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(54) WET SHAVING SYSTEM WITH SHAVING AID COMPOSITE WITH A NON-VOLATILE COOLING AGENT

NASSRASIERER MIT RASIERHILFECOMPOSITE MIT NICHTFLÜCHTIGEM KÜHLMITTEL

RASOIR AVEC COMPOSITE FACILITANT LE RASAGE, COMPRENANT UN AGENT RAFRAÎCHISSANT, NON VOLATIL

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(56) References cited:  
EP-A- 0 348 627  
DE-A- 2 608 226  
US-A-  4 875 287

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[0001] The present invention relates to a shaving system of the wet shave type a shaving aid composite.

[0002] It is now well known that shaving comfort can be enhanced by affixing to a razor cartridge a shaving aid composite, also known as a lubricating strip, which continuously releases a shaving aid, typically a lubricant, during the shaving process. See, for example, U.S. 4,170,821 and GB 2,024,082. The shaving aid composite generally comprises a water-insoluble polymer matrix, typically polyurethane, and a water-soluble shaving aid, typically polyethylene oxide, which leaches out of the composite during shaving to enhance shave comfort.

[0003] Unfortunately, conventional shaving aid composites suffer from the disadvantage that they release an insufficient amount of the shaving aid, particularly after the first three or four shaves where release of the shaving aid may drop off to negligible quantities. Accordingly, recent efforts have been made to improve shaving aid composites so as to enhance and prolong release of the shaving aid. Such efforts have resulted in improved shaving aid composites which include the following: incorporation of low molecular weight release enhancing agent, such as polyethylene glycol, into the matrix, disclosed in U.S. 5,113,585; the use of ethylene vinyl acetate copolymer as the matrix material, disclosed in U.S. 5,349,750; incorporation of a water-swelling polymer such as Salsorb 84, a cross-linked polyacrylic, disclosed in WO 95/07803; incorporation of a compatibilizer material such as polyethylene oxide-polypropylene oxide copolymer (e.g. Poloxamer 182), disclosed in U.S. 5,454,164; and co-extrusion of a core comprising a water-leachable shaving aid within a sheath of water-insoluble polymer, wherein the sheath has a plurality of openings to facilitate release of the shaving aid, disclosed in WO 96/13360. All of the aforementioned patents or patent applications are incorporated herein by reference.

[0004] It has also been suggested in U.S. 5,095,619 that a water-insoluble essential oil, such as menthol, may be advantageously included in a shaving aid composite. However, it has been found in practice that a substantial amount of the essential oil is lost due to volatilization prior to use, rendering the composite unable to deliver an effective amount of the essential oil. It is an object of the present invention to provide a shaving aid composite (i.e. lubricating strip) which is capable of retaining during normal storage conditions substantially all of a cooling agent included during fabrication of the composite and delivering an effective amount of the cooling agent during use.

[0005] The present invention is directed to a shaving system of the wet shave type as defined in claim 1. The shaving system may be a disposable shaving cartridge adapted for coupling to and uncoupling from a razor handle or it may be a shaving head which is integral with a razor handle so that the complete razor is discarded as a unit when the blade or blades become dulled. The blade edge cooperates with the skin engaging portion to define shaving geometry.

Fig. 1 is a perspective view of a razor unit in accordance with the invention;

Fig. 2 is a sectional view taken along the line 2-2 of Fig. 1; and

Fig. 3 is a perspective view of another razor unit in accordance with the invention.

[0006] The skin engaging portion includes an improved shaving aid composite which comprises a non-volatile cooling agent, such as a non-volatile menthol analog. Preferably the shaving aid composite comprises a matrix of a water-insoluble polymer and, dispersed within the matrix, a skin lubricating water-soluble polymer and a non-volatile cooling agent. Alternatively, the shaving aid composite may comprise a sheath of water-insoluble polymer that surrounds a core which includes a skin-lubricating water-soluble polymer and a non-volatile cooling agent. The improved shaving aid composite (or lubricating strip) is capable of retaining during normal storage conditions substantially all of the cooling agent included during fabrication of the composite and delivering an effective amount of the cooling agent during use.

