EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
27.05.2009 Bulletin 2009/22

(21) Application number: 03721532.4

(22) Date of filing: 04.04.2003

(51) Int Cl.:
A61Q 11/00(2006.01) A61K 8/02(2006.01)
A61K 8/18(2006.01)

(86) International application number:
PCT/US2003/010343

(87) International publication number:

(54) ORAL TREATMENT PRODUCTS, KITS AND METHODS
MUNDPFLEGENMITTEL, KITS UND METHODEN
PRODUITS DE TRAITEMENT BUCCAL, TROUSSES ET METHODES ASSOCIEES

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR

(30) Priority: 12.04.2002 GB 0208466

(43) Date of publication of application:
12.01.2005 Bulletin 2005/02

(73) Proprietor: THE PROCTER & GAMBLE COMPANY
Cincinnati, Ohio 45202 (US)

(72) Inventors:
• CASHMAN, Stuart, Reginald
  Twickenham, Middlesex TW1 4QT (GB)
• MONEUZE, Gaelle
  Surrey TW20 9JA (GB)
• MORTON, Jennifer Claire
  Berkshire SL6 2EJ (GB)
• YE, Hai
  Beijing 100084 (CN)

(74) Representative: Clemo, Nicholas Graham et al
Procter & Gamble Technical Centres Limited
Patent Department
Rusham Park
Whitehall Lane
Egham
Surrey TW20 9NW (GB)

(56) References cited:
WO-A-01/01940
DE-A- 4 322 572
WO-A-02/07636

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).
Description

Field of the Invention

[0001] The present invention relates to the packaging and use of oral treatment products comprising volatile solvents for film-forming polymers, particularly wherein the oral treatment products are tooth whitening products.

Background Of The Invention

[0002] There is a growing demand for people to be able to treat their own teeth, for example with tooth whitening products, beyond the traditional brushing with a cleansing product. An exemplary tooth whitening composition is disclosed in PCT application WO 01/01940.

[0003] The treatment fluid disclosed in the above-referenced PCT application is but one example of a number of useful fluid compositions which comprise a film-forming polymer dissolved or dispersed in a volatile solvent which can then be applied, e.g. by painting onto a surface to be treated. One of the problems posed by such fluids is the need to provide a convenient package that prevents the fluid from drying out yet is convenient to use when needed. The applicant has found that further substantial problems are presented by the incompatibility of many common packaging materials with the solvents used. Yet further difficulties are presented by the need to assist the user of such products in sustaining a treatment regimen over a period of several days in an effective and hygienic manner.

[0004] It is an object of the present invention, therefore, to provide unit dose treatment products wherein a volatile, film-forming liquid is provided in a convenient package having a prolonged shelf life. It is a further object of the present invention to provide kits containing several such products, together with multiple applicators for the liquid, in order to provide a user in need of such products with an easy to follow regimen which is not halted by clogged or dirty applicators.

[0005] These and other objectives will become readily apparent from the detailed description that follows.

Summary Of The Invention

[0006] The present invention provides a unit dose treatment product comprising:

a) a sealed disposable package comprising a laminate wherein the laminate comprises;

i) an aluminium barrier layer; and

ii) a polymer contact layer selected from polypropylene, polyimide and nylon 12;

b) a liquid treatment product contained within the package, wherein the liquid treatment product comprises:

i) a film-forming polymer;

ii) an organic solvent for the film-forming polymer having a boiling point of less than 150°C and a solubility parameter of less than 22 (MPa)^0.5; and

iii) an active agent;

wherein the polymer contact layer of the laminate is in contact with the liquid treatment product. Kits comprising the unit dose treatment products are also provided. The products and kits herein provide for convenient oral treatments, especially tooth whitening treatments using an extended regimen.

Detailed Description

[0007] The present invention provides a unit dose treatment product comprising a sealed disposable package and a liquid treatment product contained within the package.

[0008] Unless specified otherwise, all percentages and ratios herein are by weight and all measurements are made at 25°C.

