polishing machine and cleaned with water. The polishing machine is then dried and the polishing tip reinstalled. The whitening solution, polishing compound, and rinsing solution may include stabilized oxygen and colostrum.

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TOOTH WHITENING SYSTEM

Related Applications

This application includes the use of novel compounds, the details of which are
5 fully described in pending application Serial No. 08/863,419, the contents of which
are herein specifically incorporated by reference.

Field of Invention

10

The invention applies to the field of dental care; more particularly to systems
and devices designed to enhance the whiteness and reflective quality of human teeth.

Background of the Invention

15

It has long been recognized that tooth color is a significant factor in facial
appearance. The common perception is that a whiter or brighter tooth color enhances
the effect of smiling and generally leads to a more attractive appearance. Periodic
professional dental cleaning and polishing has been routinely used to enhance the
whiteness of teeth. This process, while effective, is far too costly and time consuming
20 to be used on a regular basis.

Other methods used to enhance tooth whiteness include replacing outer tooth
surfaces with crowns or veneers. While such procedures enhance tooth whiteness
substantially, they are extremely expensive and tend to be more prone to breakage
than unsurfaced teeth. Teeth have also been bleached to improve whiteness.

25

Bleaching systems are provided by dentists and are available for home use as well.

While bleaching systems are also effective, they involve the oral use of strong chemicals which may have toxic side effects.

What is needed is a tooth whitening system which is safe, effective, convenient and low cost. To date, none of the prior art inventions have achieved all of these
5 objectives.

Summary of the Invention

The present invention addresses all of the desired features for a tooth whitening system identified as lacking in any single invention of the prior art. The
10 invention adapts some of the mechanical technology long employed by dentists to provide safe and effective tooth whitening. At the same time the invention avoids the use of strong chemicals while providing an easy to use, low cost system which can be used in any convenient location.

The present invention includes a novel tooth whitening elongated member and
15 methods for using the tooth whitening elongated member and other apparatus and compounds. The tooth whitening elongated member can be constructed from five components. These components include a frangible, hermetically sealed container, a tooth whitening solution disposed within the container and a flexible vial having an open first end and a closed second end. The frangible container is located inside of
20 the vial which has wicking applicator material in the open first end of the vial and extending axially out of the vial. When the vial is held with the applicator material positioned below the closed end of the vial and the vial is squeezed to rupture the

container the solution flows into the applicator material in the first end of the vial and the applicator material may be applied to a person's teeth to whiten them.

In a variant of the invention a safety sleeve is provided having an open first end and a closed second end is sized to fit closely and slidably over the vial. When the first end of the vial is removably placed in the sleeve in a first position the applicator material is adjacent the closed second end of the sleeve. When the vial is placed in the safety sleeve in a second position the applicator material and the open first end extend axially outward from the safety sleeve, thereby further protecting a person's fingers while rupturing the container.

In another variant of the present invention the frangible, hermetically closed container is in the form of a glass ampoule. In yet another variant, the vial is in the form of a flexible tube with an open first end and a closed second end. In yet another variant the tooth whitening solution comprises a solution of colostrum, hydrogen peroxide, water with stabilized oxygen, flavoring, sodium saccharin and Poloxmer 407.

The method for whitening teeth includes the use of the tooth whitening elongated member as described above and a series of other steps. First, the tooth whitening elongated member is positioned so that the applicator material extends below the closed second end of the vial and sufficient pressure is applied to the vial so that the frangible container is broken and the whitening solution is released and flows downward into the applicator material. After waiting until the whitening solution to saturate the applicator material the applicator material is rubbed on the teeth to apply

the whitening solution to them. Next the teeth are rinsed and the polishing phase of the method is begun.

In a variant of the invention the teeth are rinsed with a solution comprising hydrogen peroxide; water; polysorbate 20; xylitol; flaror; acesulfame K; polaxamer
5 407; sodium benzoate; potassium sorbitol; PPG26 Buteth 26/Peg 40; hydrogenated castorn oil; stabilized oxygen; and colostrum.