[0007] The shaving unit 10 shown in Figs. 1 and 2 includes base or platform member 12 molded of high impact polystyrene that includes integral coupling groove structure 14 for attachment to a razor handle and guard structure 16 that defines a transversely extending forward skin engaging surface 18. On the upper surface of platform 12 are disposed steel leading blade 20 having a sharpened edge 22, steel following blade 24 having sharpened edge 26, and aluminum spacer member 28 that maintains blades 20 and 24 in spaced relation. Cap member 30 is molded of high impact polystyrene and has body portion 32 that defines skin engaging surface 34 that extends transversely between forwardly projecting end walls 36 and has a front edge 38 that is disposed rearwardly of blade edge 26. Integral rivet portions 40 extend downwardly from transversely extending body portion 32 and pass through holes in blades 20 and 24, spacer 28, and platform 12 to secure cap 30, blades 20, 24 and spacer 28 on platform 12. Adhesively affixed to skin engaging surface 34 is shaving aid composite 42.

[0008] The shaving unit 50 shown in Fig. 3 is of the type shown in Jacobson, U.S. 4,586,255, and includes body 52 with front portion 54 and rear portion 56. Resiliently secured in body 52 are guard member 58, leading blade unit 60 and trailing blade unit 62. A shaving aid composite in the form of elongated insert member 64 is frictionally locked in opening 66 of rear portion 56. The shaving aid composite incorporates a shaving aid which, upon contact with water, leaches out of the composite onto the skin of the user during shaving to improve the shave attributes. While shown at the rear portion of this particular shaving unit, the shaving aid composite may be located at any skin-engaging portion.
of the shaving unit and may be fabricated in any size or shape deemed appropriate.

[0009] The shaving aid composite comprises a non-volatile cooling agent, such as a non-volatile menthol analog. Preferably the shaving aid composite comprises a matrix of a water-insoluble polymer and, dispersed within the matrix, a skin lubricating water-soluble polymer and a non-volatile cooling agent. Alternatively, the shaving aid composite may comprise a sheath of water-insoluble polymer that surrounds a core which includes a skin-lubricating water-soluble polymer and a non-volatile cooling agent, the sheath having a plurality of openings to facilitate release of the water-soluble polymer and cooling agent. The shaving aid composite may also optionally include low molecular weight water-soluble release enhancing agents such as polyethylene glycol (e.g. 1-10% by weight), water-swellable release enhancing agents such as cross-linked polyacrylcs (e.g. 2-7% by weight), colorants, antioxidants, preservatives, microbiocidal agents, beard softeners, astringents, depilatories, medicinal agents, conditioning agents, etc.

[0010] Suitable water-insoluble polymers which can be used for the matrix (or sheath) include polyethylene, polypropylene, polyisotere, butadiene-styrene copolymer (e.g. medium and high impact polystyrene), polyacetal, acrylonitrile-butadiene-styrene copolymer, ethylene vinyl acetate copolymer and blends such as polypropylene/polystyrene blend.

[0011] Preferably the water-insoluble polymer comprises about 10 to 50%, more preferably about 15 to 40%, and most preferably about 20 to 35% by weight of the shaving aid composite. The more preferred water-insoluble polymer is polystyrene, preferably a general purpose polystyrene such as Dow STYRON (Dow Chemical Company) or a high impact polystyrene (i.e. polystyrene-butadiene), such as Mobil 4324 (Mobil Corporation). The composite should contain a sufficient quantity of water-insoluble polymer to provide adequate mechanical strength, both during production and use.

[0012] Suitable skin lubricating water-soluble polymers include polyethylene oxide, polyvinyl pyrroldone, polyacrylamide, hydroxypropyl cellulose, polyvinyl imidazoline, and polyhydroxyethylmethacrylate. Preferably the water-soluble polymer comprises about 20 to 80%, more preferably about 40 to 75%, by weight of the shaving aid composite.