[0009] The liquid treatment product comprises a film-forming polymer, a solvent for the polymer and an active agent which effects the desired treatment.
The term "film-forming polymer" herein means a polymer capable of forming, by itself alone or in the presence of a plasticizing agent, an isolable film. The film-forming polymer can be dissolved, or uniformly dispersed in the form of particles, in the solvent.

The film-forming polymer can include materials such as vinyl polymers; polyurethanes; polyesters; alkyd resins; epoxyster resins; cellulose polymers, such as cellulose esters; modified starches; various silicone materials such as polysiloxanes, silicone gums and resins; and their mixtures. Particularly preferred for use herein are organosiloxane resins.

Organosiloxane resins are highly crosslinked polymeric siloxane systems. The crosslinking is introduced through the incorporation of tri-functional and tetrafuctional silanes with mono-functional or di-functional, or both, silanes during manufacture of the silicone resin. As is well understood in the art, the degree of crosslinking that is required in order to result in a silicone resin will vary according to the specific silane units incorporated into the silicone resin. In general, silicone materials which have a sufficient level of trifunctional and tetrafuctional siloxane monomer units, and hence, a sufficient level of crosslinking, such that they dry down to a rigid, or hard, film are considered to be silicone resins. The ratio of oxygen atoms to silicon atoms is indicative of the level of crosslinking in a particular silicone material. Silicone materials which have at least about 1.1 oxygen atoms per silicon atom will generally be silicone resins herein. Preferably, the ratio of oxygen: silicon atoms is at least about 1.2: 1.0.

Silicone materials and silicone resins in particular can conveniently be identified according to a shorthand nomenclature system well known to those skilled in the art as the "MDTQ" nomenclature. Under this system, the silicone is described according to the presence of various siloxane monomer units which make up the silicone. Briefly, the symbol M denotes the mono-functional unit (CH₃)₃SiO; D denotes the difunctional unit (CH₃)₂SiO; T denotes the trifunctional unit (CH₃)₂SiO; and Q denotes the quadra- or tetra-functional unit SiO₂. Note that a small amount, up to about 5% of silanol or alkoxy functionality may also be present in the resin structure as a result of processing.

Primes of the unit symbols, e.g., M', D', T', and Q', denote substituents other than methyl, and must be specifically defined for each occurrence. Typical alternate substituents include groups such as vinyl, phenyl, amino, hydroxyl, etc.

The molar ratios of the various units, either in terms of subscripts to the symbols indicating the total number of each type of unit in the silicone, or an average thereof, or as specifically indicated ratios in combination with molecular weight, complete the description of the silicone material under the MDTQ system.

Higher relative molar amounts of T, Q, T'and/or Q'to D, D', M and/or M' in a silicone resin is indicative of higher levels of crosslinking. As discussed before, however, the overall level of crosslinking can also be indicated by the oxygen to silicon ratio.

The organosiloxane resins are solid at about 25°C and the average molecular weight of the resins is from about 1,000 to about 10,000. The resins are soluble in organic solvents such as toluene, xylene, isoparaffins, and cyclosiloxanes or the organic solvents described below, indicating that the resin is not sufficiently crosslinked such that the resin is insoluble in the solvent.

The silicone resins preferred for use herein are MQ, MT, MTQ, and MDTQ resins; such MQ resins are disclosed in U. S. Patent 5,330,747, Krzyzik, issued July 19, 1994. Thus, the preferred silicone substituent is methyl. Especially preferred are MQ resins wherein the M:Q ratio is from about 0.5:1.0 to about 1.5:1.0. Organosiloxane resins such as these are commercially available, for example, Wacker 803 and 804 available from Wacker Silicones Corporation of Adrian, Michigan, US, and G. E. 1170-002 (SR 1000) from the General Electric Company.

The level of the resin that is used in liquid treatment products of the present invention is dependent on its degree of solubility in the formulation, particularly in the solvents used.

Generally the range of resin used in the present invention is from about 5% to about 70%, preferably from about 15% to about 45% and most preferably from about 20% to about 40%.

