

RAZOR COMPRISING A MOLDED SHAVING AID COMPOSITION COMPRISING A THERMALLY RESILIENT SENSATE

BACKGROUND OF THE INVENTION

Providing soap mounted on a razor handle or cartridge is known. For example, U.S. Patent No. 6,584,690 describes a razor that carries a shaving preparation, e.g., in the form of a solid cake of soap that surrounds the cartridge. Further 2-in-1 razors are not new and have also
5 been marketed under the Venus Breeze® line of razors and the Schick® Intuition® line of razors. See also US Patent Publ Nos. 2006/225285A and 2006/080837A, and U.S. Patent No. 7,811,553.

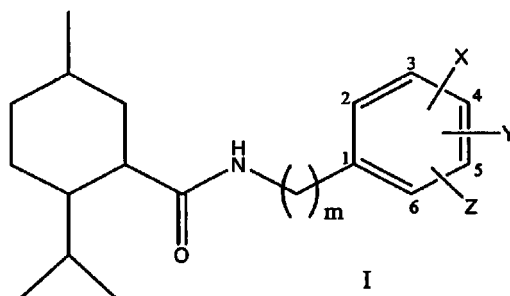
The use of shaving aids on razor blades to provide lubrication benefits during the shave is known. See e.g., U.S. Patents 7,121,754; 6,298,558; 5,711,076; 5,134,775; 6,301,785 and U.S. Patent Publ. Nos. 2009/0223057, 2006/0225285. The use of certain cooling sensates in shaving
10 aids has also been disclosed. See e.g., U.S. Patent Pubs. 2007/0077331, 2008/031166, 2008/0300314A1; U.S. Patent Nos 5,451,404, and 7,482,373; and WO2007/036814A2. For example, it has been described that cooling agents and/or essential oils can be included in the shaving aid to deliver a fresh and cool feel after contact. It has been reported, however, that a substantial amount of the essential oil can be lost due to volatilization prior to use. See U.S.
15 Patent No. 5,095,619. U.S. Patent No. 5,713,131 attempts to fix this potential problem by introducing non-volatile cooling agents into the shave aid, such as non-volatile menthol analogs. Examples of other shave aids containing menthol and other actives are disclosed in U.S. Patents 5,095,619, 6,298,558, 6,944,952, and 6,295,733. See also, U.S. Patent Nos. 5,653,971 (disclosing a shaving aid which includes an improved shaving aid composite (or lubricating strip)
20 which contains an inclusion complex of a skin soothing agent, such as menthol, with a cyclodextrin) and, 5,713,131 (disclosing a non-volatile cooling agent, such as Cooling Agent 10, WS-3, WS-23, Frescolat ML, Frescolat MGA and Menglytate). It has been reported that these shaving aids deliver cooling agent during use.

Many ingredients that are normally used in skin care, however, are not easy to use in a
25 conventional extruded or molded shaving aid. This is because many shaving aids can be extruded through a die or otherwise processed at high temperatures, such as from about 160°C to about 180°C, or they can be molded at elevated temperatures or pressures which may volatilize or otherwise negatively impact the effectiveness of the sensate. Cooling technologies have also been described in cosmetic and / or oral care formulations. See e.g. U.S. Patent Pub. Nos
30 2009/0311206 and 2009/0306152, both assigned to Beiersdorf, 2006/0276667, 2010/0086498, 2011/0081303, and 2011/0082204. Not all cooling technologies, however are suitable for

processing in normal shaving aid making conditions. In particular, some cooling technologies are believed to be so volatile that they can be lost during the shaving aid making process or otherwise become less active such that they are not perceivable during use. As such, there is a need for technologies which can survive the skin engaging shaving aid member making process while maintaining sufficient molecular activity to provide meaningful or long lasting cooling benefit.

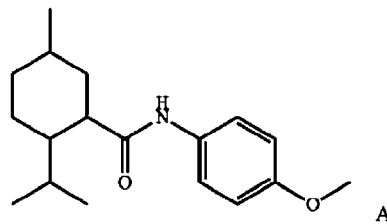
SUMMARY OF THE INVENTION

One aspect of the present invention relates to a shaving cartridge comprising: a housing having a front edge and a rear edge; one or more shaving blades between the front edge and the rear edge; a shaving aid holder; and at least one shaving aid portion mounted on the shaving aid holder, the shaving aid portion comprising an N-substituted menthanecarboxamide having the formula (I) below:



in which m is 0 or 1, Y and Z are selected independently from the group consisting of H, OH, C1-C4 straight or branched alkyl, or, a C1-C4 straight or branched alkoxy, X is (CH₂)_n-R, where n is 0 or 1 and R is a group with non-bonding electrons, with the provisos that: (a) when Y and Z are H, X is not F, OH, MeO or NO₂ in the 4-position and is not OH in the 2 or 6-position (b) when Y or Z is H then X, Y and Z are such that (i) the groups in the 3- and 4-positions are not both OMe, (ii) the groups in the 4- and 5-positions are not both OMe, (iii) the groups in 3- and 5- positions are not OMe if the group in the 4-position is OH, and (iv) the groups in the 3- and 5-positions are not OH if the group in the 4- position is methyl. The thermally resilient sensate can be included at various levels, such as from about 0.001% to about 25%, alternatively from about 1% to about 20%, alternatively from about 5% to about 15%, alternatively from about 7% to 13%, alternatively about 10%.

Another aspect of this invention relates to a skin engaging shaving aid member, i.e. suitable for use with a hair removal device, such as a razor or depilatory and scraping tool, said skin engaging shaving aid member comprising a matrix comprising at least one of: a water soluble polymer, an emollient, a soap base, and a mixture thereof; and at least one thermally resilient sensate comprising a menthane carboxylic acid-N-(4-methoxyphenyl)-amide of formula A:



This thermally resilient sensate can be included at various levels, such as from about 0.001% to about 25%, alternatively from about 1% to about 20%, alternatively from about 5% to about 15%, alternatively from about 7% to 13%, alternatively about 10%.

A further aspect of the invention relates to a hair removal device comprising one or more of the aforementioned skin engaging shaving aid members. Another aspect of the invention relates to a method of making a skin engaging shaving aid member comprising a thermally resilient sensate

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1A is a diagram of a process of forming a molded shaving aid composition utilizing a poured soap base.

FIG. 1B is a diagram of a process of forming a molded shaving aid composition utilizing an extruded soap base.

FIG. 2A is a perspective view of the head and neck portion of a razor according to one embodiment of the invention.

FIG. 2B is a perspective view of the head and neck portion shown in FIG. 1, viewed from the back.

FIG. 3 is an exploded perspective view of the razor of FIG. 1.

FIG. 4A is a perspective view of the holder portion of the cartridge shown in FIG. 1, viewed from above.

FIG. 4B is a perspective view of the holder shown in FIG. 3, viewed from below.

FIGS. 4C, 4D and 4E are, respectively, top, front, and side views of the holder shown in FIG. 3. FIG. 4F is a side view showing the wings of the holder in a deflected position (the side mounts are shown in their normal position in FIG. 3D).

FIGS. 5A, 5B, 5C, and 5D are, respectively, perspective, top, front and side views of the holder with the shaving aid portions removed.

FIGS. 6A, 6B, 6C, and 6D are, respectively, perspective, top, front and side views of the holder with the shaving aid portions and elastomeric portions removed.

Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION OF THE INVENTION

Razors having shaving aid compositions that are soap based can be used without the need for a separate shaving aid, such as, e.g., bar soap, shaving cream or gel. This can simplify razor usage, for example, by permitting shaving in the shower without the need for continued reapplication of the shaving aid to the skin. It has been recently found to be desirable to add a pyrrithione source to the shaving aid and/or the soap base to provide various benefits which will be described in more detail herein.

Generally, the shaving aid composition can be formed by first obtaining (e.g., making) a soap base, e.g., an extruded soap base or a poured soap base. Process-sensitive ingredients, which can include pyrrithione sources, can be incorporated into the soap base to form a shaving aid composition. In some instances, however, the pyrrithione source can be selected and formed such that it can be added at any point during the making of the shaving aid composition or soap base. Generally, if the soap base is a poured soap base, this is achieved by melting the poured soap base, adding the process-sensitive ingredients, and then cooling the resultant composition, for example, by placing into a mold and cooling the composition, within a period of time in which the process-sensitive ingredients remain substantially non-degraded, e.g., within about 1 hour. Where the soap base is an extruded soap base, the soap base and the process-sensitive ingredients are combined by milling, grinding, and/or other mixing techniques, refined, and extruded to form a shaving aid composition. Additionally, a good quality shaving aid composition can be achieved by avoiding remelting of the process-sensitive ingredients.

In one embodiment, the shaving cartridge comprises a housing having a front edge and a rear edge, one or more shaving blades between the front edge and the rear edge, and a shaving aid holder. The cartridges include at least one shaving aid portion mounted on the shaving aid holder. The shaving aid comprises at least one thermally resilient sensate.

I. Thermally Resilient Sensates

It is now well established that sensations such as cool or cold can be attributed to activation of receptors at peripheral nerve fibers by a stimulus such as low temperature or a chemical coolant, which produces electrochemical signals that travel to the brain, which then interprets, organizes and integrates the incoming signal(s) into a perception or sensation. Different classes of receptors have been implicated in sensing cold temperatures or chemical coolant stimuli at mammalian sensory nerve fibers. Among these receptors, a major candidate involved in sensing cold has been identified and designated as cold- and menthol-sensitive receptor (CMR1) or TRPM8. The TRPM8 nomenclature for the receptor comes from its characterization as a non-selective cation channel of the transient receptor potential (TRP) family that is activated by stimuli including low temperatures, menthol and other chemical coolants. However, the precise mechanisms underlying the perception of a pleasant cooling sensation on skin or oral surfaces are presently not clearly understood. While it has been demonstrated that the TRPM8 receptor is activated by menthol and other coolants, it is not fully understood what other receptors may be involved and to what extent these receptors need to be stimulated or perhaps suppressed in order that the overall perceived sensation would be pleasant, cooling and refreshing. Sensates have been described in various applications. *See e.g.* U.S. Patent Publ No. 2010/0086498.