[0013] The more preferred water-soluble polymers are the polyethylene oxides generally known as POLYOX (available from Union Carbide Corporation) or ALKOX (available from Meisei Chemical Works, Kyoto, Japan). These polyethylene oxides will preferably have molecular weights of about 100,000 to 6 million, most preferably about 300,000 to 5 million. The most preferred polyethylene oxide comprises a blend of about 40 to 80% of polyethylene oxide having an average molecular weight of about 5 million (e.g. POLYOX COAGULANT) and about 60 to 20% of polyethylene oxide having an average molecular weight of about 300,000 (e.g. POLYOX WSR-N-750). The polyethylene oxide blend may also advantageously contain up to about 10% by weight of a low molecular weight (i.e. MW<10,000) polyethylene glycol such as PEG-100.

[0014] The non-volatile cooling agent will generally comprise about 1% to about 25%, preferably about 2% to about 20%, most preferably about 10% to about 17%, by weight of the shaving aid composite. By non-volatile cooling agent is meant an agent which has a physiological cooling effect on the skin and which is appreciably less volatile than menthol. Preferably, the non-volatile cooling agent will be one which when subjected to thermogravimetric analysis (e.g. using a 951 Thermogravimetric Analyzer from Dupont with a 20°C temperature rise per minute) will retain at least 50% of its initial weight at a temperature of 160°C, more preferably at least 80% of its initial weight at a temperature of 160°C, and most preferably at least 50% of its initial weight at a temperature of 175°C.

[0015] Suitable cooling agents which can be utilized include non-volatile menthol analogs such as menthyl lactate, menthyl ethoxycacetate, methylene glycolacetic, 3-methoxypropane-1,2-diol, ethyl menthyl carbonate, (1S,3S,4R)-p-menth-8-ol-3-ol, menthyl pyrrolidone carboxylate, N-substituted-p-menthane-3-carboxamides (as described in U.S. 4,136,163, which is incorporated herein by reference) including, for example, N-ethyl-p-menthane-3-carboxamide, acyclic carboxamides of the formula

\[
\begin{align*}
  R^1 & \\
  R^2 & \longrightarrow C^* - CONR' R'' \\
  R^3 & 
\end{align*}
\]

where \( R^1 \) and \( R^3 \), when taken separately, are each hydrogen, \( C_3-C_8 \) alkyl or \( C_1-C_3 \) hydroxyalkyl and provide a total of no more than 8 carbon atoms, with the proviso that when \( R^1 \) is hydrogen \( R^3 \) may also be alkylcarboxylalkyl of up to 6 carbon atoms; \( R^2 \) and \( R'' \), when taken together, represent an alkylene group of up to 6 carbon atoms thereby forming a nitrogen heterocycle, the alkylene chain being optionally interrupted by oxygen; \( R^1 \) is hydrogen or \( C_1-C_3 \) alkyl; and \( R^2 \) and \( R'' \) are each \( C_1-C_3 \) alkyl (such acyclic carboxamides being described in U.S. 4,153,679, which is incorporated herein by reference) including, for example, N,2,3-trimethyl-2-isopropylbutanamide, and ketal coolants (as described in WO 93/23005, which is incorporated herein by reference) including, for example, 1-methon-\( \alpha \)-ismethon glycerin
Shaving aid composites of the present invention may be fabricated by any appropriate method, including injection molding and extrusion, the latter being preferred. All of the components of the composite are blended prior to molding or extrusion. For best results, it is preferred that the components are dry.

The blended components may be extruded through a Haake System 90 3/4 inch diameter extruder with a barrel pressure of about 1000-2000 psi, a rotor speed of about 10 to 50 rpm, and a temperature of about 150-185°C and a die temperature of about 170-185°C. Alternatively, a 1 1/4 inch single screw extruder may be employed with a processing temperature of 175-200°C, preferably 185-190°C, a screw speed of 20 to 50 rpm, preferably 25 to 35 rpm, and an extrusion pressure of 1800 to 5000 psi, preferably 2000 to 3500 psi. The extruded strip is air cooled to about 25°C. To injection mold the strips it is preferred to first extrude the powder blend into pellets. This can be done on a 1/4 or 1 1/2 inch single screw extruder at a temperature of 120-180°C, preferably 140-150°C, with a screw speed of 20 to 100 rpm, preferably 45 to 70 rpm. The pellets are then molded in either a single material molding or multi-material molding machine, which may be single cavity or multi-cavity, optionally equipped with a hotrunner system. The process temperature can be from 165 to 250°C, preferably from 180 to 225°C. The injection pressure should be sufficient to fill the part completely without flashing. Depending on the cavity size, configuration and quantity, the injection pressure can range from 300 to 2500 psi. The cycle time is dependent on the same parameters and can range from 3 to 30 seconds, with the optimum generally being about 6 to 15 seconds.