In addition to the organosiloxane resins disclosed above, the liquid treatment products of the present invention may further comprise a fluid diorganopolysiloxane-based polymer to be combined with the organosiloxane resins. Said fluid diorganopolysiloxane-based polymers useful in the present invention span a large range of viscosities; from about 10 to about 10,000,000 mm²s⁻¹ at 25°C. Some diorganopolysiloxane-based polymers usefull in this invention exhibit viscosities greater than 10,000,000 mm²s⁻¹ at 25°C and therefore are characterized by manufacturer specific penetration testing. Examples of this characterization are GE silicone materials SE 30 and SE 63 with penetration specifications of 500-1500 and 250-600 (tenths of a millimeter) respectively.

Among the fluid diorganopolysiloxane polymers of the present invention are diorganopolysiloxane polymers comprising repeating units, where said units correspond to the formula (R₂SiO₃), where R is a monovalent radical containing from 1 to 6 carbon atoms, preferably selected from the group consisting of methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butyl, amyl, hexyl, vinyl, allyl, cyclohexyl, amino alkyl, phenyl, fluoroalkyl and mixtures thereof. The fluid diorganopolysiloxane polymers employed in the present invention may contain one or more of these radicals as substituents on the siloxane polymer backbone.
The fluid diorganopolysiloxane polymers may be terminated by triorganosilyl groups of the formula \((R_3\text{Si})\) where \(R\) is a monovalent radical selected from the group consisting of radicals containing from 1-6 carbon atoms, hydroxyl groups, alkoxy groups, and mixtures thereof. The fluid diorganopolysiloxane polymer must be compatible in solution with the organosiloxane resin and the volatile carrier. Further description of the organosiloxane resins and fluid diorganopolysiloxane polymers herein is contained in PCT application WO 01/01940.

**Solvents**

The liquid treatment product further comprises an organic solvent for the film-forming polymer which has a boiling point of less than 150°C, preferably less than 100°C, and a solubility parameter of less than 22 (MPa)^{0.5}. Solubility parameters are well known in the art and are readily available from tables, those used herein are SI Hildebrand values from Barton, Handbook of Solubility Parameters, CRC Press, 1983.

In the present invention, the film-forming polymer must be easily transferred to a treatment surface, such as tooth enamel. To achieve delivery, it is necessary that the polymers above be incorporated into a solvent, specifically a solvent which must quickly volatilize, leaving a film containing the active agent.

The organic solvent generally comprises from about 10% to about 90%, preferably from about 15% to about 80%, and more preferably from about 20% to about 70% of the liquid treatment product. The organic solvent is preferably selected from the group consisting of hydrocarbon oils, volatile silicones, non-hydrocarbon solvents, and mixtures thereof.

Hydrocarbon oils useful in the present invention include those having boiling points in the range of 60 - 150°C, more preferably hydrocarbon oils having from about C_6 to about C_10 chain lengths, most preferably C_7 to C_10 paraffins and isoparaffins. Most preferred is heptane.

The general classes of non-hydrocarbon solvents useful herein include esters, ketones, alcools, fluorocarbons and fluorocarbon ethers having boiling points in the range of 60 to 150°C. Non-hydrocarbon solvents or mixtures thereof particularly useful include those that are capable of solubilizing the resin and/or the diorganopolysiloxane-based polymer. Such solvents include but are not limited to butanone, ethyl acetate, propyl acetate, amyl acetate, ethyl butyrate, methyl nonafluorobutyl ether, methyl nonafluorobutyl ether, and mixtures thereof.

Preferred solvents are those selected from the group consisting of ethyl acetate, 2-butanol and heptane, more preferably 2-butanol (methyl ethyl ketone). Additional solvents may be used as required.

**Active agents**

The liquid treatment product further comprises an active agent. A broad range of active agents may be used, subject to compatibility with the polymers and resins herein, including oral and skin care benefit agents.

Most preferred are oral care active agents providing benefits of appearance and structural changes to teeth, whitening, stain bleaching, stain removal, plaque removal, tartar removal, cavity prevention and treatment, inflamed and/or bleeding gums, mucosal wounds, lesions, ulcers, aphthous ulcers, cold sores, tooth abscesses, and the elimination of mouth malodor resulting from the conditions above and other causes such as microbial proliferation.