The skin engaging shaving aid member of the present invention comprises at least one thermally resilient sensate. Thermally resilient sensates are defined herein as sensate ingredients which are capable of surviving conventional shaving aid (skin engaging shaving aid member) extrusion conditions but still remain sufficiently active to provide cooling or tingling sensations, typically perceptible by the user, on skin during use in a shaving context. Without intending to be bound by theory, it is believed that the thermally resilient sensate of the present invention can deliver greater cooling intensity even after it is extruded into a skin engaging shaving aid member, compared to sensates that are volatile and can be lost in the making process. In some embodiments, the thermally resilient sensate retains at least 50% of its cooling intensity compared to when it is applied onto skin at the same concentration in a liquid medium, or at least 70%, or at least 90%. Those of skill in the art will understand that skin engaging shaving aid members may also comprise hair removal or shaving aids and such skin engaging shaving aid members are also commonly referred to as lubricating strips suitable for use on the skin contacting portions of hair removal devices, especially razor cartridges.

Furthermore, the thermally resilient sensates of the present invention provide a greater cooling intensity when provided in a skin engaging shaving aid member beyond the cooling intensity of L-menthol, preferably at least 1.5 times greater cooling intensity, more preferably at

least 5 times greater cooling intensity, even more preferably at least about 10 times greater cooling intensity, up to about 20 times greater cooling intensity.

Suitable thermally resilient sensates include synthetic derivatives of cyclohexane, specifically menthane carboxylic acid-N-(4-methoxyphenyl)-amide.

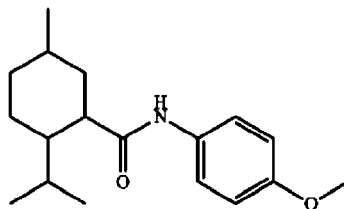
5 The at least one sensate can be included at a level of from about 0.001% to about 25%, alternatively from about 0.01% to 7.5%, alternatively from about 1% to about 20%, alternatively from about 5% to about 15%, alternatively from about 7% to 13%, alternatively about 10%. Without intending to be bound by theory, it is believed that these levels of thermally resilient
 10 sensate provide for an appreciable performance benefit to a meaningful amount of users, particularly at a level of above 5%, and at a level below 15%. It is believe that although some users may find lower levels enjoyable, many may find that there is too low impact. Similarly, although some users may enjoy a higher level above 15%, it may be too much for the majority of intended consumers. It is even believed that low levels can be useful such as the levels about 0.001%, 0.01%, 0.5%, as low as even 1%, if the total amount of sensate exposed to the skin is
 15 sufficient to provide a user perceivable cooling sensation. This can be done with soap based skin engaging shaving aid members that are larger than the conventional extruded lube strip because they cover more area and are often present forward of the blades, aft of the blades, and sometimes even around the side of the blades. In all, the increased surface area exposes more of the sensate so lower amounts by wt% can still be useful.

20 Without intending to be bound by theory, it is believed that the cooling intensities of these thermally resilient sensates are about 1.5 times the cooling intensity of L-menthol. See Leffingwell, John C. PhD, Cool without Menthol & Cooler than Menthol and Cooling Compounds as Insect Repellents (Leffingwell & Associates, Last updated May 4, 2011).

The skin engaging shaving aid member can also optionally comprise an additional coolant.

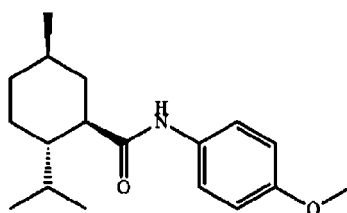
25 a. Menthane carboxylic acid-N-(4-methoxyphenyl)-amide

The thermally resilient sensate comprises a menthane carboxylic acid-N-(4-methoxyphenyl)-amide having Formula A or, preferably, Formula B, below.



Formula A

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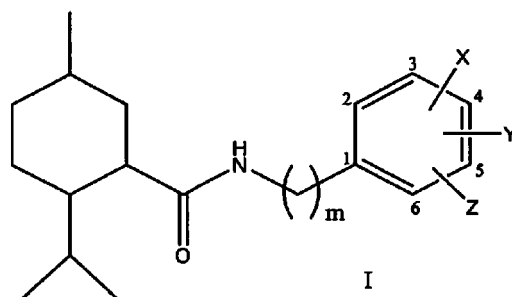


Formula B

5 Those of skill in the art will appreciate that the molecules of Formula B are a form of the molecule shown in Formula A. Non-limiting examples of such menthane carboxylic acid-N-(4-methoxyphenyl)-amides are disclosed in U.S. Patent Pub. 2011/0081303, and 2010/0086498. This material is also described under CAS#68489-09-8, may also be named
 10 (1*R**,2*S**)-*N*-(4-Methoxyphenyl)-5-methyl-2-(1-methylethyl)cyclohexanecarboxamide and is commercially available as SC1, WS-12 or Frescolat MMC by Symrise, Inc.

b. N-substituted menthane carboxamide

In some preferred embodiments, the thermally resilient sensate also comprises an N-substituted menthane carboxamide, specifically of the Formula I, below.



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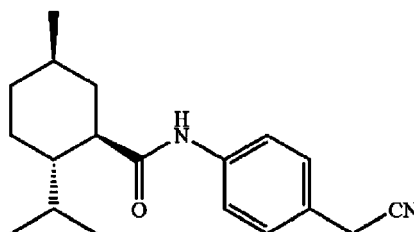
in which *m* is 0 or 1, *Y* and *Z* are selected independently from the group consisting of H, OH, C1-C4 straight or branched alkyl, or, a C1-C4 straight or branched alkoxy, *X* is (CH₂)*n*-R, where *n* is 0 or 1 and R is a group with non-bonding electrons, with the provisos that: (a) when *Y* and *Z* are H, *X* is not F, OH, MeO or NO₂ in the 4-position and is not OH in the 2 or 6-position (b)
 20 when *Y* or *Z* is H then *X*, *Y* and *Z* are such that (i) the groups in the 3- and 4-positions are not both OMe, (ii) the groups in the 4- and 5-positions are not both OMe, (iii) the groups in 3- and 5-

positions are not OMe if the group in the 4-position is OH, and (iv) the groups in the 3- and 5-positions are not OH if the group in the 4- position is methyl.

The preferred compounds are those in which X is in the 4-position. The most preferred compounds are when X is in the 4-position and Y and Z are H, OH, Me or OMe.

5 Preferred groups with non-bonding electrons are halogens, OH, OMe, NO₂, CN, Ac, SO₂NH₂, CHO, CO₂H and C1-C4 alkyl carboxylates such as CO₂Et.

On specific example of a suitable N-substituted menthanecarboxamide is N-[4-(cyanomethyl)phenyl]-(1R,2S,5R)-2-isopropyl-5-methylcyclohexanecarboxamide of Formula II.



10 Formula II

This material is also commonly referred to as N-para-benzene acetonitrile menthane carboxamide. *See e.g.* Research Disclosure RD 522003 (Givaudan), U.S. Patent Pub. Nos 2009/0311206 and 2009/0306152, both assigned to Beiersdorf, 2006/0276667, 2010/0086498, and U.S. Patent 7,414,152. Various methods to manufacture N-para-benzene acetonitrile menthane carboxamide have been disclosed, including in U.S. Patent Publ. 2006/027667, 15 2008/0300314, 2010/0040563, and 2010/0076080. N-para-benzene acetonitrile menthane carboxamide is commercially available from suppliers under CAS 852379-28-3, which can be supplied as a white powder with an assay of 94% to 100% and a melting point of 145°C at 760 mm Hg.

In these preferred embodiments, the skin engaging shaving aid member comprises more 20 than one thermally resilient sensate: a mixture of N-substituted menthanecarboxamide and menthane carboxylic acid-N-(4-methoxyphenyl)-amide, which it is believed provides improved cooling sensation properties, e.g. better instantaneous and lasting cooling and superior cooling overall. These two coolants may be combined at a ratio from about 25:1 to about 1:25 of N-substituted menthanecarboxamide to menthane carboxylic acid-N-(4-methoxyphenyl)-amide, 25 alternatively from about 10:1 to about 1:10, alternatively from about 3:1 to about 1:3.

Without intending to be bound by theory, it is believed that N-substituted menthanecarboxamide triggers both TRPM8 and TRPA1 (Tingle/numb/burn) receptor, while menthane carboxylic acid-N-(4-methoxyphenyl)-amide triggers only the cooling receptor

TRPM8, and L-menthol triggers TRPM8, TRPA1 and warming receptors TRPV1 & TRPV3. It is thus believed that the a system comprising one or both of the synthetic derivatives of cyclohexane described above, with the option of containing additional sensates makes it possible to achieve in-shave and long-last cooling benefits.

