The object of the invention is to provide improved astringent compositions for application to the human skin, more especially to inhibit or control perspiration. Such compositions may be termed deodorants.

Unlike ordinary perspiration deodorizing or inhibiting preparations, which are thin liquids, and usually aqueous solutions, the compositions of this invention are semi-solid and strongly alkaline. Consequently they do not spill like true liquids, they are convenient to use, and dry quickly. The compositions contain much alcohol, small amounts of wax and soap, and a requisite amount of an astringent salt.

I have discovered that excellent products of this kind can be obtained if certain soaps, namely those of aluminum or zinc, are incorporated in the compositions, and that though these soaps are substantially insoluble in water and only slightly soluble in hot alcoholic media, they may be dissolved in a hot alcoholic menstruum if either aluminum chloride or zinc chloride is present. Each of these salts is an effective anti-perspiration astringent.

From the fact that hot solutions of the alcohol, the astringent salt and the aluminum or zinc soap, without the wax, remain liquid after cooling, it is evident that these soaps are not, in themselves, solidifying agents. With the wax, however, homogeneous masses of any desired consistency ranging from creamy to firm and virtually solid are obtained. It may be that the soaps in question serve in some way as auxiliary solidifying agents, but their primary and important function is to keep the wax, in the presence of the astringent salt, from crystallizing or separating in such manner as to produce undesirable graininess or roughness in the texture of the composition which is to be applied to the human body. The mechanism of their action may be that of emulsifiers or protective colloids. In any event, the compositions containing them are agreeable to use, and because the application is smooth and even, perspiration is more effectively controlled and there is little or no disagreeable after-feeling on the skin.

The difference between preparations containing aluminum or zinc soaps as "modifiers", and those containing only a wax, an astringent salt and an alcoholic medium can be demonstrated by a microscopic examination.

Under a magnification of about 100 diameters, compositions of the type disclosed in this invention are found to be substantially free of aggregates of wax. On the other hand if the metallic soap is omitted, a similar inspection reveals the presence of a large number of wax particles of varying sizes, and in some instances, having angular shapes.

Especially desirable compositions are had when the soap is of the same metallic radical as that contained in the astringent salt. Usable products may be made, however, with a salt of one of the metallic radicals and a soap of the other radical. Soaps such as stearates, palmitates, and oleates, and mixtures thereof, may be used. A variety of waxes or waxy substances may be employed, such as candelilla wax, carnauba wax, spermaceti and beeswax, either singly or in admixture with each other.

The term "alcohol" or "alcoholic" as used here-in refers only to ethyl alcohol and propyl alcohol (normal or isopropyl) or mixtures of these. Where ethyl alcohol is given as a constituent it will be understood that it may be either the pure alcohol or alcohol denatured according to a formula approved for topical use.

The following examples illustrate the invention:

**Example 1**

12 gms. of candelilla wax and 18 gms. of aluminum stearate are covered with a mixture of 108 cc. of absolute ethyl alcohol denatured according to some U.S. Government formula approved for topical use, and 116 cc. of 91% (volume) isopropyl alcohol. 12.36 gms. of anhydrous aluminum chloride are now added gradually. After all the astringent salt has been added the mixture is boiled under reflux, which prevents loss, until solution is effected. 0.7 cc. of perfume base is then added, and the mixture is poured into containers to cool. The resulting product is of smooth, firm, strong consistency, having a flow point of about 131°–133° F., and resistant to shock. Notwithstanding the mechanical rigidity of the system, portions of the composition can easily be removed from the container by means of the fingers or otherwise for application to the skin. At body temperature and under moderately brisk rubbing the portions so removed liquefy readily, good penetration is obtained, and the application dries rapidly because of the evaporation of the alcohol. In the use of such a composition there need be no waste since the nature of the material is such that the right amount may be taken from the container, applied directly and solely to the skin area to be treated and then rubbed in. Not only is the drying period very short, but there is little or no need to rinse the treated area of the skin with water.
preparation does not harden and irritate the skin, so severely as do water solutions of astringent deodorants, nor does it attack the clothing so readily.

If in the foregoing example carnauba wax is used in like amount in place of candelilla, a comparable substance is produced, though it may be noted that while the flow point of the composition with carnauba wax (about 170° F.) is materially higher than that of candelilla wax, astringent salt, composition has less resistance to shock.

For firm, substantially solid products, capable of withstanding the shocks of shipment and the temperatures of hot climates, the water content of the compositions should be limited within about 10% of the total weight and preferably within about 6%. Too much water weakens the structure and lowers the flow point, so that the structure lacks solidity. On the other hand, for soft creams or for forms sufficiently flowable to be dispensed from collapsible tubes, more water is permissible.

Substantially or entirely anhydrous compositions are made with anhydrous alcohol and the astringent salt in anhydrous form. Some water in the composition lessens darkening of the composition due to heating of the wax and the action of aluminum chloride on wax.