Active agents include teeth color modifying substances such as pigments; anti-tartar agents, such as polyphosphates; fluoride ion sources such as sodium fluoride; antimicrobial agents such as triclosan; anti-inflammatory agents such as flurbiprofen or naproxen; nutrients such as zinc and vitamins; antioxidants such as ascorbic acid; H2 receptor antagonist compounds such as cimetidine and ranitidine; desensitizing agents such as potassium nitrate; and antiviral actives such as inorganic stannous halides.

A more complete listing of such actives is to be found in PCT publication WO 01/01940.

Other components including flavoring agents, sweetening agents, surfactants, rheology modifiers and chelants may also be included in the liquid treatment products of the present invention.

Preferred active agents are teeth whitening agents that remove or bleach intrinsic or extrinsic stains on or in the tooth surfaces. Such substances are preferably selected from the group consisting of the peroxides, metal chlorites, perborates, percarbonates, peroxycacids, persulfates, and combinations thereof. Suitable peroxide compounds include hydrogen peroxide, urea peroxide, calcium peroxide, carbamide peroxide, and mixtures thereof. Suitable metal chlorites include calcium chlorite, barium chlorite, magnesium chlorite, lithium chlorite, sodium chlorite, and potassium chlorite. Additional bleaching substances may be hypochlorite and chlorine dioxide. The preferred chlorite is sodium chlorite. A preferred percarbonate is sodium percarbonate. Preferred persulfates are oxones. The level of these substances is dependent on the available oxygen or chlorine respectively that the molecule is capable of providing to bleach the stain. This level is generally used in compositions of the present invention at levels from about 0.1% to about 35%, preferably from about 1 % to about 25% and most preferably from about 5% to about 10% of the liquid treatment product.
Sealed disposable package

[0036] Another element of the unit dose treatment product herein is a sealed disposable package comprising a laminate. The laminate comprises an aluminium barrier layer and a polymer contact layer selected from polypropylene, polyimide and nylon 12.

[0037] The package may comprise any suitable form such as sachets, peelable blisters and tear-open blisters. A preferred packaging form for the disposable package is a three seal sachet having a longitudinal seal and two transverse seals. The three seal sachet is preferably provided with a tear notch extending into one of the transverse seals. PCT application WO 95/01921 describes a suitable three seal sachet. US patents 5,222,813 and US 5,371,997 also describe packaging of suitable form. An alternately preferred disposable package form is a peelable blister comprising a tray portion and a cover made from the laminate, the cover being sealed to the tray portion. In such blisters the tray portion is preferably made from the same material as the contact layer of the laminate, most preferably it is polypropylene or has a polypropylene layer in contact with the liquid treatment product. The tray portion can also be formed from the laminate.

[0038] The aluminium barrier layer of the laminate is important to prevent escape of solvent and other volatiles from the package. Aluminium by itself is insufficient to form an effective package since it is difficult to seal to itself or to other materials by means of a heat seal. The polymer contact layer performs the function of allowing the package to be conveniently sealed with the liquid treatment product inside it. However, if the integrity of the seal is lost then the package is compromised. For this reason it has been found that the best materials for the polymer contact layer are polypropylene, polyimide and nylon 12. Polypropylene is preferred. Reference to these materials herein also includes copolymers comprising less than 20%, preferably less than 10%, more preferably less than 5% by weight of the polymer of other monomers.

[0039] Other materials may be used to construct further layers of the laminate sheet, for example to provide a printable outer surface. These can be any that are customary in the art, such as polyester, polypropylene, polyethylene and polyethylene terephthalate (PET). The layers are adhered to each other as is customary in the art. The thicknesses of the laminate layers are chosen on a combination of tear resistance, cost and barrier function. A suitable laminate for a three seal sachet comprises a 50 μm contact layer of polypropylene adhered to a 20 μm aluminium barrier layer which in turn is adhered to a 12 μm layer of PET which forms an outside layer of the sachet once the sachet is formed.