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c. Additional Sensates

In some embodiments, the skin engaging shaving aid member further comprises one or more additional sensates other than the thermally resilient sensates disclosed above. For example, menthol is widely used as a cooling agent, but menthol can also produce other
10 sensations including tingling, burning, prickling and stinging as well as a minty smell and bitter taste. Thus, it can be inferred that menthol acts on many different receptors, including cold, warm, pain and taste receptors. However, it is not readily discernible how to isolate which receptor activities would result in a specific sensation such as pleasant cooling without the undesirable sensations such as bitterness or irritation. Neither is it apparent how to control the
15 activity of coolants or other sensory agents such that only the desired sensation is elicited from use of a particular sensory agent. As such, the present invention is focused on the addition of specific synthetic derivatives of cyclohexane (described above) to act as sensates to deliver cooling benefit to users during the hair removal process. Additional sensates can be used to further supplement the cooling feel.

20 A large number of coolant compounds of natural or synthetic origin are known. The most well-known compound is menthol, particularly l-menthol, which is found naturally in peppermint oil, notably of *Mentha arvensis* L and *Mentha viridis* L. Of the isomers of menthol, the l-isomer occurs most widely in nature and is typically what is referred by the name menthol having coolant properties. L-menthol has the characteristic peppermint odor, has a clean fresh taste and
25 exerts a cooling sensation when applied to the skin and mucosal surfaces. Other isomers of menthol (neomenthol, isomenthol and neoisomenthol) have somewhat similar, but not identical odor and taste, i.e., some having disagreeable notes described as earthy, camphor, musty. The biggest difference among the isomers is in their cooling potency. L-menthol is reported to provide the most potent cooling, i.e., having the lowest cooling threshold (i.e., the concentration
30 where the cooling effect could be clearly recognized) of about 800 ppb. At this level, there is no cooling effect for the other isomers. For example, d-neomenthol is reported to have a cooling threshold of about 25,000 ppb and l-neomenthol about 3,000 ppb. [R. Emberger and R. Hopp, "Synthesis and Sensory Characterization of Menthol Enantiomers and Their Derivatives for the Use in Nature Identical Peppermint Oils," Specialty Chemicals (1987), 7(3), 193-201]. This

study demonstrated the outstanding sensory properties of l-menthol in terms of cooling and freshness and the influence of stereochemistry on the activity of these molecules.

Among synthetic coolants, many are derivatives of or are structurally related to menthol, i.e., containing the cyclohexane moiety, and derivatized with functional groups including carboxamide, ketal, ester, ether and alcohol. Examples include the p-menthanecarboxamide compounds such as N-ethyl-p-menthan-3-carboxamide, known commercially as "WS-3", and others in the series such as WS-5 (N-ethoxycarbonylmethyl-p-menthan-3-carboxamide), and WS-14 (N-tert-butyl-p-menthan-3-carboxamide). Examples of menthane carboxy esters include WS-4 and WS-30. An example of a synthetic carboxamide coolant that is structurally unrelated to menthol is N,2,3-trimethyl-2-isopropylbutanamide, known as "WS-23". Additional examples of synthetic coolants include alcohol derivatives such as 3-(1-menthoxy)-propane-1,2-diol known as TK-10, isopulegol (under the tradename Coolact P) and p-menthane-3,8-diol (under the tradename Coolact 38D) all available from Takasago; menthone glycerol acetal known as MGA; menthyl esters such as menthyl acetate, menthyl acetoacetate, menthyl lactate known as Frescolat® supplied by Haarmann and Reimer, and monomenthyl succinate under the tradename Physcool from V. Mane. TK-10 is described in U.S. Pat. No. 4,459,425 to Amano et al. Other alcohol and ether derivatives of menthol are described e.g., in GB 1,315,626 and in U.S. Pat. Nos. 4,029,759; 5,608,119; and 6,956,139. WS-3 and other carboxamide cooling agents are described for example in U.S. Pat. Nos. 4,136,163; 4,150,052; 4,153,679; 4,157,384; 4,178,459 and 4,230,688. Additional N-substituted p-menthane carboxamides are described in WO 2005/049553A1 including N-(4-cyanomethylphenyl)-p-menthanecarboxamide, N-(4-sulfamoylphenyl)-p-menthanecarboxamide, N-(4-cyanophenyl)-p-menthanecarboxamide, N-(4-acetylphenyl)-p-menthanecarboxamide, N-(4-hydroxymethylphenyl)-p-menthanecarboxamide and N-(3-hydroxy-4-methoxyphenyl)-p-menthanecarboxamide. Other N-substituted p-menthane carboxamides include amino acid derivatives such as those disclosed in WO 2006/103401 and in U.S. Pat. Nos. 4,136,163; 4,178,459 and 7,189,760 such as N-((5-methyl-2-(1-methylethyl)cyclohexyl)carbonyl)glycine ethyl ester and N-((5-methyl-2-(1-methylethyl)cyclohexyl)carbonyl)alanine ethyl ester. Menthyl esters including those of amino acids such as glycine and alanine are disclosed e.g., in EP 310,299 and in U.S. Pat. Nos. 3,111,127; 3,917,613; 3,991,178; 5,5703,123; 5,725,865; 5,843,466; 6,365,215; 6,451,844; and 6,884,903. Ketal derivatives are described, e.g., in U.S. Pat. Nos. 5,266,592; 5,977,166 and 5,451,404. Additional agents that are structurally unrelated to menthol but have been reported to have a similar physiological cooling effect include alpha-keto enamine derivatives described in U.S. Pat. No. 6,592,884 including 3-methyl-2-(1-pyrrolidinyl)-2-cyclopenten-1-one (3-MPC), 5-

methyl-2-(1-pyrrolidinyl)-2-cyclopenten-1-one (5-MPC), and 2,5-dimethyl-4-(1-pyrrolidinyl)-3(2H)-furanone (DMPF); icilin (also known as AG-3-5, chemical name 1-[2-hydroxyphenyl]-4-[2-nitrophenyl]-1,2,3,6-tetrahydropyrimidine-2-one) described in Wei et al., *J. Pharm.*

Pharmacol. (1983), 35:110-112. Reviews on the coolant activity of menthol and synthetic coolants include H. R. Watson, et al. *J. Soc. Cosmet. Chem.* (1978), 29, 185-200 and R. Eccles, *J. Pharm. Pharmacol.*, (1994), 46, 618-630.

II. Pyrithione Source

In one embodiment, the soap base used for the shaving aid can also include from about 45% to about 99% of a soap and from about 0.01% to about 5% a pyrithione source. The pyrithione source can be zinc pyridinethione, referred to as zinc pyrithione or ZPT, and can even be in the form of a platelet. The platelet ZPT has a median particle diameter of about 0.5 microns to about 10, alternatively about 1 to about 5 microns, and alternatively about 3 microns; a mean particle diameter of about 0.5 to about 10 microns, alternatively about 1 to about 5 microns, alternatively about 2 to about 4 microns, and alternatively about 3 microns, and a thickness of about 0.6 to about 15 microns, alternatively about 0.6 to 1 micron, alternatively about 0.6 to about 0.8, and alternatively about 0.6 to about 0.7 microns. The platelet ZPT can also have a span of less than about 5, or about 1.

As used herein, the pyrithione source can be a pyrithione and a pyrithione salt capable of providing antimicrobial efficacy and/or other aesthetic and shave benefits. Preferred pyrithione salts are those formed from heavy metals such as zinc, tin, cadmium, magnesium, aluminum and zirconium. Zinc salts are most preferred, especially the zinc salt of 1-hydroxy-2-pyridinethione (zinc pyridinethione, also named zinc pyrithione, ZPT). Other cations such as sodium may also be suitable. The pyrithione source may be selected from the group consisting of sodium pyrithione, zinc pyrithione, magnesium disulfide pyrithione, pyrithione acid, dipyrithione, chitosan pyrithione and combinations thereof. For example, ZPT FPS available from Arch Chemical can be used. It is an aqueous dispersion comprising 48% active ZPT.

Pyrithione sources are well known in the personal cleansing art, and are described, for example, in US patent 2,809,971; US patent 3,236,733; US patent 3,753,196; US patent 3,761,418; US patent 4,345,080; US patent 4,323,683; US patent 4,379,753; and US patent 4,470,982. Descriptions about pyrithione sources in the above mentioned patents are incorporated herein by reference. The pyrithione source can be present in the shaving aid composition in an amount ranging from about 0.05%, 0.1% or 0.4% to about 0.5%, 1%, 2% or 5% by weight.

In one embodiment, the zinc pyrithione included in soap base is dry powder zinc pyrithione in platelet particle form ("platelet ZPT"). According to example embodiments, the platelet ZPT included in the soap base composition can include particles with, for example, a median particle diameter of about 0.5 microns to about 10, alternatively about 1 to about 5 microns, and alternatively about 3 microns and a mean particle diameter of about 0.5 to about 10 microns, alternatively about 1 to about 5 microns, alternatively about 2 to about 4 microns, and alternatively about 3 microns. The platelet ZPT can also have a thickness of about 0.6 to about 15 microns, alternatively about 0.6 to about 1 micron, alternatively about 0.6 microns to about 0.8 microns, and alternatively about 0.6 microns to about 0.7 microns as shown in FIG. 1 of U.S. Patent Serial No. 13/036,889, Smith et al. filed on February 28, 2011, Application Docket No. 12005. The platelet ZPT included in the shaving aid can also have a span of less than about 5, and alternatively about 1.

The shaving aid can include from about 0.01% to about 5%, by weight of the bar composition, of platelet ZPT, alternatively from about 0.1% to about 2%, and alternatively from about 0.1% to about 1%. The platelet ZPT can be included in the shaving aid as a dry power that is, for example, dispersed with the soap ingredients. Alternatively, the platelet ZPT can be included in the shaving aid as aqueous dispersion with, for example, in the soap base.