In another variant of the invention the tooth whitening elongated member is provided with the vial placed in the safety sleeve in a first position. Next, the sleeve is removed from the vial and the vial squeezed to rupture the container. In another
10 variant of the method of the present invention the vial is placed into the sleeve in a second position so that the applicator material and the open first end of the vial extend axially outward from the safety sleeve so that the fingers of the user are further protected when the container is ruptured..

A polishing machine is provided which includes a mandrel; a means of
15 providing torque to the mandrel; a power supply for the means; a handle for positioning the mandrel; and a switch for controlling the means. A deformable polishing tip frictionally fitted to the mandrel is provided along with tooth polishing compound. The polishing compound is applied to the polishing tip. The polishing tip is applied to teeth while closing the switch and moving the polishing tip back and
20 forth gently over teeth. Polishing compound is reapplied to the polishing tip as required. Next the teeth are rinsed.

As maintenance for the polishing machine and polishing tip, the polishing tip is next removed from the polishing machine and the polishing tip is washed with water.

The mandrel of the polishing machine is then dried and the polishing tip is replaced on the mandrel.

As a variant on the method of the present invention the tooth polishing compound may be provided in individual application packages. These individual
5 packages are broken open and squeezed to eject the polishing compound.

As a further variant, the method may be practiced by providing a polishing compound comprising water; sodium lauryl sulfate; pumice; Carbomer Ultra; Polysorbate 20; T.E.A.; sodium saccharin; flavoring; sodium benzoate; calcium disodium EDTA; stabilized oxygen; and colostrum.
10

Brief Description of the Drawings

Figure 1 is a perspective side view of the tooth whitening elongated member
15 with the safety sleeve removed;

Figure 2 is a cross-sectional side view of the **Figure 1** embodiment taken along the line 2-2;

Figure 3 is a cross-sectional side view of the **Figure 1** embodiment showing the frangible container after squeezing taken along the line 2-2;

20 **Figure 4** is a side view of the polishing machine with the polishing tip removed;

Figure 5 is a side perspective view of the polishing tip; and

Figure 6 is a plan view of the individual application packages of the polishing compound.

Detailed Description of the Preferred Embodiment

5 **Figures 1, 2 and 3** illustrate the tooth whitening elongated member **10** which can be constructed from five components. These components include a frangible, hermetically sealed container **14**, a tooth whitening solution disposed within the container **18** and a flexible vial **22** having an open first end **26** and a closed second end **30**. The frangible container **18** is located inside of the vial **22** which has wicking
10 applicator material **34** in the open first end **26** of the vial **22** and extending axially out of the vial **22**. A safety sleeve **38** having an open first end **42** and a closed second end **46** is sized to fit closely and slidably over the vial **22**.

When the first end **26** of the vial **22** is removably placed in the sleeve **38** in a first position the applicator material **34** is adjacent the closed second end **46** of the
15 sleeve **38**. When the vial **22** is withdrawn from the sleeve **38** with the applicator material **34** being held below the closed end **30** of the vial **22** and the vial **22** is squeezed to rupture the container **14** the solution **18** flows into the applicator material **34** in the first end **26** of the vial **22** and the applicator material **34** may be applied to a person's teeth to whiten them.

20 When the vial **22** is placed in the safety sleeve **38** in a second position the applicator material **34** and the open first end **26** extend axially outward from the sleeve **38**, thereby further protecting a person's fingers while rupturing the container **14**.

In a variant of the present invention the frangible, hermetically closed container 14 is in the form of a glass ampoule. In another variant, the vial 22 is in the form of a flexible tube with an open first end 26 and a closed second end 30. In yet another variant the tooth whitening solution 18 comprises a solution of hydrogen peroxide; water with stabilized oxygen; flavoring; sodium saccharin; Poloxmer 407; and colostrum.

The method for whitening teeth includes the use of the tooth whitening elongated member 10 as described above and a series of other steps. First, the tooth whitening elongated member 10 is provided with the vial 22 placed in the safety sleeve 38 in a first position. Next, the sleeve 38 is removed from the vial 22. In a variant of the method of the present invention the vial 22 is placed into the sleeve 38 in a second position so that the applicator material 34 and the open first end 26 of the vial 22 extend axially outward from the sleeve 38.