[0040] The package is sized to hold the desired amount of liquid treatment product forming the unit dose, taking into account any headspace desired. Suitable volumes of liquid treatment product are from about 0.1 ml to about 10 mls, preferably from about 0.2 ml to about 2 mls, more preferably from about 0.2 ml to about 1 ml.

Kits

[0041] The present invention also provides kits comprising a plurality of the unit dose treatment products and a plurality of applicators. An applicator may comprise a brush having an elongated handle or a replaceable brush portion to be used with a reusable handle. The brush can also be substituted by a sponge or swab. The kit elements may be packaged in a printed outer carton.

[0042] A kit preferably comprises one applicator per unit dose product since after use of the applicator it may be clogged by dried treatment product and be unsuitable for re-use. The number of applicators and unit dose products provided in a kit can vary from 10 to 25. In a preferred embodiment a kit contains fourteen applicators and fourteen unit dose products to suit a two week, daily use regimen. The kit may further include a lip retractor as described in PCT publication WO/02/07636 to hold back the lips whilst the liquid treatment product is being applied.

Methods of use

[0043] The invention further relates to a product for treating the soft or hard tissues of the oral cavity the treatment comprising: opening the package of a unit dose treatment product as herein described, applying the liquid treatment product to the soft or hard tissues of the oral cavity; and allowing the solvent to evaporate and leaving residual treatment product in contact with the soft or hard tissues of the oral cavity for a treatment period of at least 10 minutes. An additional step of removing residual treatment product at the end of the treatment period may be necessary. For this purpose a toothbrush may also be included in the kit. The treatment period is preferably one hour or more and more preferably overnight.

[0044] The product above is intended for an extended regimen and is preferably repeated on a daily basis for a period of seven to twenty-one days, preferably fourteen days. Longer or shorter periods for the regimen may of course be used dependant on the treatment to be applied and the desired effect.

[0045] Usage instructions on how to use the kit elements and follow the required regimen should generally also be included in the kit.
Example

[0046] This is a representative liquid treatment product for use in the present invention. Other representative liquid treatment products are disclosed in PCT publication WO 01/01940.

<table>
<thead>
<tr>
<th>Material</th>
<th>% by weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue pigment, 15% dispersion in polydimethylsiloxane</td>
<td>0.05</td>
</tr>
<tr>
<td>SE30&lt;sup&gt;3&lt;/sup&gt; premix - 9.76% SE30&lt;sup&gt;3&lt;/sup&gt; in DC200/20&lt;sup&gt;1&lt;/sup&gt;</td>
<td>10.25</td>
</tr>
<tr>
<td>DC200/12500&lt;sup&gt;1&lt;/sup&gt;</td>
<td>1.0</td>
</tr>
<tr>
<td>DC200/20&lt;sup&gt;1&lt;/sup&gt;</td>
<td>9.2</td>
</tr>
<tr>
<td>2-butane</td>
<td>3.0</td>
</tr>
<tr>
<td>Ethyl acetate</td>
<td>5.0</td>
</tr>
<tr>
<td>MQ resin&lt;sup&gt;2&lt;/sup&gt;</td>
<td>32.5</td>
</tr>
<tr>
<td>Flavour</td>
<td>2.0</td>
</tr>
<tr>
<td>Sodium bicarbonate</td>
<td>8.0</td>
</tr>
<tr>
<td>AF230</td>
<td>6.5</td>
</tr>
<tr>
<td>Fumed silica</td>
<td>3.5</td>
</tr>
<tr>
<td>Sodium Percarbonate</td>
<td>19.0</td>
</tr>
</tbody>
</table>

<sup>1</sup> Polydimethylsiloxanes from Dow Corning  
<sup>2</sup> Organosiloxane resin from General Electric  
<sup>3</sup> A dimethicone gum from General Electric