In one embodiment, the platelet ZPT can be stabilized against, for example, flocculation. In one embodiment, each of the platelet ZPTs can have a coating or layer thereon to prevent the platelet ZPTs from attaching to each other. The coating or layer can be polynaphthalene sulfonate or any other suitable sulfate, sulfonate, carboxylate, or other compound that provides stability for example by charge or steric barrier.

In example embodiments, the ZPT can be made by reacting 1-hydroxy-2-pyridinethione (i.e., pyrithione acid) or a soluble salt thereof with a zinc salt (e.g. zinc sulfate) to form a zinc pyrithione precipitate as illustrated in U.S. Patent No. 2,809,971 and the zinc pyrithione can be formed or processed into platelet ZPT using, for example, sonic energy as illustrated in U.S. Patent No. 6,682,724.

III. Soap Base

The shaving aid composition includes a soap base, e.g., a poured soap base or an extruded soap base. The basic component of the soap base can be a vegetable oil or tallow, saponified or neutralized to form the base, or can be a synthetic poured soap base. Super-fatted materials containing portions (e.g., greater than about 25 weight percent) of coconut acid or other fatty acids may also be used. In some embodiments, the shaving aid composition includes a base

comprising a vegetable oil or a tallow or the like, or a combination of the foregoing materials, which is saponified or neutralized. The saponification or neutralization of the vegetable oil or tallow results in the production of glycerol and salts of fatty acids to form the base. The shaving aid composition can include about 50 wt% to about 100 wt % saponified or neutralized base (e.g., about 75 wt% to about 100 wt% saponified or neutralized base), which may be opaque, translucent, or transparent. Exemplary salts of fatty acids that may be produced include sodium carboxylate salts having up to about 22 carbon atoms.

The soap base can be a synthetic soap base. In certain embodiments, the synthetic soap base includes a glycol (e.g., dipropylene glycol, propylene glycol, tripropylene glycol, and/or methylpropane diol glycol), glycerin, fatty acid salts (e.g., sodium stearate and/or potassium stearate), C15-C25 alcohols (e.g., behenyl alcohol, stearyl alcohol, cetyl alcohol, and/or myristic alcohol), steareth (e.g., a steareth 21 such as, for example, Brij®-721), stearic acid, microcrystalline wax (e.g., microcrystalline wax SP 16, SP 19, SP 16, SP 18, SP-1674, SP 16W, SP 60W, SP 89, Multiwax 180M, X-145, W-445, and/or W-835), one or more surfactants (e.g., Tegobetaine F-50, Lonzaine®, the Mackam® family of surfactants, the Mirataine® family of surfactants, and sodium lauryl ether sulfate ("SLES") (e.g., 25% active SLES). In some embodiments, glycerin is not included in the soap base. Glycerin can optionally be included, in part or in whole, in a process sensitive phase described in greater detail below.

The soap base can, in certain embodiments, include from about 0.5% to about 30% glycol (e.g., from about 10% to about 25% glycol or from about 12% to about 15% glycol), from about 10% to about 40% glycerin (e.g., from about 18% to about 34% glycerin or from about 18% to about 24% glycerin), from about 20% to about 40% fatty acid salt (e.g., from about 25% to about 40% fatty acid salts (e.g., stearate) or from about 30% to about 35% fatty acid salt), from about 0.1% to about 10% stearic acid (e.g., from about 2 to about 5% stearic acid), from about 0.5% to about 10% microcrystalline wax (e.g., from about 0.5% to about 5% microcrystalline wax or from about 1% to about 3% microcrystalline wax), from about 1% to about 15% betaine (e.g., from about 2% to about 10% active betaine or from about 4% to about 9% active betaine), and from about 1 to about 20% active SLES (e.g., from about 1% to about 20% active SLES or from about 10% to about 15% active SLES), all based on the weight of the poured soap base. One exemplary poured soap base prior to addition of the thermally resilient sensate includes the following:

Dipropylene glycol	17.2%
Glycerin	21.4%
Sodium stearate	34.4%

Stearic acid (Pristerene® 4980)	3.7%
Microcrystalline wax SP 89	1.2%
Tegobetaine F-50	7.4%
SLES, 25% active	14.7%

5 In some embodiments, a combination of base and synthetic surfactants can be employed.

Additional Antibacterial Agents

The soap base can optionally further include one or more additional antibacterial agents that can serve to further enhance the antimicrobial effectiveness of the bar compositions. When present, the antimicrobial bar composition can include from about 0.001% to about 2%,
 10 preferably from about 0.01% to about 1.5%, more preferably from about 0.1% to about 1%, by weight of the antimicrobial bar composition. Examples of antibacterial agents that can be employed are the carbanilides, for example, triclocarban (also known as trichlorocarbanilide), triclosan, a halogenated diphenylether available as DP-300 from Ciba-Geigy, hexachlorophene, 3,4,5-tribromosalicylanilide, and salts of 2-pyridinethiol-1-oxide, salicylic acid and other organic
 15 acids. Other suitable antibacterial agents are described in detail in US 6,488,943 (referred to as antimicrobial actives).

pH and pH Adjusting Agents

In one embodiment, the pH of the present soap base is greater than or equal to 10.7, preferably greater than or equal to 11, 11.5, 12, 12.5, 13, and 13.5, till up to 14. As used herein,
 20 pH of the present composition is measured at around 25°C using any commercially available pH meter. When the tested composition is in a solid form, it is first dissolved in distilled water to form an aqueous solution of a concentration of 10%. The pH of this aqueous solution is then tested to be representative of the soap base.

In one embodiment, the present soap base comprises a pH adjusting agent in a sufficient
 25 amount to attain the above mentioned pH. The pH adjusting agents useful for the present composition includes alkalizing agents. Suitable alkalizing agents include, for example, ammonia solution, triethanolamine, diethanolamine, monoethanolamine, potassium hydroxide, sodium hydroxide, sodium phosphate dibasic, soluble carbonate salts, ammonia solution, triethanolamine, diethanolamine, monoethanolamine, potassium hydroxide, sodium hydroxide,
 30 sodium phosphate dibasic, soluble carbonate salts and combinations thereof.

The amount of the pH adjusting agent required to attain the requisite pH can be calculated by one skilled in the art following known chemical parameters, for example, pKa value of the pH adjusting agent.

In one embodiment of the present invention, the present soap base comprises a soluble carbonate salt presented in an amount effective to attain a pH of greater than or equal to 10.7 to decrease discoloration. Soluble carbonate salts may include those carbonates and bicarbonates that have a solubility of greater than or equal to 0.01g in water at 20°C. Such carbonates can be selected from a group consisting of sodium carbonate, potassium carbonate, ammonium carbonate, aluminum carbonate, magnesium carbonate, sodium bicarbonate, potassium bicarbonate, ammonium bicarbonate and combinations thereof.

In another embodiment, the present composition comprises a soluble carbonate salt in an amount effective to prevent discoloration. For example, soluble carbonate salt is present in the present composition in an amount ranging from about 0.3%, 0.5%, 0.8%, 1% or 1.5% to about 2%, 2.5%, 5%, 10% or 20%.

In one embodiment where the soap base comprises a pyrrithione source and a soap surfactant, the soap base can also comprise a pH adjusting agent selected from a group consisting of ammonia solution, triethanolamine, diethanolamine, monoethanolamine, potassium hydroxide, sodium hydroxide, sodium phosphate dibasic, soluble carbonate salts and combinations thereof, wherein the soap attains a pH of greater than or equal to 10.7. This soap base shows a decreased discoloration and comparative examples are provided in Fig 1 of PCT China Patent Serial No. CN2011/000320, Smith et al. filed on February 28, 2011, Application Docket No. AA00812F. Without being bound by theory, it is believed that by increasing the pH, a configuration change of the pyrrithione group happens, making the pyrrithione group tend not to react with the dissolved ferric or cupric ions to form colored precipitates, thereby inhibiting or decreasing discoloration.

IV. Methods of Making the Molded Shaving Aid Composition

Multi-step process

In one embodiment, the shaving aid is molded and can be formed by a multi-step process, such as generally described in U.S. 7,811,553 at col. 8, line 60 – col. 11, line 6. In short the two step process can include a first step of forming a poured soap base.

The poured soap base can be a tallow or vegetable-based soap base, a synthetic soap base, or a combination of these. In certain embodiments, the process of forming the soap base includes elevating the soap base ingredients to a temperature of no less than about 80°C (e.g., no less than about 85°C, 90°C, 95°C, 100°C, or 105°C). The soap base ingredients are in some embodiments subjected to these temperatures for a period of time no less than about 1 hour (e.g., no less than about 2, 3, 4, 5, 10, or no less than about 20 hours). The thermally resilient sensate can be added with the soap base, and/or afterwards along with any process sensitive ingredients.

In a second step, a second phase is prepared, which can include one or more of the ingredients that are process-sensitive, such as certain pyrithione sources, the esters, the polyoxyethylene, fragrances, dyes, and other optional ingredients. The second phase can be prepared by warming glycerin to a temperature of from about 25°C to about 50°C (e.g., to about 35°C) and adding any process-sensitive ingredients. The elevated temperature can aid in the incorporation of these ingredients, and can be selected on the basis of the particular ingredients that are being incorporated. For example, butters typically melt at about 35°C, so raising the temperature of the second phase to about 35°C can aid in melting the butters into the phase. The selection of ingredients and amounts of the ingredients selected will vary, depending on the levels desired in the final shaving aid composition. In some embodiments, ingredients that are not themselves process-sensitive can be included in the second phase. The temperature of the second phase can in certain embodiments be maintained at from about 25°C to about 50°C (e.g., at about 35°C) until such time as the second phase is added to the soap base. In other embodiments, the second phase can be allowed to cool (e.g., to room temperature) prior to being incorporated into the soap base. In one embodiment, the thermally resilient sensate is added into the second phase. It can be advantageous to add it during the second phase as the first phase can be stored for long hold times at elevated temperatures, such as for 20 to 96 hours at temperatures up to 95°C. In this way, addition of the thermally resilient sensate can be optionally included in later product differentiation steps which the second phase accommodates.