The invention may be further illustrated by the following examples in which all parts and percentages are by weight.

Example

Shaving aid composites similar to insert member 64 shown in Fig. 3 are fabricated from the blends indicated below by extruding the blends through a Haake System 90 3/4 inch diameter extruder with a barrel pressure of about 1000-2000 psi, a rotor speed of about 10 to 50 rpm, and a temperature of about 150-185°C and a die temperature of about 170-185°C. The extruded strip of composite is cooled and sliced to appropriate lengths for securing into openings 66 of shaving units 50. In the blends listed below, the polystyrene is Dow STYRON or Mobil 2824, the high impact polystyrene ("Hips") is Mobil 4324, the polyethylene oxide (60/40) is a blend of 60% POLYOX COAGULANT (M.W. 5 million) and 40% POLYOX WSR-N-750 (M.W. 300,000), and the polyethylene glycol ("PEG") is Dow 4500 PEG (MW=4500). The cooling agents used are 3-i-methoxypropane-1,2-diol (Cooling Agent 10), N-ethyl-p-methane-3-carboxamide (WS-3), N,2,3-trimethyl-2-isopropylbutanamide (WS-23), menthol lactate (Frescolat ML), methion glycerinacetal (Frescolat MGA) and menthol ethoxyacetate (Menglytate).
<table>
<thead>
<tr>
<th>Blend A</th>
<th>Blend B</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.5% Hips</td>
<td>30.2% Hips</td>
</tr>
<tr>
<td>46.8% polyethylene oxide</td>
<td>49.5% polyethylene oxide</td>
</tr>
<tr>
<td>8.5% PEG</td>
<td>9.0% PEG</td>
</tr>
<tr>
<td>15.0% Cooling Agent 10</td>
<td>10.0% Cooling Agent 10</td>
</tr>
<tr>
<td>1.2% colorant/antioxidant</td>
<td>1.3% colorant/antioxidant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blend C</th>
<th>Blend D</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.9% Hips</td>
<td>32.9% Hips</td>
</tr>
<tr>
<td>52.3% polyethylene oxide</td>
<td>53.9% polyethylene oxide</td>
</tr>
<tr>
<td>9.5% PEG</td>
<td>9.8% PEG</td>
</tr>
<tr>
<td>5.0% Cooling Agent 10</td>
<td>2.0% Cooling Agent 10</td>
</tr>
<tr>
<td>1.3% colorant/antioxidant</td>
<td>1.4% colorant/antioxidant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blend E</th>
<th>Blend F</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.5% Hips</td>
<td>30.2% Hips</td>
</tr>
<tr>
<td>46.8% polyethylene oxide</td>
<td>49.5% polyethylene oxide</td>
</tr>
<tr>
<td>8.5% PEG</td>
<td>9.0% PEG</td>
</tr>
<tr>
<td>15.0% WS-3</td>
<td>10.0% WS-3</td>
</tr>
<tr>
<td>1.2% colorant/antioxidant</td>
<td>1.3% colorant/antioxidant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blend G</th>
<th>Blend H</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.5% Hips</td>
<td>29.5% Hips</td>
</tr>
<tr>
<td>46.8% polyethylene oxide</td>
<td>48.4% polyethylene oxide</td>
</tr>
<tr>
<td>8.5% PEG</td>
<td>8.8% PEG</td>
</tr>
<tr>
<td>10.0% WS-3</td>
<td>10.0% WS-3</td>
</tr>
<tr>
<td>5.0% Poloxamer 182</td>
<td>2.0 Na dodecybenzene sulfonate</td>
</tr>
<tr>
<td>1.2% colorant/antioxidant</td>
<td>1.3% colorant/antioxidant</td>
</tr>
</tbody>
</table>
Blend I
31.2% Hips
51.2% polyethylene oxide
9.3% PEG
5.0% WS-3
2.0% Na dodecylbenzenesulfonate
1.3% colorant/antioxidant