The tooth whitening elongated member 10 is positioned so that the applicator material 34 extends below the closed second end 30 of the vial 22 and sufficient pressure is applied to the vial 22 so that the frangible container 14 is broken and the whitening solution 18 is released and flows downward into the applicator material 34 (See Figure 3). After waiting until the whitening solution 18 becomes visible on the applicator material 34, the applicator material 34 is rubbed on the teeth to apply the whitening solution 18 to them. Next the teeth are rinsed with a solution comprising hydrogen peroxide; water; polysorbate20; xylitol; flaror; acesulfame K; polaxamer 407; sodium benzoate; potassium sorbitol; PPG26 Buteth 26/Peg 40; hydrogenated castorn oil; stabilized oxygen; and colostrum.

Next, the polishing phase of the method is begun.

Figure 4 illustrates a polishing machine **50** which includes a mandrel **54**; a means **58** of providing torque to the mandrel **54**; a power supply **62** for the means; a handle **66** for positioning the mandrel **54**; and a switch **70** for controlling the means

5 **58**. A deformable polishing tip **74** frictionally fitted to the mandrel **54** is provided along with tooth polishing compound **78**. The polishing compound **78** is applied to the polishing tip **74**. The polishing tip **74**, which is further illustrated in **Figure 5**, is applied to teeth while closing the switch **70** and moving the polishing tip **74** back and forth gently over teeth. Polishing compound **78** is reapplied to the polishing tip **74** as

10 required. Next the teeth are rinsed with a a solution comprising hydrogen peroxide; water; polysorbate 20; xylitol; flaror; acesulfame K; polaxamer 407; sodium benzoate; potassium sorbitol; PPG26 Buteth 26/Peg 40; hydrogenated castorn oil; stabilized oxygen; and colostrum.

As maintenance for the polishing machine **50** and polishing tip **74**, the

15 polishing tip **74** is next removed from the polishing machine **50** and the polishing tip **74** is washed with water. The mandrel **54** of the polishing machine **50** is then dried and the polishing tip **74** is replaced on the mandrel **54**.

Figure 6 illustrates a variant on the method of the present invention in which the tooth polishing compound **78** may be provided in individual application packages

20 **82**. These individual packages **82** are broken open and squeezed to eject the polishing compound **78**.

As a further variant, the method may be practiced by providing a polishing compound **78** comprising water; sodium lauryl sulfate; pumice; Carbomer Ultra; Polysorbate 20; T.E.A.; sodium saccharin; flavoring; sodium benzoate; calcium

disodium EDTA; stabilized oxygen; and colostrum.

CLAIMS

1. A tooth whitening elongated member comprising:
 - a frangible, hermetically closed container;
 - 5 a tooth whitening solution disposed within said container;
 - an elongated flexible vial having an open first end and a closed second end;
 - said container being disposed within said vial; and
 - wicking applicator material disposed within said open first end of said
 - 10 vial and extending axially out from said first end.

2. A tooth whitening elongated member as described in Claim 1, further comprising:
 - a safety sleeve having an open first end and a closed second end;
 - 15 said sleeve being sized to fit closely and slidably over said vial; and
 - said vial being removably disposed within said sleeve in a first position whereby the first end of the vial is inserted in the sleeve with its applicator material adjacent the closed end of the sleeve; and when the vial is withdrawn from the sleeve with the applicator material being disposed below the closed
 - 20 end of the vial, and the vial is squeezed the container is ruptured to permit the solution to flow into the applicator material in the first end of the vial for application to a person's teeth to whiten them.

3. A tooth whitening elongated member as described in Claim 1, wherein said vial is disposed within said sleeve in a second position so that said applicator and said open first end extend axially outward from said sleeve, thereby further protecting a person's fingers while rupturing the container.

5

4. A tooth whitening elongated member as described in Claim 1 wherein said frangible, hermetically closed container is in the form of a glass ampoule.

5. A tooth whitening elongated member as described in Claim 1 wherein said vial
10 is in the form of a flexible tube with an open first end and a closed second end.