In another embodiment, the thermally resilient sensate is added during the amalgamation step when extruding the soap.

As a third step, a shaving aid composition can be formed from the mixture of the soap phase and a second phase is illustrated in FIG. 1. A solidified poured soap base 202 is heated to a temperature of from about 90°C to about 100°C (e.g., to about 91°C, about 92°C, about 93°C, about 94°C, about 95°C, about 96°C, about 97°C, about 98°C, about 99°C, or about 100°C) and remelted to form a melted soap 204. The melted soap 204 is metered via a pump 206 into a heated filler feed vessel 210 that is equipped with a stirring mechanism 212. Filler feed vessel 210 is configured to maintain the temperature of its contents at about 95°C. A second phase 220 is formed by intermixing the process-sensitive ingredients 224 in heated chamber 222. The second phase 220 is then metered via pump 228 into the filler feed vessel 210 and intermixed with the soap base 202 to form a molten shaving aid composition 230.

The molten shaving aid composition 230 is then metered via fill pumps 232 into individual molds 236 formed in a mold block 238, where the shaving aid composition is cooled to form molded shaving aid compositions 240. The temperature of the molten shaving aid

composition 230 is maintained at a temperature of about 95°C until the shaving aid composition is placed in the molds 236.

Because the molten shaving aid composition 230 can include process-sensitive ingredients 224, the molten shaving aid composition 230 is held at the elevated temperature for a period of time that is less than would result in substantial degradation of the process-sensitive ingredients 230. For example, in some embodiments, the molten shaving aid composition 230 is held at an elevated temperature for no more than about 120 minutes (including e.g., no more than about 110 minutes, no more than about 100 minutes, no more than about 90 minutes, no more than about 75 minutes, no more than about 60 minutes, no more than about 50 minutes, no more than about 40 minutes, no more than about 30 minutes, no more than about 20 minutes, no more than about 10 minutes, no more than about 5 minutes, or even no more than about 2 minutes) before it is placed into molds and cooled. In this fashion, a molded shaving aid composition can be formed in which the process sensitive ingredients are substantially non-degraded. As explained above, it can be advantageous to add any thermally resilient sensates downstream of this storing step.

In certain embodiments, the shaving aid composition is placed into a mold having a shaving aid mounting device (e.g., the wings described below) already positioned in the mold. In this fashion, the shaving aid composition can embed itself into the shaving aid mounting device upon solidifying.

Once the shaving aid composition has cooled to a sufficient point (e.g., to the point that it has solidified enough to be easily separated from the mold), the shaving aid composition can be removed from the mold. In some embodiments, the shaving aid composition is allowed to cool to approximately room temperature before being removed from the mold. In other embodiments, the shaving aid composition is allowed to cool to a temperature no greater than about 80°C (e.g., no greater than about 75°C, 70°C, 65°C, 60°C, 50°C, 40°C, no greater than about 30°C, no greater than about 25°C, no greater than about 20°C, no greater than about 15°C, no greater than about 10°C, no greater than about 5°C, or no greater than about 0°C) before being removed from the mold.

One-step batch process

In some embodiments, the pyrrithione source and any process-sensitive ingredients can be added directly to the poured soap base melt in a one-step batch process. In one such embodiment, the poured soap base melt is maintained at about 95°C, and the second phase is added to the melt to form the shaving aid composition without first cooling and then re-melting the poured soap base melt. The shaving aid composition is then placed into one or more molds

and cooled. In another such embodiment, the process sensitive ingredients are mixed directly into the poured soap base melt without first being incorporated into a process sensitive phase. The resulting shaving aid composition is then placed into one or more molds and cooled. In each case, the composition is placed in molds and allowed to cool before enough time has elapsed to substantially degrade some or all of the process sensitive ingredients. In particular, the time that elapses between adding the process-sensitive ingredients to the melted soap base and placing the molten shaving aid composition into the molds and cooling the shaving aid composition should be less than an amount of time in which some or all of the process-sensitive ingredients typically would begin to degrade at the elevated temperature and shear of the intermixing step. Generally, this time will be less than about 90 minutes (e.g., less than about 80, 70, 60, 50, 40, 30, 20, 10, or less than about 5 minutes).

Continuous process

In some embodiments, the molded shaving aid composition is prepared in a continuous process. The ingredients for the soap base are first combined and flowed through a heated chamber to increase the temperature of the ingredients to at least about 90°C (e.g., at least about 95°C, 100°C, 105°C, 110°C, 115°C, or at least about 120°C). The heated chamber and pumping mechanism are configured to permit a sufficient dwell time of the soap base components at the elevated temperature to allow for sufficient melting and intermixing of the ingredients.

Next, the melt is moved into a second chamber maintained at no more than about 100°C (e.g., no more than about 90°C, no more than about 80°C, or no more than about 70°C). In the alternative, the melt can be retained in the first chamber, and the temperature of the first chamber can be reduced to no more than about 100°C (e.g., no more than about 90°C, no more than about 80°C, or no more than about 70°C). While maintaining this temperature, the process-sensitive ingredients are introduced and mixed into the soap base melt to form the shaving aid composition. The ingredients can be introduced individually, or can be introduced in the form of process sensitive phase, which is described above. The shaving aid composition is then flowed into a mold, e.g., by injection molding, and cooled to form a molded shaving aid composition.

Extruded Soap

An extruded soap can be employed in certain embodiments. A process 250 for forming an extruded soap is illustrated in FIG. 1B. The soap base is generally formed by combining the soap base ingredients 252 in a reaction vessel 254 to form a liquid soap base 256 (e.g., by saponification or neutralization reaction) and glycerine 258, which is removed from the liquid soap base 256. The liquid soap base is moved to a drying chamber 260 where at least some of the water is removed (e.g., by vacuum spray drying) to form substantially dry soap pellets 262

(e.g., dry soap noodles or shavings). The dry soap pellets 262 are then introduced into an amalgamator 264 having one or more paddles 266 for mixing and/or grinding the dry soap pellets 266 along with process sensitive ingredients 270, which are introduced into the amalgamator 264, to form an extruded soap dry blend 272. The extruded soap dry blend 272 can in some
5 embodiments be macromolecularly homogenized (e.g., a substantially even distribution of the process-sensitive ingredients among the dry soap pellets can be achieved). The extruded soap dry blend 272 is then refined, e.g., by introducing the extruded soap dry blend 272 into one or more rolling mills 274 to achieve a substantially uniform texture. The extruded soap dry blend 272 is then extruded using an extruder 276, optionally using heat (e.g., not more than 95°C,
10 90°C, 85°C, 80°C, 70°C, 60°C, 50°C, 40°C, 30°C, or not more than 25°C) and/or pressure, to form a continuous bar of extruded soap 278, which can be subjected to further processing steps 278 (e.g., cutting and/or stamping into the desired final shape).

V. Other Ingredients in the Shaving Aid Composition

15 Wear Enhancers

The shaving aid composition includes one or more wear enhancing ingredients. Suitable wear enhancing ingredients include sodium stearate, polyoxyethylene, polyethylene, esters, and silicone polymers. Many of these ingredients (e.g., esters and polyoxyethylene) are typically process-sensitive. Wear enhancing materials can also impart other qualities or characteristics to
20 the shaving aid composition, such as, e.g., increased lubrication.

Polyoxyethylene

One suitable wear enhancing ingredient is polyoxyethylene, which is a process-sensitive material. Polyoxyethylenes are typically characterized by their nominal, or average (number average), molecular weight. The number average molecular weight is the sum of individual
25 molecular weights divided by the number of polymers. As is known in this field, a sample of polyoxyethylene generally includes a distribution of molecular weights such that the sample will include individual polymer molecules above and below the number average molecular weight.

Inclusion of a polyoxyethylene of any nominal molecular weight can improve the wear characteristics of the molded shaving aid composition. The polyoxyethylene can have an
30 approximate nominal molecular weight of, for example, no less than about 100,000 daltons (e.g., no less than about 500,000, 1,000,000, 2,000,000, 3,000,000, 4,000,000, 5,000,000, 6,000,000, or no less than about 7,000,000 daltons) and/or no more than about 8,000,000 daltons (e.g., no more than about 7,000,000, 6,000,000, 5,000,000, 4,000,000, 3,000,000, 2,000,000, or no more than about 1,000,000 daltons). Optionally, two or more polyoxyethylenes having different nominal

molecular weights can be employed. The polyoxyethylene can be present, for example, at a level of no less than about 0.1% (e.g., no less than about 0.25%, no less than about 0.5%, no less than about 1%, no less than about 2%, no less than about 3%, no less than about 4%, no less than about 5%, no less than about 6%, no less than about 7%, no less than about 8%, or no less than about 9%) and/or no more than about 10% (e.g., no more than about 9%, no more than about 8%, no more than about 7%, no more than about 6%, no more than about 5%, no more than about 4%, no more than about 3%, no more than about 2%, no more than about 1%, or no more than about 0.5%), based on the weight of the shaving aid composition. Exemplary polyoxyethylenes include members of the POLYOX[®] family of polyoxyethylenes, available from Union Carbide Corp, and ALKOX[®] polyoxyethylenes, available from Meisei Chemical Works, Kyoto, Japan.