Blend J
31.9% Hips
52.3% polyethylene oxide
9.5% PEG
5.0% WS-3
1.3% colorant/antioxidant

Blend K
24.0% polystyrene
59.4% polyethylene oxide
5.3% Salsorb 88
10.0% WS-3
1.3% colorant/antioxidant

Blend L
28.5% Hips
46.8% polyethylene oxide
8.5% PEG
15.0% WS-23
1.2% colorant/antioxidant

Blend M
31.9% Hips
52.3% polyethylene oxide
9.5% PEG
5.0% WS-23
1.3% colorant/antioxidant

Blend N
30.2% Hips
49.5% polyethylene oxide
9.0% PEG
10.0% Frescolat ML
1.3% colorant/antioxidant

Blend O
30.2% Hips
49.5% polyethylene oxide
9.0% PEG
10.0% Frescolat MGA
1.3% colorant/antioxidant

Blend P
30.2% Hips
49.5% polyethylene oxide
9.0% PEG
10.0% Menglytate
1.3% colorant/antioxidant

[0020] Each of the foregoing strips retains a substantial portion (i.e. >50%) of the cooling agent (i.e. menthol analog) included during fabrication when stored at 45°C for four days. In addition, each of the foregoing strips releases cooling agent when contacted with water.

Claims

1. A shaving system of the wet shave type comprising a blade member (20, 24, 60, 62) and structure (30, 52) defining an external skin engaging portion (32, 58) in proximity to said blade member, said skin engaging portion (32, 56)
including a shaving aid composite (42, 64) comprising a cooling agent, characte

2. The shaving system according to claim 1 wherein the shaving aid composite additionally comprises a water-insoluble polymer and a skin lubricating water-soluble polymer.

3. The shaving system according to claim 1 wherein the shaving aid composite additionally comprises a matrix of a water-insoluble polymer and, dispersed within the matrix, a skin lubricating water-soluble polymer and the non-volatile cooling agent.

4. The shaving system according to any preceding claim wherein the non-volatile cooling agent is a non-volatile menthol analog.

5. The shaving system according to any preceding claim wherein the non-volatile cooling agent is selected from menthol, menthol acetate, and ethyl menthol carbonate.

6. The shaving system according to any preceding claim wherein the shaving aid composite comprises about 15% to about 40% by weight of the water-insoluble polymer, about 20% to about 80% by weight of the water-soluble polymer, and about 1% to about 25% by weight of the non-volatile cooling agent.

7. The shaving system according to claim 6 wherein the water-insoluble polymer is selected from the group consisting of polystyrene, polypeptide, polystyrene-butadiene copolymer, polystyrene, and polystyrene-vinyl copolymer.

8. The shaving system according to any preceding claim wherein the shaving aid composite comprises about 20% to about 35% by weight polystyrene or polystyrene-butadiene, about 40% to about 75% by weight polyethylene oxide and about 2% to about 20% by weight non-volatile cooling agent.

9. The shaving system according to any preceding claim wherein the water-soluble polymer comprises a blend of polyethylene oxide having an average molecular weight of about 5 million and a polyethylene oxide having an average molecular weight of about 300,000.

10. The shaving system according to any preceding claim wherein the shaving aid composite additionally comprises polyethylene glycol and/or a water-swellable polymer.

11. The shaving system according to any preceding claim wherein the non-volatile cooling agent is one which, when subjected to thermogravimetric analysis, retains at least 50% of its initial weight at a temperature of 160°C.

12. The shaving system according to any preceding claim wherein the non-volatile cooling agent is one which, when subjected to thermogravimetric analysis, retains at least 80% of its initial weight at a temperature of 160°C.

13. The shaving system according to any preceding claim wherein the non-volatile cooling agent is one which, when subjected to thermogravimetric analysis, retains at least 50% of its initial weight at a temperature of 175°C.