[0047] 0.5 ml of the liquid treatment product is packaged in a sealed three seal sachet to form a unit dose treatment product. The sachet is formed from a laminate comprising a 50 μm contact layer of polypropylene adhered to a 20 μm aluminium barrier layer which in turn is adhered to a 12 μm layer of PET which forms an outside layer of the sachet once the sachet is formed by heat sealing. Fourteen such unit dose treatment products and fourteen brush applicators are enclosed in a carton, thereby forming a kit. The carton further includes usage instructions as follows:

1. teeth and dry teeth.  
2. Hold pack upright and tear firmly following line of notch  
3. Pick up a drop on your brush (each sachet contains at least ten drops or brush-loads)  
4. Apply to teeth  
5. Keep mouth open for a 60 seconds to allow the whitening film to form  
6. Leave overnight and brush off as normal in the morning

Claims

1. A unit dose treatment product comprising:
   a) a scaled disposable package comprising a laminate wherein the laminate comprises;
      i) an aluminium barrier layer; and  
      ii) a polymer contact layer selected from polypropylene, polyamide and nylon 12;
   b) a liquid treatment product contained within the package, wherein the liquid treatment product comprises:
      i) a film-forming polymer;
ii) an organic solvent for the film-forming polymer having a boiling point of less than 150°C and a solubility parameter of less than 22 (MPa)^0.5; and
iii) an active agent;

wherein the polymer contact layer of the laminate is in contact with the liquid treatment product.

2. A unit dose treatment product according to Claim 1 wherein the polymer contact layer is polypropylene.

3. A unit dose treatment product according to Claim 1 or Claim 2 wherein the solvent is selected from ethyl acetate, 2-butanone and heptane, preferably wherein the solvent is 2-butanone.

4. A unit dose treatment product according to any preceding claim wherein the film-forming polymer is an organosiloxane resin.

5. A unit dose treatment product according to any preceding claim wherein the active agent is a tooth whitening agent, preferably sodium percarbonate.

6. A unit dose treatment product according to any preceding claim wherein the disposable package is a three seal sachet having a longitudinal seal and two transverse seals.

7. A unit dose treatment product according to Claim 6 wherein the sachet includes a tear notch extending into one of the transverse seals.

8. A unit dose treatment product according to any one of Claims 1 to 5 wherein the disposable package is a peelable blister comprising a tray portion and a cover made from the laminate, the cover being sealed to the tray portion.

9. A unit dose treatment product according to Claim 8 wherein the tray portion is formed from polypropylene or has a polypropylene layer in contact with the liquid treatment product.

10. A kit comprising a plurality of treatment products according to any preceding claim and a plurality of applicators.

11. A kit according to Claim 10 which comprises one applicator per unit dose product.

12. A kit according to Claim 10 or Claim 11 which further comprises a lip retractor and/or a toothbrush.

13. A kit according to any one of Claims 10 to 12 which comprises from 10 to 25 applicators and from 10 to 25 unit dose products, preferably fourteen applicators and fourteen unit dose products.

14. A unit dose treatment product according to Claim 1 for treating the soft or hard tissues of the oral cavity, the treatment comprising:

   a) opening the package of a unit dose treatment product according to Claim 1; and
   b) applying the liquid treatment product to the soft or hard tissues of the oral cavity; and
   c) allowing the solvent to evaporate and leaving residual treatment product in contact with the soft or hard tissues of the oral cavity for a treatment period of at least 10 minutes.

15. A product according to Claim 14 wherein the treatment further comprises a step of removing the residual treatment product at the end of the treatment period.

16. A product according to Claim 14 wherein the treatment period is about one hour or more, preferably overnight.

17. A product according to Claim 14 wherein steps a) to c) are repeated daily for a period of seven to twenty-one days, preferably fourteen days.