6. A tooth whitening elongated member as described in Claim 1 wherein said tooth whitening solution comprises a solution of hydrogen peroxide; water with stabilized oxygen; flavoring; sodium saccharin; poloxmer 407; and colostrum.

15

7. A method for whitening teeth comprising the following steps:

providing a tooth whitening elongated member as described in Claim 1;

holding said tooth whitening elongated member so that said applicator material extends below said closed second end of said vial;

20 applying sufficient pressure to said vial so that said frangible container is broken and said whitening solution is released and flows downward into said applicator material;

waiting until said whitening solution has saturated said applicator material;

rubbing said applicator material on teeth to apply said whitening solution thereto; and

5 rinsing teeth.

8. The method for whitening teeth as described in Claim 7 wherein the teeth are rinsed with a solution comprising hydrogen peroxide; water; Polysorbate20; xylitol; flaror; Acesulfame K; polaxamer 407; sodium benzoate; potassium sorbitol; PPG26
10 Buteth 26/Peg 40; hydrogenated castorn oil; stabilized oxygen; and colostrum.

9. The method for whitening teeth as described in Claim 7, further comprising the following step:

providing said safety sleeve with said vial being disposed within said
15 sleeve in said first position;
sliding said sleeve off of said vial;
placing said vial into said sleeve in said second position so that said applicator material and said open first end of said vial extend axially outward from said sleeve, thereby further protecting a person's fingers while rupturing
20 the container.

10. A method for whitening teeth as described in Claim 7, further comprising the following steps:

providing a polishing machine;
said polishing machine including a mandrel; a means of providing
torque to said mandrel; a power supply for said means; a handle for
positioning said mandrel; and a switch for controlling said means;
5 providing a deformable polishing tip frictionally fitted to said mandrel;
providing tooth polishing compound;
applying said polishing compound to said polishing tip;
applying said polishing tip to teeth while closing said switch;
moving said polishing tip back and forth gently over teeth;
10 reapplying said polishing compound to said polishing tip as required;
and
rinsing teeth.

11. The method for whitening teeth as described in Claim 10 wherein the teeth are
15 rinsed with a solution comprising hydrogen peroxide; water; Polysorbate20; xylitol;
flavor; Acesulfame K; polaxamer 407; sodium benzoate; potassium sorbitol; PPG26
Buteth 26/Peg 40; hydrogenated castor oil; stabilized oxygen; and colostrum.

20 12. A method for whitening teeth as described in Claim 10, further comprising the
following steps:

removing said polishing tip from said polishing machine;
washing said polishing tip with water;

drying said mandrel of said polishing machine; and
replacing said polishing tip on said mandrel.

13. The method for whitening teeth as described in Claim 10, further comprising
5 the following steps:

providing said tooth polishing compound in individual application
packages;
breaking open one of said application packages; and
squeezing said application package to eject said polishing compound.

10

14. The method for whitening teeth as described in Claim 10, further comprising
the following step:

providing a polishing compound comprising water; sodium lauryl
sulfate; pumice; "Carbomer Ultra" (carbomer); polysorbate 20; "T.E.A."
15 (triethanolamine); sodium saccharin; flavoring; sodium benzoate; calcium
disodium EDTA; stabilized oxygen; and colostrum.

AMENDED CLAIMS

[received by the International Bureau on 15 September 1998 (15.09.98);
original claims 1, 2, 7 and 9 replaced by new claims 1 and 7; remaining claims unchanged
(5 pages)]

1. A tooth whitening elongated member comprising:

a frangible, hermetically closed container;

- 5 a tooth whitening solution disposed within said container;

an elongated flexible vial having an open first end and a closed
second end;

said container being disposed within said vial;

wicking applicator material disposed within said open first end of said

- 10 vial and extending axially out from said first end;

a safety sleeve having an open first end and a closed second end;

said sleeve being sized to fit closely and slidably over said vial; and

said vial being removably disposed within said sleeve in a first

position whereby the first end of the vial is inserted in the

- 15 sleeve with its applicator material adjacent the closed end of

the sleeve; and when the vial is withdrawn from the sleeve

with the applicator material being disposed below the closed

end of the vial, and the vial is squeezed the container is

ruptured to permit the solution to flow into the applicator

- 20 material in the first end of the vial for application to a person's

teeth to whiten them.