Patentansprüche

1. Rasiersystem vom Naßrasiertyp, umfassend ein Klingenteil (20, 24, 60, 62) und Aufsatz (30, 52), die einen äußeren, auf die Haut aufsetzenden Abschnitt (32, 56) unmittelbar an dem Klingenteil festlegen, wobei der auf die Haut aufsetzende Abschnitt (32, 56) ein Rasierhilfe-Composite (42, 64) einschließt, das ein Kühlmittel aufweist, dadurch gekennzeichnet, daß das Kühlmittel nichtflüchtig ist.

2. Rasiersystem nach Anspruch 1, bei welchem das Rasierhilfe-Composite zusätzlich ein wasseraufgelöstes Polymer und ein die Haut gleichförmig machendes wasserlösliches Polymer umfaßt.
3. Rasiersystem nach Anspruch 1, bei welchem das Rasierhilfe-Composite zusätzlich eine Matrix eines wasserunlöslichen Polymers und in der Matrix dispergiert ein die Haut gleitfähigmachendes wasserlösliches Polymer und das nichtflüchtige Kühlmittel umfaßt.

4. Rasiersystem nach einem der vorgenannten Ansprüche, wobei das nichtflüchtige Kühlmittel ein nichtflüchtiges Menthol-Analog ist.

5. Rasiersystem nach einem der vorgenannten Ansprüche, wobei das nichtflüchtige Kühlmittel ausgewählt wird aus: Menthyllactat, Menthylethoxycetat, Menthonglycerinacetat, 3-/4-Menthoxypropan-1,2-diol, Ethyl-/menthylcarbonat, (1S,3S,4R)-p-Menth-8-en-3-ol, Menthylpyrrolidoncarboxylat, N-Ethyl-p-menthan-3-carboxamid, N2,3-Trime-thyl-2-isopropyl-butamid und p-Menthon-id-isomethon-glycerinketal.

6. Rasiersystem nach einem der vorgenannten Ansprüche, bei welchem das Rasierhilfe-Composite umfaßt: etwa 15 % bis etwa 40 Gewichtsprozent wasserunlösliches Polymer, etwa 20 % bis etwa 80 Gewichtsprozent wasserlösliches Polymer und etwa 1 % bis etwa 25 Gewichtsprozent des nichtflüchtigen Kühlmittels.

7. Rasiersystem nach Anspruch 6, bei welchem das wasserunlösliche Polymer ausgewählt wird aus der Gruppe, bestehend aus Polyethylene, Polypropylene, Polystyrol, Polystyrol/Butadien-Copolymer, Polycacetat, Acrynitril/Butadien/Styrol-Copolymer und Ethylen/Vinylacetat-Copolymer, und bei welchem das wasserlösliche Polymer ausgewählt wird aus der Gruppe, bestehend aus Polyethylenoxid, Polyvinylpyrrolidon, Polyacrylamid, Hydroxypropylcellulose, Polyvinylimidazolin und Polyhydroxyethylmethacrylat.

8. Rasiersystem nach einem der vorgenannten Ansprüche, bei welchem das Rasierhilfe-Composite umfaßt: etwa 20 % bis etwa 35 Gewichtsprozent Polystyrol oder Polystyrol/Butadien, etwa 40 % bis etwa 75 Gewichtsprozent Polyethylenoxid und etwa 2 % bis etwa 20 Gewichtsprozent nichtflüchtiges Kühlmittel.

9. Rasiersystem nach einem der vorgenannten Ansprüche, bei welchem das Polymer ein Blend von Polyethylenoxid umfaßt, das eine mittlere relative Molekulmasse von etwa 5 Millionen hat, sowie Polyethylenoxid umfaßt, das eine mittlere relative Molekulmasse von etwa 300.000 hat.

10. Rasiersystem nach einem der vorgenannten Ansprüche, bei welchem das Rasierhilfe-Composite zusätzlich Polyethylen glykol und/oder wasserquellfähiges Polymer aufweist.