Silicone Polymers

Silicone polymers can also be employed as a wear enhancing ingredient. In particular, silicone cross-polymers may be used. Silicone cross-polymers are polymers including silicone (e.g., having a silicone-based backbone) that are capable of cross-linking (e.g., that are cross-linked). Silicone polymers, particularly silicone cross-polymers, can be present at levels of at least about 0.25% active in a solvent (e.g., at least about 0.5%, 1%, 1.5%, 2%, 2.5%, 3%, 3.5%, 4%, or at least about 4.5%) and/or at most about 5% (e.g., at most about 4.5%, 4%, 3.5%, 3%, 2.5%, 2%, 1.5%, 1%, or at most about 0.5%). In certain embodiments, the silicone cross-polymer will be present at levels of from about 0.25% to about 5%. Exemplary silicone cross-polymers include, for example, lauryl dimethicone/polyglycerin-3 cross-polymer (e.g., 30% lauryl dimethicone/polyglycerin-3 cross-polymer). Commercially available silicone cross-polymers are known and are disclosed in US 7811553 at col. 6.

Esters

Esters (for example, butters and other non-liquid esters) can be incorporated into the shaving aid composition, and can function as a wear enhancer and/or as a skin-softener. In particular, semi-solid esters may be employed and they are generally process-sensitive materials. The semi-solid esters can act as an emollient and/or as a moisturizer. Exemplary semi-solid esters include butters such as, for example, shea butter, cocoa butter, kokum butter, avocado butter, olive butter, mango butter, and mixtures thereof. Esters can be incorporated into the shaving aid composition in levels of no less than about 0.5% (e.g., no less than about 1%, 2%, 3%, 4%, 5%, 6%, or no less than about 7%) and/or no more than about 8% (e.g., no more than about 7%, 6%, 5%, 4%, 3%, 2%, or no more than about 1%).

Polyethylene Compositions

The shaving aid composition can include one or more polyethylene compositions as wear enhancing ingredients. Generally, polyethylenes can improve the wear characteristics of the shaving aid composition, but are difficult to incorporate into the composition directly. Instead, the polyethylenes can be incorporated into a composition that is then incorporated into the shaving aid composition. For example, a composition including polyethylene, polybutene, and mineral oil (for example, sold under the trade name Covagloss by Sensient Technologies) can be employed. In some embodiments, the shaving aid composition will include no less than about 0.5% (e.g., no less than about 1%, 2%, 3%, 4%, 5%, 6%, or no less than about 7%) and/or no more than about 8% (e.g., no more than about 7%, 6%, 5%, 4%, 3%, 2%, or no more than about 1%) of a polyethylene, polybutene, and mineral oil composition.

Moisturizer Components and Other Optional Ingredients

The shaving aid composition can further include other skin care ingredients and/or other additives. Skin care ingredients that may be added to the base to enhance the composition include, but are not limited to, surfactants (e.g., sodium isostearoyl lactylate, ammonium isostearate, DEA-myristate, alkyl glyceryl sulfonate, and laureth-16), skin care agents such as petrolatum (e.g., emollients, lubricants, humectants, moisturizing agents, and conditioners), foaming agents, hair growth inhibitors, botanical extracts, antioxidants, antimicrobials, anti-inflammatory agents, astringents, anti-irritants, depilatory agents, medicinal agents, absorbants, fragrances, coloring agents (e.g., dyes and pigments) and exfoliating agents (e.g., loofa, seaweed, oatmeal, pumice, apricot seed, and the like). Exemplary embodiments of skin care agents include, but are not limited to, humectants such as glycerin, sorbitol, and propylene glycol, skin freshening and soothing agents such as menthol, aloe, allantoin and collagen, lubricants such as polyoxyethylene, and silicones (e.g. dimethicone, dimethiconol, dimethicone copolyol, stearyl dimethicone, cetyl dimethicone copolyol, phenyl dimethicone, cyclomethicone, etc.), sodium or potassium salts (e.g., lactylates, chlorides, sulfonates, and the like), vitamins and vitamin complexes (including vitamin precursors and derivatives), cocoates, metal oxides, oils (e.g., cocoa butter), dimethicone, allantoin, sucrose cocoate, oleyl lanolate, thiourea, tocopheryl acetate, PPG-33, undeceth-3, honey, algae and aloe barbadensis. The skin care ingredients can in some embodiments be present in amount of no more than about 35% (e.g., no more than about 30%, 25%, 20%, 15%, 12%, 10%, 8%, 6%, 4%, or no more than about 2%). The absorbents can be clays or clay-based compositions, kaolin, wood powder, sodium chloride, cyclodextrin, chalks, talcs, silicas, polytetrafluoroethylene, or the like, and can be present in amounts of no

more than about 9% (e.g., no more than about 5% or no more than about 3%). Clays that may be added include bentonite, kaolin, combinations of the foregoing clays, and the like.

Exemplary coloring agents include dyes and pigments, for example, titanium dioxide, manganese violet, zinc oxide, an Ultramarine (e.g., Ultramarine Blue 4), Orange 4, Green 3, or other dyes or pigments approved for use in cosmetics, either alone or in combination. Coloring agents can in certain embodiments be added in an amount of no more than about 6% (e.g., no more than about 4 %, 2%, 1%, 0.1%, 0.01%, 0.001%, 0.0001%, or even no more than about 0.00001%) and/or no less than about 0.000001% (e.g., no less than about 0.00001%, 0.0001%, 0.001%, 0.01%, 0.1%, or no less than about 1%) by weight.

Fragrances are odorants used to impart desirable smells to the composition and may further mask the less desirable odors of other components of the composition. Any fragrance approved for use in cosmetics may be employed. In certain embodiments, at least one fragrance ingredient can be added in an amount up to about 4% (e.g., up to about 2%, up to about 1.5% or up to about 1%).

An exemplary process sensitive phase includes the following:

Glycerin	62.4%
Shea butter	5.4%
Fragrance (IFF 4473-BH)	5.4%
POLYOX® WSR coagulant (MW approximately 5 million)	26.9%
D&C Red 33 Dye	0.005%

Wear Characteristics of the Shaving Aid

In some embodiments, the shaving aid composition exhibits good wear characteristics. Wear characteristics can be determined in a number of ways. For example, the shaving aid composition can be incorporated onto a razor, and the number of shaves before certain shaving performance characteristics begin to degrade can be determined. In other embodiments, the wear can be determined by subjecting the shaving aid composition to set abrasive conditions (e.g., a given surface composition and speed of an abrasive device such as, e.g., an abrasive wheel) and determining how much of the composition wears off in a given time period.

In some embodiments, wear resistance can be measured by maintaining a flow of water over a textured surface and between this textured surface and the shaving aid body. This process is described in U.S. Patent 7811553 at col. 12, lines 33 – 56. Another wear test utilizes cartridges of shaving aid composition molded to a holder and testing the cartridge using a wet wheel apparatus. This process is described in U.S. Patent 7811553 at col. 12, line 57 – col. 13, line 13.

VI. Razor Details

Razors Including a Molded Shaving Aid Composition

The molded shaving aid compositions are in certain embodiments incorporated into a razor, e.g., into a razor head. For example, the molded shaving aid composition can be attached to one or more holders, which are themselves configured to be attachable to a razor head. Referring to FIGS. 2A, 2B, and 3, a shaving razor 10 includes a disposable cartridge 12 and a handle 14. As shown in FIG. 3, cartridge 12 includes a connecting member 18, which removably connects cartridge 12 to a connecting portion 19 of handle 14, a blade unit 16, which is pivotally connected to connecting member 18, and a shaving aid holder 30 mounted on the blade unit 16. Referring to FIG. 2A, the blade unit 16 includes a plastic housing 20, a guard 22 at the front of housing 20, and blades 28 between guard 22 and the rear of housing 20.

The blade unit 16 can be similar to blade units described in U.S. Patent No. 5,661,907. The handle 14 can be similar to those described in U.S. Patent Nos. 5,855,071, 5,956,851 and/or 6,052,903. The connecting member 18 that is used to connect blade unit 16 to handle 14 can be similar to connecting members described in U.S. Patent Publ. Nos. 2006/0080837A, titled "Shaving Razors and Cartridges," filed on 10/20/2004, and 2006/0080838A, and/or U.S. Patent No. 8,033,023.

As will be discussed in further detail below, the holder 30 carries a pair of shaving aid portions 31A, 31B. The front shaving aid portion 31A contacts the skin in front of the blades, i.e., before shaving, and the rear shaving aid portion 31B contacts the skin behind the blades. One or both of the shaving aid portions are formed of the molded shaving aid composition described herein, while one of the shaving aid portions can optionally include a different or additional composition. For example the front shaving aid portion may include the molded shaving aid composition, while the rear portion may include skin soothing and conditioning ingredients such as emollients and moisturizers in place of or in addition to the shaving aid portion.

The shaving aid portions are mounted so that they will resiliently deflect upon contact with the skin, from a normal, undeflected position (FIG. 4E) to a flexed position (FIG. 4F). This deflection allows the razor to be easily used in hard to reach or confined areas, such as the armpit (axilla) or behind the knee. Deflection of the shaving aid portion also prevents premature wear of the shaving aid portion and discomfort to the user in cases where the user applies excessive pressure during shaving. Preferably, the angle of deflection (angle A, FIG. 4F) is at least about 10 degrees, e.g., from about 10 to 60 degrees, typically about 20 to 40 degrees. Angle A is

measured by drawing a line from a pivot point P located in the approximate center of the elastomeric hinge to the highest point on the shaving aid portion 31A when the shaving aid portion is in its undeflected position, and measuring the angle between this line when the shaving aid portion is in its undeflected position and the same line when the shaving aid portion is deflected to its design limit. The resilient mounting of the shaving aid portions will be discussed in further detail below. The heights H1 and H2 of the shaving aid portions in the undeflected position (FIG. 4E) will vary, but may be, for example, from about 1 to 4 mm, e.g., about 1.5 to 3.0 mm. H1 and H2 are generally within about 0 to 50% of each other. Generally, the heights of the two shaving aid portions will be proportional to the wear rates of the compositions used, so that the shaving aid portions will be exhausted at approximately the same time.