3. A tooth whitening elongated member as described in Claim 1, wherein said

vial is disposed within said sleeve in a second position so that said applicator

and said open first end extend axially outward from said sleeve, thereby further protecting a person's fingers while rupturing the container.

4. A tooth whitening elongated member as described in Claim 1 wherein said
5 frangible, hermetically closed container is in the form of a glass ampoule.

5. A tooth whitening elongated member as described in Claim 1 wherein said
vial is in the form of a flexible tube with an open first end and a closed
second end.

10

6. A tooth whitening elongated member as described in Claim 1 wherein said
tooth whitening solution comprises a solution of hydrogen peroxide; water
with stabilized oxygen; flavoring; sodium saccharin; poloxmer 407; and
colostrum.

15

7. A method for whitening teeth comprising the following steps:
providing a tooth whitening elongated member as described in Claim
1;
providing a safety sleeve with said vial being disposed within said
20 sleeve in said first position;
sliding said sleeve off of said vial;
placing said vial into said sleeve in said second position so that said
applicator material and said open first end of said vial extend

axially outward from said sleeve, thereby further protecting a person's fingers while rupturing the container.

holding said tooth whitening elongated member so that said applicator material extends below said closed second end of said vial;

5 applying sufficient pressure to said vial so that said frangible container is broken and said whitening solution is released and flows downward into said applicator material;

waiting until said whitening solution has saturated said applicator material;

10 rubbing said applicator material on teeth to apply said whitening solution thereto; and
rinsing teeth.

8. The method for whitening teeth as described in Claim 7 wherein the teeth are
15 rinsed with a solution comprising hydrogen peroxide; water; Polysorbate20; xylitol; flaror; Acesulfame K; polaxamer 407; sodium benzoate; potassium sorbitol; PPG26 Buteth 26/Peg 40; hydrogenated castorn oil; stabilized oxygen; and colostrum.

20 10. A method for whitening teeth as described in Claim 7, further comprising the following steps:
providing a polishing machine;

said polishing machine including a mandrel; a means of providing torque to said mandrel; a power supply for said means; a handle for positioning said mandrel; and a switch for controlling said means;

5 providing a deformable polishing tip frictionally fitted to said mandrel;

providing tooth polishing compound;

applying said polishing compound to said polishing tip;

applying said polishing tip to teeth while closing said switch;

10 moving said polishing tip back and forth gently over teeth;

reapplying said polishing compound to said polishing tip as required;

and

rinsing teeth.

15 11. The method for whitening teeth as described in Claim 10 wherein the teeth are rinsed with a solution comprising hydrogen peroxide; water; Polysorbate20; xylitol; flaror; Acesulfame K; polaxamer 407; sodium benzoate; potassium sorbitol; PPG26 Buteth 26/Peg 40; hydrogenated castorn oil; stabilized oxygen; and colostrum.

20

12. A method for whitening teeth as described in Claim 10, further comprising the following steps:

removing said polishing tip from said polishing machine;

washing said polishing tip with water;
drying said mandrel of said polishing machine; and
replacing said polishing tip on said mandrel.

- 5 13. The method for whitening teeth as described in Claim 10, further comprising
the following steps:

providing said tooth polishing compound in individual application
packages;

breaking open one of said application packages; and

- 10 squeezing said application package to eject said polishing compound.