Patentansprüche

1. Einheitsdosis-Behandlungsprodukt, umfassend:
a) eine verschweißte Einwegverpackung, umfassend ein Laminat, wobei das Laminat Folgendes umfasst:
   i) eine Aluminiumsperrschicht; und
   ii) eine Polymerkontaktschicht, ausgewählt aus Polypropylen, Polyamid und Nylon 12;

b) ein in der Verpackung enthaltenes flüssiges Behandlungsprodukt, wobei das flüssige Behandlungsprodukt Folgendes umfasst:
   i) ein filmbildendes Polymer;
   ii) ein organisches Lösemittel für das filmbildende Polymer mit einem Siedepunkt von weniger als 150 °C und einem Löslichkeitsparameter von weniger als 22 (MPa)\(^{0.5}\); und
   iii) einen Wirkstoff;

wobei die Polymerkontaktschicht des Laminats in Kontakt mit dem flüssigen Behandlungsprodukt ist.

2. Einheitsdosis-Behandlungsprodukt nach Anspruch 1, wobei die Polymerkontaktschicht Polypropylen ist.

3. Einheitsdosis-Behandlungsprodukt nach Anspruch 1 oder Anspruch 2, wobei das Lösemittel ausgewählt ist aus Ethylacetat, 2-Butanon und Heptan, wobei das Lösemittel vorzugsweise 2-Butanon ist.

4. Einheitsdosis-Behandlungsprodukt nach einem der vorstehenden Ansprüche, wobei das flüssige Behandlungsprodukt ein Organosilosaxanharz ist.

5. Einheitsdosis-Behandlungsprodukt nach einem der vorstehenden Ansprüche, wobei der Wirkstoff ein Zahnauflöschungsmittel, vorzugsweise Natriumpercarbonat, ist.

6. Einheitsdosis-Behandlungsprodukt nach einem der vorstehenden Ansprüche, wobei die Einwegverpackung ein Beutel mit drei Versiegelungen ist, der eine Längsversiegelung und zwei Querversiegelungen aufweist.

7. Einheitsdosis-Behandlungsprodukt nach Anspruch 6, wobei der Beutel eine Aufrisskerbe aufweist, die sich in eine der Querversiegelungen erstreckt.

8. Einheitsdosis-Behandlungsprodukt nach einem der Ansprüche 1 bis 5, wobei die Einwegverpackung ein abziehbarer Blister ist, der einen Schalenteil und eine aus dem Laminat hergestellte Abdeckung umfasst, wobei die Abdeckung mit dem Schalenteil verschweißt ist.

9. Einheitsdosis-Behandlungsprodukt nach Anspruch 8, wobei der Schalenteil aus Polypropylen geformt ist oder eine Polypropylenischicht aufweist, die in Kontakt mit dem flüssigen Behandlungsprodukt ist.


11. Satz nach Anspruch 10, welcher einen Applikator pro Einheitsdosis-Produkt umfasst.

12. Satz nach Anspruch 10 oder Anspruch 11, welcher ferner einen Lippenretraktor und/oder eine Zahnbißste umfasst.


14. Einheitsdosis-Behandlungsprodukt nach Anspruch 1 zur Behandlung des weichen oder harten Gewebes der Mundhöhle, wobei die Behandlung Folgendes umfasst:

   a) Öffnen der Verpackung eines Einheitsdosis-Behandlungsprodukts nach Anspruch 1; und
   b) Auftragen des flüssigen Behandlungsprodukts auf das weiche oder harte Gewebe der Mundhöhle; und
   c) Verdampfenlassen des Lösemittels und Belassen des restlichen Behandlungsprodukts in Kontakt mit dem weichen oder harten Gewebe der Mundhöhle für einen Behandlungszeitraum von mindestens 10 Minuten.

15. Produkt nach Anspruch 14, wobei die Behandlung ferner einen Schritt des Entfernens des restlichen Behandlungs-
produkts am Ende des Behandlungszeitraums umfasst.

16. Produkt nach Anspruch 14, wobei der Behandlungszeitraum etwa eine Stunde oder mehr beträgt, vorzugsweise über Nacht.

17. Produkt nach Anspruch 14, wobei die Schritte a) bis c) für einen Zeitraum von sieben bis einundzwanzig Tagen, vorzugsweise vierzehn Tagen, täglich wiederholt werden.