The holder 30 may be mounted so that it is removable from the cartridge body by the consumer (e.g., if the consumer wishes to add a shaving aid holder to a cartridge that does not include one), or, alternatively, may be permanently mounted on the cartridge body or integrally molded with the cartridge body. In the embodiment shown in FIGS. 2A-6D, the holder 30 clips onto the cartridge by engagement of clips 32 and 34 (FIG. 4B) with the back surface 37 of the housing 20 of the blade unit, as shown in FIG. 2B. The holder 30 may be engaged with the housing by sliding the housing under clips 34 and then deflecting clips 32 to snap them in place.

Structure of the Shaving Aid Holder

Referring to FIG. 4A, shaving aid holder 30 includes a frame member 36 that extends around the periphery of the cartridge body when the holder 30 is in place. Generally, frame member 36 is formed of a molded plastic. In some embodiments, the sides 38 of the frame member extend over side regions of the cartridge body, to securely hold the holder in place. Sides 38 should generally be sufficiently thin, adjacent the blade ends, so that shaving performance is not compromised. In some embodiments, a ramped area is provided between the very thin edges 40 adjacent the blade ends to an area outboard of the edges. For example, the sides 38 generally have a thickness of less than 0.15 mm at edges 40, and less than 0.4 mm at line L, about 0.5 mm inboard of edges 40. This ramped area 59 provides rails 61, between line L and the outer side edge 63 of the holder 30, that may enhance tracking of the razor during use.

Referring to FIGS. 4E, 5A-5D and 6A-6D, shaving aid portions 31A and 31B are carried on a pair of wings 42, 44. Wings 42, 44 may be formed of the same plastic as the frame, or may be formed of a different material. For example, the wings may be formed of the same material as the hinges 52, 54 (FIG. 5B, discussed below) that join the wings and frame. In this case, the wings and hinges may be overmolded onto the frame in a single molding step.

The wings include a plurality of apertures 46 (FIG. 5B) that allow the shaving aid to flow through the thickness of the wing and form a mechanical interlock (e.g., by flowing together to form a unitary mass) on the back side of the wing, securing the shaving aid to the wing.

Elastomeric bumpers 48, 50 are provided at the corners of the wings, underlying the shaving aid portions, so that as the shaving aid portions are exhausted the user's skin will contact elastomer rather than hard plastic. Generally, the elastomeric bumpers have a thickness T (FIG. 6C) of at least 1 mm, e.g., about 1.5 to 3 mm. In some embodiments, the elastomer is relatively soft for user comfort and so that the hinge will have a soft flex. For example, the elastomer may have a hardness of less than about 50 Shore A, e.g., less than about 40 Shore A. The elastomer may be, for example, a block copolymer such as those available under the tradename KRATON®. In some embodiments, the elastomer has sufficient chemical resistance so that it will not degrade during prolonged contact with the ingredients of the shaving aid composition.

Referring to FIG. 6D, even in their normal, undeflected position, the wings 42, 44 curve downward, well below the plane defined by the blade edges. This curvature allows the wings to carry a relatively large amount of soap, without the upper surface of the shaving aid portion extending too far above the plane of the blade edges or the lowest area of the shaving aid portion being too low to ever contact the skin during use. Generally, the lowest point on each of the wings 42, 44 is at least about 1 mm below the plane defined by the blade edges, e.g., about 2 to 6 mm below this plane. If desired, e.g., if the shaving aid is relatively wear resistant, the wings may extend relatively straight from the frame. In one embodiment, the shaving aid and shaving aid holder can be similar to that used on the Venus Breeze® line of 2-in-1 razor, and/or the Schick® Intuition® line of razors. In another embodiment, the shaving aid and shaving aid holder can be similar to those disclosed U.S. Patent Publ. Nos. 2006/225285A and 2006/080837A, and/or US Patent No. 7,811,553.

Resilient Mounting of Shaving Aid Portions

Wings 42, 44 are resiliently mounted on the frame member 36, to allow deflection of the shaving aid portions 31A, 31B during shaving, from the normal position shown in FIG. 4E to the deflected position shown in FIG. 4F. Flexible hinges 52, 54 (FIG. 5B) provide this resilient connection between the wings and the frame.

In some embodiments, hinges 52, 54 are formed of an elastomeric material, e.g., a block copolymer. Typically, the hinges are formed of the same elastomeric material as the elastomeric bumpers 48, 50 discussed above. The elastomeric material is generally selected to provide a soft flex, so that the wings deflect readily upon contact with the user's skin, while also providing a good spring return to the wings. For example, the elastomeric material may have a flexural

modulus of about 100 to 300 psi. The modulus that will provide the desired product characteristics will depend upon the thickness T and length L (FIG. 5D) of the hinges. The thickness and length of the two hinges can be the same or different, and these dimensions and the elastomeric material used can be selected to give the two wings desired flexural characteristics.

5 The thickness of the hinges may be, for example, from about 0.5 to 2.0 mm and the length may be from about 0.5 to 3.0 mm. In the embodiment shown in FIGS. 5A-5D, the hinges extend almost the full width of the holder 30. However, if desired, the hinges may be narrower or may consist of discontinuous hinge portions.

The elastomeric hinges may be overmolded onto the frame. To assist in this process, in the embodiment shown in FIGS. 5A-6D, the frame is connected to each of the wings by a pair of connecting members 56 that extend integrally from the frame to the wings (FIG. 6B). If desired, these connecting members may be cut after overmolding has been completed. Alternatively, the wings and frame may be separate components that are placed in an insert mold and overmolded with elastomer. Forming the hinges solely of elastomer (i.e., substantially free of rigid plastic) may result in a softer flexing hinge in some cases. The shaving aid portions can also be attached to the frame as described in U.S. Patent Publication No 2011/0247216A, titled "Shaving Cartridge Having Mostly Elastomeric Wings", filed on March 8, 2011.

Contouring of Shaving Aid Portions

Referring to FIG. 4E, the front shaving aid portion 31A includes a ramped leading surface 33 that is contoured to cause the shaving aid portion to deflect upon skin contact, so that the cartridge will not rock back when shaving aid portion 31A contacts the skin during shaving. As can be seen in FIGS. 4A and 4D, a leading edge 110 of the shaving aid portion 31A has a first thickness t1 adjacent the side surfaces of the holder 30, and tapers to a second, lesser thickness t2 adjacent a center region of the shaving aid portion. This shape allows the front shaving aid portion to have the ramped leading surface 33, while still providing as much shaving aid as possible adjacent the side surfaces. If desired, the entire leading edge could have the lesser thickness t2. The front face 35 of the shaving aid portion 31A includes smoothly curved, arcuate side areas 37A, 37B, to enhance the soap-deflecting contour of leading surface 33 and to avoid edges and corners that could be uncomfortable during shaving and facilitate shaving of tight areas such as the underarm and behind the knee. Similarly, the intersections 39 of leading surface 33 and front face 35 are smoothly radiused.

Both the front shaving aid portion 31A and the rear shaving aid portion 31B are contoured so that the upper surface of each shaving aid portion (surface 41 of shaving aid portion 31A and surface 43 of shaving aid portion 31B) lies relatively flat against the user's skin when

the wing 44 is deflected. This flat position, shown in FIG. 4F, allows as much shaving aid as possible to be in contact with the user's skin during shaving.

Ease of Shaving

Shaving aid portions 31A, 31B have a width W at their widest point (FIG. 4C) that is equal to or slightly less than the width of the frame 36 of the holder 30. Thus, the shaving aid portions do not extend beyond the side walls of the frame 36. As a result, the area around the side walls of the frame is unobstructed, allowing the shaver to determine, by sight and/or tactile sensation, what area has been shaved. If desired, the shaving aid portions may extend slightly beyond the side walls of the frame, e.g., by 2 mm or less on each side.

Shaving is also facilitated by rails 61 (FIGS. 4A, 5C), discussed above, which can engage the user's skin during shaving, potentially enhancing tracking of the cartridge.

While the embodiments described above have a pair of shaving aid portions, the razors can in the alternative have a single shaving aid portion, which can be located in front of the blades, behind the blades, or can extend completely around the blades.

In one embodiment, the device comprises two shaving aid portions, one positioned forward of said one or more shaving blades and one positioned aft of said one or more shaving blades, wherein at least one of said shaving aid portions comprises said thermally resilient sensate. In one embodiment, said shaving aid portions positioned aft of said one or more shaving blades comprises said thermally resilient sensate. In one embodiment, said shaving aid portions positioned forward of said one or more shaving blades comprises said thermally resilient sensate. In another embodiment, both shaving aids comprise a thermally resilient sensate, they can be the same in each shaving aid or different. Without intending to be bound by theory, it can be particularly useful to include the thermally resilient sensate in the shaving aid aft of the blades so the cooling sensation is left on the skin after the blade stroke.

It should be understood that every maximum numerical limitation given throughout this specification includes every lower numerical limitation, as if such lower numerical limitations were expressly written herein. Every minimum numerical limitation given throughout this specification includes every higher numerical limitation, as if such higher numerical limitations were expressly written herein. Every numerical range given throughout this specification includes every narrower numerical range that falls within such broader numerical range, as if such narrower numerical ranges were all expressly written herein.