14. The method for whitening teeth as described in Claim 10, further comprising
the following step:

providing a polishing compound comprising water; sodium lauryl

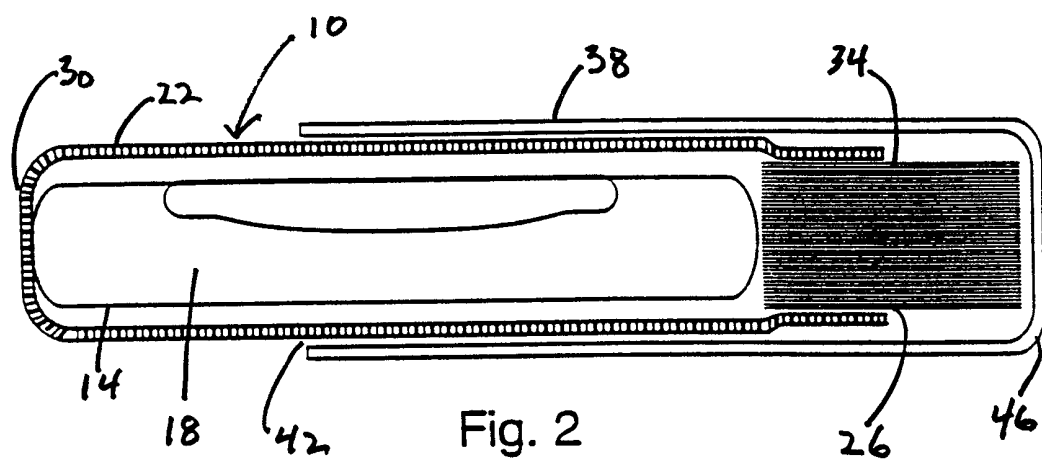
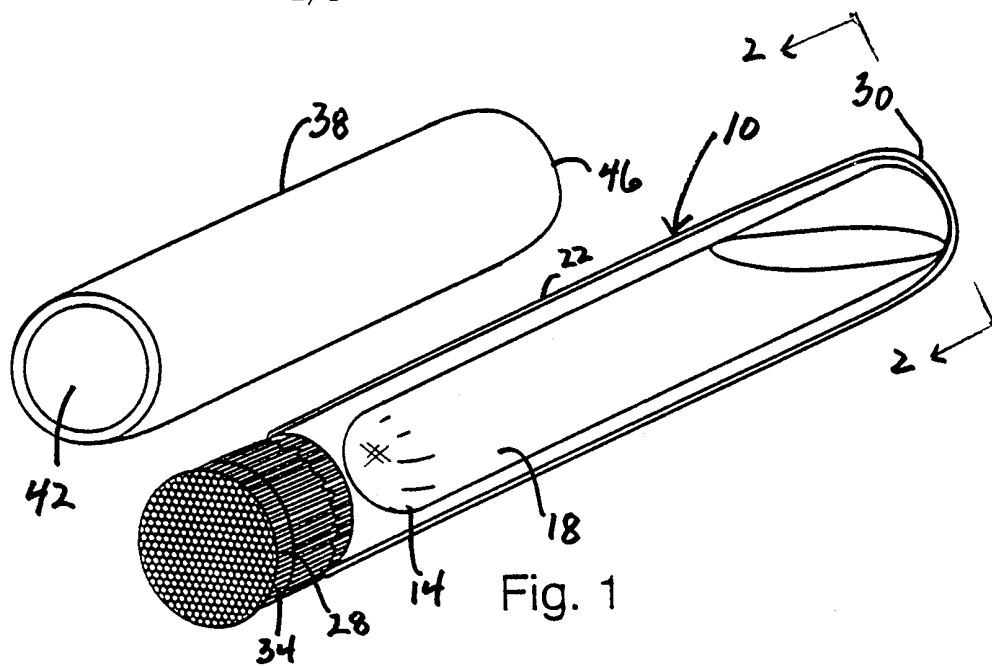
- 15 sulfate; pumice; "Carbomer Ultra" (carbomer); polysorbate 20;
"T.E.A." (triethanolamine); sodium saccharin; flavoring;
sodium benzoate; calcium disodium EDTA; stabilized oxygen;
and colostrum.

STATEMENT UNDER ARTICLE 19

Claims 1 and 2 have been combined into amended claim 1. This combination adds the element of a safety sleeve to the elongated flexible vial of the tooth whitening elongated member. Thus the present invention may be distinguished over the disposable applicator for nail polish or other liquid disclosed in *Chernack* (PCT/US84/00363) and cited by the Authorized Officer as relevant to claims 1, 2, 4, 5 and 7. Likewise, claims 7 and 9 have been combined into amended claim 7 to include the method of utilizing the safety sleeve with the tooth whitening elongated member. As claims 4 and 5 now depend from amended claim 1, the Authorized Officer's assertion of relevance should now be obviated.