The astringent salt may be used in either the anhydrous or the hydrated form. In the following example hydrated aluminum chloride is employed.

**Example 2**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum chloride (AlCl₃·6H₂O)</td>
<td>22.5 gms.</td>
</tr>
<tr>
<td>Candelilla wax</td>
<td>12.0 gms.</td>
</tr>
<tr>
<td>Aluminum stearate (100%) ethyl alcohol</td>
<td>16.0 gms.</td>
</tr>
<tr>
<td>Absolute (98%) isopropyl alcohol</td>
<td>108.0 cc.</td>
</tr>
<tr>
<td>Of perfume base</td>
<td>0.7 cc.</td>
</tr>
</tbody>
</table>

These constituents may be all added at once, and are boiled under a reflux until solution is effected, after which the fluid mixture is put in containers and allowed to cool and set.

While mixtures of ethyl and propyl alcohols seem to be preferable in some of the compositions, satisfactory results are obtained when all of the alcohol is ethyl alcohol or when all of it is propyl alcohol. The quantities of the ingredients, soap (of aluminum or zinc), wax and astringent salt, always in minor proportions, may be varied.

More or less astringent salt is introduced into the composition to give either a stronger or less pronounced perspiration-inhibiting effect. The salt may be added up to, or even somewhat beyond, the limit of solubility in the menstruum.

In place of the aluminum stearate of these examples, a like amount of zinc stearate may be substituted. It appears, however, that products of more stable and permanent composition result if the insoluble soap and the soluble salt have the same metallic radical. Sufficient aluminum or zinc soap is added to inhibit to a substantial degree granulation of the wax.

**Example 3**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carnauba wax</td>
<td>12 gms.</td>
</tr>
<tr>
<td>Zinc stearate</td>
<td>16 gms.</td>
</tr>
<tr>
<td>Absolute (100%) ethyl alcohol</td>
<td>108 cc.</td>
</tr>
<tr>
<td>Absolute (99%) isoamyl alcohol</td>
<td>98 cc.</td>
</tr>
<tr>
<td>Of perfume base</td>
<td>22.5 gms.</td>
</tr>
</tbody>
</table>

The liquid mixture is poured into containers. When the product sets, it is of firm, strong consistency, adapted for application to the skin in the manner that has been described. If in a composition of the kind to which this invention relates, aluminum stearate is used as the soap with zinc chloride as the astringent salt, only a relatively small amount of the soap goes into solution, but smooth and fairly firm creams may be obtained.

The compositions may include various compatible additions. As a pigmenting agent titanium oxide has proved to be advantageous not only to cause the product to be lighter in color but also because it improves the texture and the physical effect of these compositions. When one of the compositions containing titanium oxide is applied, the skin and its hairs are left in much the same condition as if the surface had been dusted afterward with talc. Titanium oxide at about 2% of the total weight makes very white an aluminum chloride composition of the kind to which this invention relates.

I claim:

1. A composition for topical use, containing an astringent salt selected from the group consisting of aluminum chloride and zinc chloride, a soap of one of these metals, wax, and a predominant amount of alcohol.

2. A composition for topical use, containing an astringent salt selected from the group consisting of aluminum chloride and zinc chloride, a soap of the same metallic radical as that contained in the salt, wax, and a predominant amount of alcohol.

3. A composition for topical use, containing aluminum chloride, aluminum soap, wax, and a predominant amount of alcohol.

4. A composition for topical use, containing zinc chloride, zinc soap, wax, and a predominant amount of alcohol.

5. A composition for topical use, containing an astringent salt selected from the group consisting of aluminum chloride and zinc chloride, carnauba wax, soap of one of the aforementioned metals, and a predominant amount of alcohol.

6. A composition for topical use, containing an astringent salt selected from the group consisting of aluminum chloride and zinc chloride, carnauba wax, soap of one of the aforementioned metals, and a predominant amount of alcohol.

7. A composition for topical use, containing aluminum chloride, candelilla wax, soap of the group of metals consisting of aluminum and zinc, and a predominant amount of alcohol.

8. A composition for topical use, containing aluminum chloride, carnauba wax, aluminum soap, and a predominant amount of alcohol.

9. A solid or semi-solid composition for topical use, containing aluminum chloride, carnauba wax, a soap of the group of metals consisting of aluminum and zinc, and a predominant amount of alcohol.

10. A solid or semi-solid composition for topical use, containing aluminum chloride, aluminum stearate, candelilla wax, and a predominant amount of alcohol.

11. A solid or semi-solid composition for topical use, containing zinc chloride, zinc stearate, candelilla wax, and a predominant amount of alcohol.

12. A solid or semi-solid composition for topical use, containing zinc chloride, zinc stearate, candelilla wax, and a predominant amount of alcohol.

13. A solid or semi-solid composition for topical use, containing zinc chloride, wax, sufficient zinc stearate to inhibit granulation of the wax, and a predominant amount of alcohol.

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