Revendications

1. Produit de traitement en dose unitaire comprenant :
   a) un conditionnement jetable scellé comprenant un stratifié où le stratifié comprend :
      i) une couche de barrière en aluminium ; et
      ii) une couche de contact polymère choisie parmi le polypropylène, le polyamide et le nylon 12 ;
   b) un produit de traitement liquide contenu au sein du conditionnement, où le produit de traitement liquide comprend :
      i) un polymère filmogène ;
      ii) un solvant organique pour le polymère filmogène ayant un point d’ébullition de moins de 150 °C et un paramètre de solubilité de moins de 22 (MPa)\(^{0.5}\) ; et
      iii) un agent actif ;

dans lequel la couche de contact polymère du stratifié est en contact avec le produit de traitement liquide.

2. Produit de traitement en dose unitaire selon la revendication 1, dans lequel la couche de contact polymère est du polypropylène.

3. Produit de traitement en dose unitaire selon la revendication 1 ou la revendication 2, dans lequel le solvant est choisi parmi l’acétate d’éthyle, le 2-butanol et l’heptane, de préférence dans lequel le solvant est le 2-butanol.

4. Produit de traitement en dose unitaire selon l’une quelconque des revendications précédentes, dans lequel le polymère filmogène est une résine organosiloxane.

5. Produit de traitement en dose unitaire selon l’une quelconque des revendications précédentes, dans lequel l’agent actif est un agent de blanchissement des dents, de préférence du percarbonate de sodium.

6. Produit de traitement en dose unitaire selon l’une quelconque des revendications précédentes, dans lequel le conditionnement jetable est un sachet à trois joints ayant un joint longitudinal et deux joints transversaux.

7. Produit de traitement en dose unitaire selon la revendication 6, dans lequel le sachet inclut une encoche déchirable s’étendant dans un des joints transversaux.

8. Produit de traitement en dose unitaire selon l’une quelconque des revendications 1 à 5, dans lequel le conditionnement jetable est un blister détachable comprenant une partie de plateau et un couvercle constitué du stratifié, le couvercle étant scellé à la partie de plateau.

9. Produit de traitement en dose unitaire selon la revendication 8, dans lequel la partie de plateau est formée de polypropylène ou a une couche polypropylène en contact avec le produit de traitement liquide.

10. Trousse comprenant une pluralité de produits de traitement selon l’une quelconque des revendications précédentes et une pluralité d’applicateurs.

11. Trousse selon la revendication 10, qui comprend un applicateur par produit en dose unitaire.
12. Trousse selon la revendication 10 ou la revendication 11, qui comprend, en outre, un écarteur de lèvre et/ou une brosse à dents.

13. Trousse selon l’une quelconque des revendications 10 à 12, qui comprend de 10 à 25 applicateurs et de 10 à 25 produits en dose unitaire, de préférence quatorze applicateurs et quatorze produits en dose unitaire.

14. Produit de traitement en dose unitaire selon la revendication 1 pour le traitement des tissus mous ou durs de la cavité buccale, le traitement comprenant les étapes consistant à :

   a) ouvrir le conditionnement d’un produit de traitement en dose unitaire selon la revendication 1 ; et
   b) appliquer le produit de traitement liquide aux tissus mous ou durs de la cavité buccale ; et
   c) permettre au solvant de s’évaporer et de laisser le produit de traitement résiduel en contact avec les tissus mous ou durs de la cavité buccale pendant une période de traitement d’au moins 10 minutes.

15. Produit selon la revendication 14, dans lequel le traitement comprend, en outre, une étape consistant à éliminer le produit de traitement résiduel à la fin de la période de traitement.

16. Produit selon la revendication 14, dans lequel la période de traitement est d’environ une heure ou plus, de préférence jusqu’au lendemain.

17. Produit selon la revendication 14, dans lequel les étapes a) à c) sont répétées quotidiennement pendant une période de sept à vingt-et-un jours, de préférence quatorze jours.
REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader’s convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 0101940 A [0002] [0023] [0033] [0046]
- US 5330747 A, Krzysik [0018]
- WO 9501921 A [0037]
- US 5222813 A [0037]
- US 5371997 A [0037]
- WO 0207636 A [0042]

Non-patent literature cited in the description