As *Wagner* (U.S. Patent No. 5,611,687) cited by the Authorized Officer as relevant to claims 1, 2, 4, 5 and 7 includes "means for drawing the oral hygiene preparation to the applicator tip by capillary action." (claim 1, lines 44-46), and as this element is missing from the present invention, Applicant feels that no amendment is necessary to avoid *Wagner*.

1/3



2/3

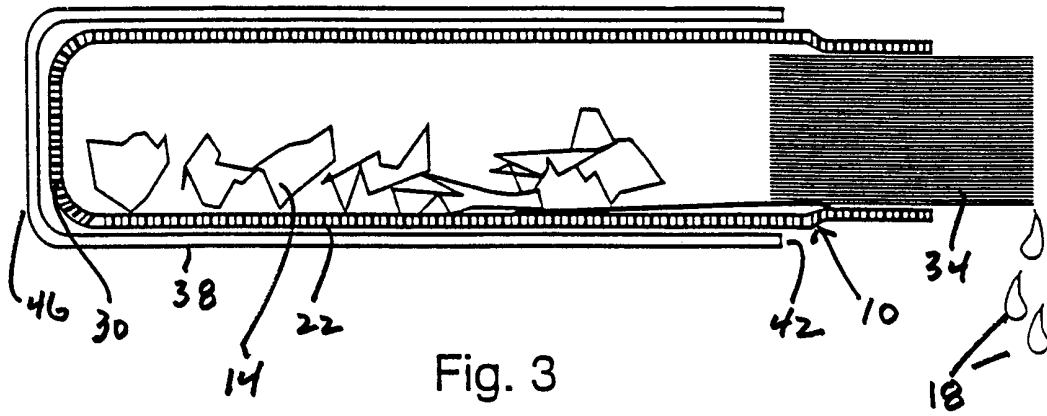


Fig. 3

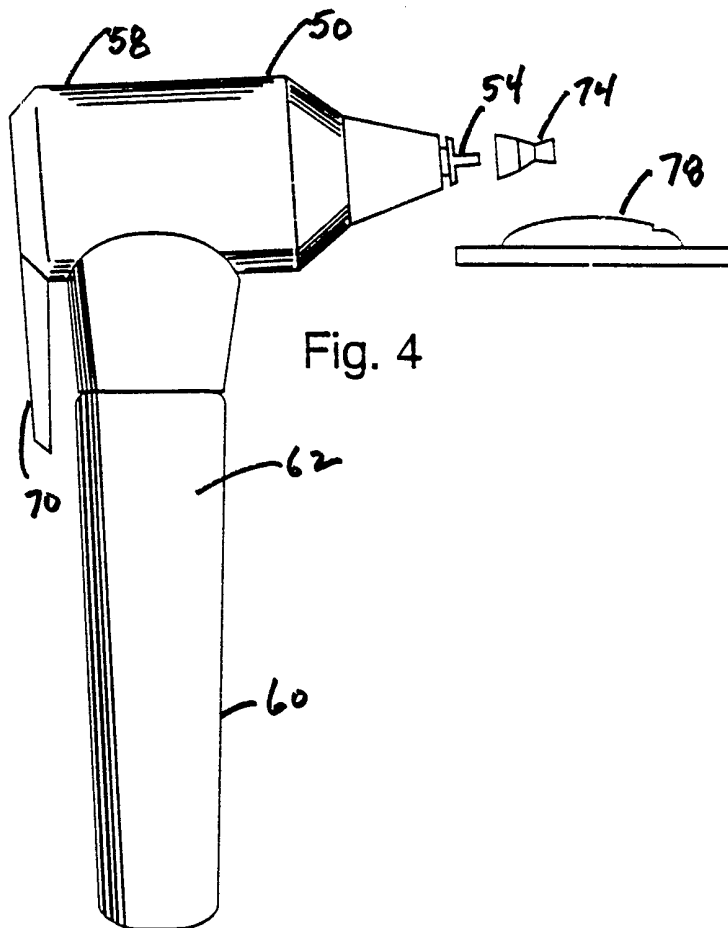


Fig. 4

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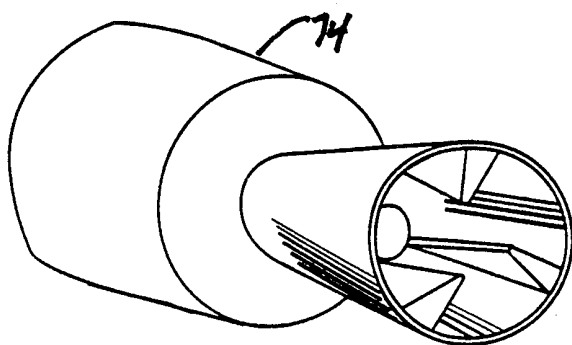


Fig. 5

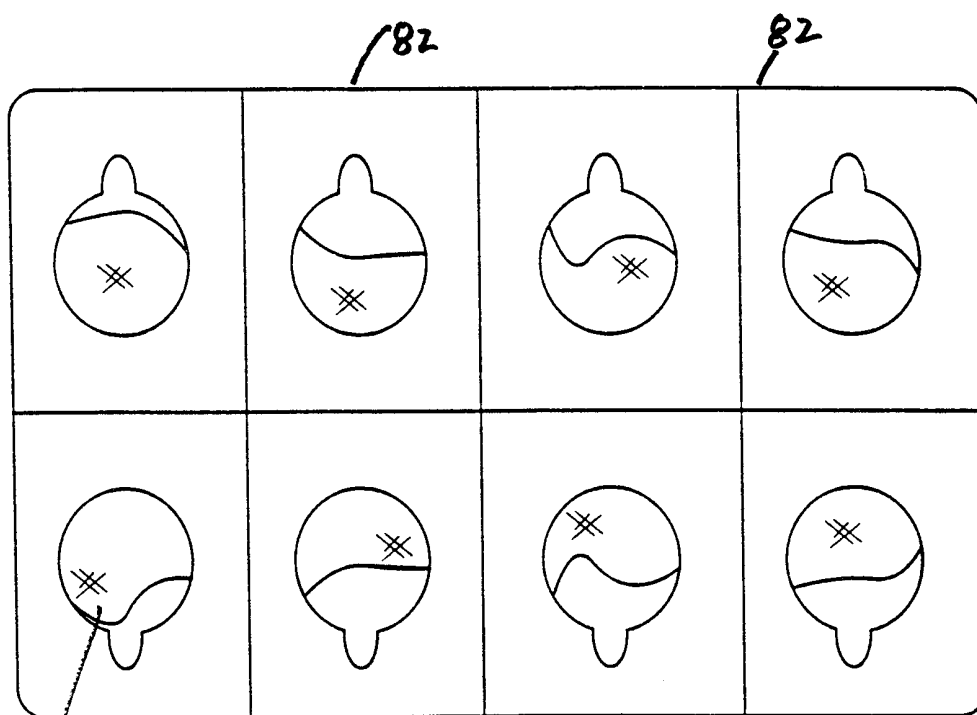


Fig. 6

INTERNATIONAL SEARCH REPORT

Inventor's National Application No

PCT/US 97/13570

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61C19/06 A61C5/00 A61K6/00

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 6 A61C A61K A61B A46B

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 611 687 A (WAGNER) 18 March 1997	1,2,4,5,7
A	see the whole document ---	6
Y	WO 84 03862 A (CHERNACK) 11 October 1984	1,2,4,5,7
	see the whole document ---	
A	US 5 208 010 A (THALER) 4 May 1993	6,8,11
	see the whole document ---	
A	WO 97 04742 A (PROCTER & GAMBLE) 13 February 1997	8,11
	see claims 1,2 ---	
A	US 4 308 252 A (TOMAICH) 29 December 1981	10,14
	see claim 4 ---	
	-/--	

☒ 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

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 97/13570

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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