13. Rasiersystem nach einem der vorgenannten Ansprüche, bei welchem das nichtflüchtige Kühlmittel ein solches ist, daß es, wenn es einer thermogravimetrischen Analyse unterworfen wird, bei einer Temperatur von 175 °C 50 % seines Ausgangsgewichts bewahrt.

Revidications

1. Système de rasage du type rasage humide comprenent un élément formant lame (20, 24, 60, 62) et une structure (30, 52) définissant une partie externe (32, 56) venant en contact avec la peau à proximité dudit élément formant lame, ladite partie (32, 56) venant en contact avec la peau comprenant un composite d'adjuvant de rasage (42, 64) comprenant un agent rafraîchissant, caractérisé en ce que l'agent rafraîchissant est l'on volatile.

2. Système de rasage selon la revendication 1, dans lequel le composite d'adjuvant de rasage comprend en outre un polymère insoluble dans l'eau et un polymère soluble dans l'eau lubrifiant la peau.

3. Système de rasage selon la revendication 1, dans lequel le composite d'adjuvant de rasage comprend en outre une matrice d'un polymère insoluble dans l'eau et, dispersé dans la matrice, un polymère hydrosoluble lubrifiant la peau et l'agent rafraîchissant non volatile.

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4. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel l'agent rafraîchissant non volatil est un analogue non volatil du menthol.

5. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel l'agent rafraîchissant non volatil est choisi parmi le lactate de menthylo, l'éthoxyacétate de menthylo, le glycérolacétal de menthone, le 3-1-menthoxypropyne-1,2-diol, le carbonate d'éthyle et de 1-menthyle, le (1S,3S,4R)-p-menth-8-én-3-ol, le pyrrolidone carboxylate de menthylo, le N-éthyl-p-menthane-3-carboxamide, le N,2,3-triméthyl-2-isopropylocutanamide et le glycérolacétal de l-menthene-1d-isomenthone.

6. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel le composite d'adjuvant de rasage comprend environ 15 % à environ 40 % en masse de polymère insoluble dans l'eau, environ 20 % à environ 80 % en masse de polymère hydrosoluble et environ 1 % à environ 25 % en masse d'agent rafraîchissant non volatil.

7. Système de rasage selon la revendication 6, dans lequel le polymère insoluble dans l'eau est choisi dans le groupe consistant en le polyéthylène, le polypropylène, le polystyrène, un copolymère polystyrène-butadiène, le polyacétal, un copolymère acrylonitrile-butadiène-styrène, et un copolymère éthylène-acétate de vinyle et le polymère hydrosoluble est choisi dans le groupe consistant en le poly(oxyde d'éthylène), la polyvinylpyrrolidone, le polyacrylamide, l'hydroxypropylcellulose, la polyvinylimidazoline et le polyhydroxyéthylméthacrylate.

8. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel le composite d'adjuvant de rasage comprend environ 20 % à environ 35 % en masse de polystyrène ou de polystyrène-butadiène, environ 40 % à environ 75 % en masse de poly(oxyde d'éthylène) et environ 2 % à environ 20 % en masse d'agent rafraîchissant non volatil.

9. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel le polymère hydrosoluble comprend un mélange de poly(oxyde d'éthylène) ayant une masse moléculaire moyenne d'environ 5 000 000 et d'un poly(oxyde d'éthylène) ayant une masse moléculaire moyenne d'environ 300 000.

10. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel le composite d'adjuvant de rasage comprend en outre du polyéthylèneglycol et/ou un polymère gonflable à l'eau.

11. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel l'agent rafraîchissant non volatil est un agent qui, lorsqu'il est soumis à une analyse thermogravimétrique, conserve au moins 50 % de sa masse initiale à une température de 160°C.

12. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel l'agent rafraîchissant non volatil est un agent qui, lorsqu'il est soumis à une analyse thermogravimétrique, conserve au moins 80 % de sa masse initiale à une température de 160°C.

13. Système de rasage selon l'une quelconque des revendications précédentes, dans lequel l'agent rafraîchissant non volatil est un agent qui, lorsqu'il est soumis à une analyse thermogravimétrique, conserve au moins 50 % de sa masse initiale à une température de 175°C.