All parts, ratios, and percentages herein, in the Specification, Examples, and Claims, are by weight and all numerical limits are used with the normal degree of accuracy afforded by the art, unless otherwise specified.

The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean
5 "about 40 mm". All measurements are performed at 25 °C, unless otherwise specified.

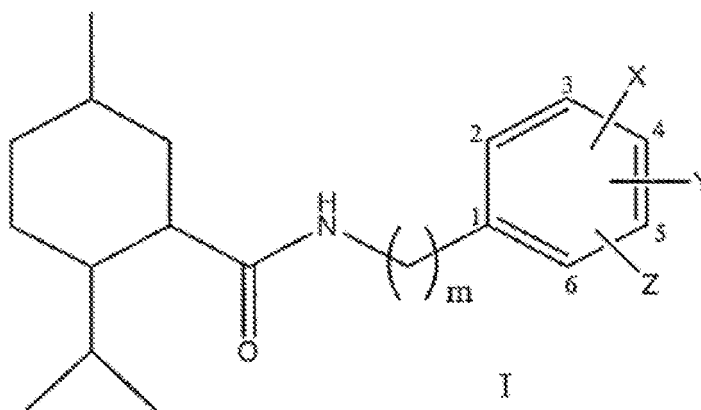
All documents cited in the DETAILED DESCRIPTION OF THE INVENTION are, in the relevant part, incorporated herein by reference; the citation of any document is not to be construed as an admission that it is prior art with respect to the present invention. To the extent that any meaning or definition of a term or in this written document conflicts with any meaning
10 or definition in a document incorporated by reference, the meaning or definition assigned to the term in this written document shall govern. Except as otherwise noted, the articles "a," "an," and "the" mean "one or more."

While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and
15 modifications can be made without departing from the spirit and scope of the invention. It is therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

CLAIMS

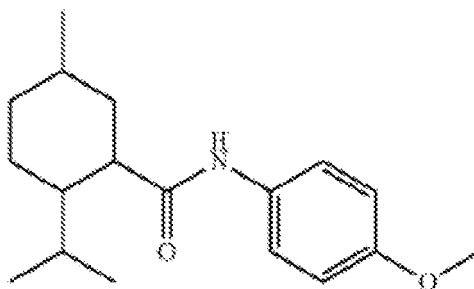
What is claimed is:

1. A shaving cartridge comprising:
 - a housing having a front edge and a rear edge;
 - one or more shaving blades between the front edge and the rear edge;
 - a shaving aid holder; and
 - at least one shaving aid portion mounted on the shaving aid holder, the shaving aid portion comprising from 0.1% to 10 wt % polyoxyethylene, from 0.001% to 25%, by weight of the shaving aid portion of a thermally resilient sensate, and a soap base.
2. The shaving cartridge of claim 1, wherein said thermally resilient sensate comprises at least one of:
 - a. a N-substituted menthanecarboxamide having the formula:

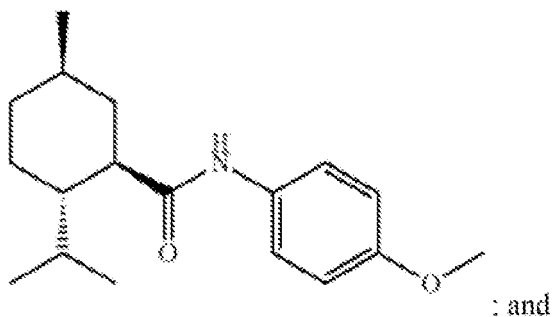


in which m is 0 or 1, Y and Z are selected independently from the group consisting of H, OH, C1-C4 straight or branched alkyl, or, a C1-C4 straight or branched alkoxy, X is $(CH_2)_n-R$, where n is 0 or 1 and R is a group with non-bonding electrons, subject to the provisos that: (a) when Y and Z are H, X is not F, OH, MeO or NO_2 in the 4-position and is not OH in the 2 or 6-position, and (b) when Y or Z is H then X , Y and Z are such that (i) the groups in the 3- and 4-positions are not both OMe, (ii) the groups in the 4- and 5-positions are not both OMe, (iii) the groups in 3- and 5- positions are not OMe if the group in the 4-position is OH, and (iv) the groups in the 3- and 5-positions are not OH if the group in the 4- position is methyl;

- b. a menthane carboxylic acid-N-(4-methoxyphenyl)-amide of formula:

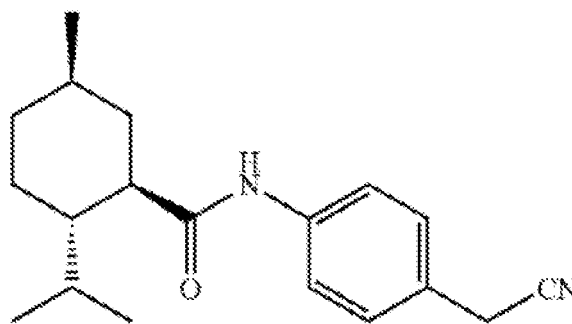


- c. a menthane carboxylic acid-N-(4-methoxyphenyl)-amide of formula:



- d. a mixture thereof.

3. The shaving cartridge of any preceding claim, wherein said thermally resilient sensate comprises N-substituted menthanecarboxamide, and wherein X is in the 4-position, preferably wherein X is in the 4-position and Y and Z are H, OH, Me or OMe.
4. The shaving cartridge of any preceding claim, wherein said thermally resilient sensate comprises N-substituted menthanecarboxamide, and wherein the group with non-bonding electrons is selected from halogens, OH, OMe, NO₂, CN, Ac, SO₂NH₂, CHO, CO₂H and Ci-C₄ alkyl carboxylates.
5. The shaving cartridge of any preceding claim, wherein said thermally resilient sensate comprises N-[4-(cyanomethyl)phenyl]-(1R,2S,5R)-2-isopropyl-5-methylcyclohexanecarboxamide of formula:



6. The shaving cartridge of any preceding claim, further comprising an additional cooling agent selected from the group consisting of: L-menthol; p-menthane-3,8-diol; Isopulegol; Methoxypropane-1,2,-diol; Curcumin; Menthyl Lactate (such as Frescolat ML by Symrise); Gingerol; Icilin; Tea Tree Oil; Methyl Salicylate; Camphor; Peppermint Oil; N-Ethyl-p-menthane-3-carboxamide; Ethyl 3-(p-menthane-3-carboxamido)acetate; 2-Isopropyl-N,2,3-trimethylbutyramide; Menthone glycerol ketal, Menthone Glycerine Acetal; Coolact 10; and mixtures thereof, preferably wherein said optional cooling agent is a mixture of menthol and menthyl lactate, more preferably wherein the mixture of menthol and menthyl lactate is in a ratio of from 1:4 to 4:1 by weight.
7. The shaving cartridge of any preceding claim, further comprising a pyrrithione source at a level of from 0.01% to 5%, by weight of the soap base.
8. The shaving cartridge of any preceding claim, wherein the pyrrithione source is selected from a group consisting of zinc pyrrithione, sodium pyrrithione, pyrrithione acid, dipyrrithione, chitonsan pyrrithione, magnesium disulfide pyrrithione, and combinations thereof.
9. The shaving cartridge of any preceding claim, wherein said soap base further comprises an additional antibacterial agent selected from the group consisting of triclocarban; triclosan; a halogenated diphenylether; hexachlorophene; 3,4,5-tribromosalicylanilide; salts of 2-pyridinethiol-1-oxide; and mixtures thereof.
10. The shaving cartridge of any preceding claim, wherein said soap base further comprises from 0.3% to 20% by weight of the soap base of a pH adjusting agent selected from a group consisting of ammonia solution, triethanolamine, diethanolamine, monoethanolamine, potassium

hydroxide, sodium hydroxide, soluble carbonate salts, and combinations thereof, wherein said soap attains a pH of greater than or equal to 10.7.

11. The shaving cartridge of claim 10 or any claim dependent therefrom, wherein said soluble carbonate salt is selected from a group consisting of sodium carbonate, potassium carbonate, ammonium carbonate, aluminum carbonate, magnesium carbonate, sodium bicarbonate, potassium bicarbonate, and combinations thereof.

12. The shaving cartridge of any preceding claim, wherein the polyoxyethylene has a molecular weight of from 100,000 to 5,000,000 and a silicone cross-polymer.

13. The shaving cartridge of any preceding claim, further comprising a silicone polymer selected from the group consisting of dimethicone PEG-7 panthenyl phosphate, dimethicone PEG-7 phosphate, dimethicone PEG-7 undecylenate, dimethicone/methicone copolymer, perfluorononyl dimethicone methicone copolymer, dimethicone/vinyl dimethicone crosspolymer in dimethicone, vinyl dimethicone/lauryl dimethicone crosspolymer in mineral oil, vinyl dimethicone/lauryl dimethicone crosspolymer in squalane, vinyl dimethicone/methicone silsesquioxane crosspolymer, squalene and lauryl dimethicone/polyglycerin-3 crosspolymer, triethylhexanoin and lauryl dimethicone/polyglycerin-3 crosspolymer, and dimethicone/polyglycerin-3 crosspolymer and dimethicone, PEG/PPG-20/6 dimethicone, behenoxydimethicone, C24-28 alkyl methicone, dimethicone/vinyl dimethicone crosspolymer, and C12-C14 Pareth-12.

14. The shaving cartridge of any preceding claim, wherein the shaving aid portion further comprises a polyethylene, polybutene, and mineral oil composition.

15. The shaving cartridge of any preceding claim, comprising two shaving aid portions, one positioned forward of said one or more shaving blades and one position aft of said one or more shaving blades, wherein at least one of said shaving aid portions comprises said thermally resilient sensate.