SANITARY NAPKIN HAVING
HOMOGENEOUSLY DISTRIBUTED
MICROCAPSULES FILLED WITH
DELAY RELEASABLE BACTERICIDAL
AND FUNGICIDAL DEODORANT

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Filed: Feb. 4, 1970
Appl. No.: 8,721

Foreign Application Priority Data
Feb. 4, 1969 Luxembourg..................57,907

U.S. Cl. ..................424/28, 128/285, 128/270,
128/290, 128/284, 252/305, 252/316,
252/522, 424/47, 424/65, 424/68, 424/69

Int. Cl. ..........................A61k 7/00

Field of Search..................424/14, 16, 28, 65–69,
424/47, 252/316, 15/104.93, 401/132;
128/270, 284, 285

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Primary Examiner—Shep K. Rose

ABSTRACT
A sanitary napkin made of cellulose batting or layers
of paper or cotton absorbent fabric and a multiplicity of
individual microcapsules enveloping a deodorant
agent. The microcapsules are homogeneously
distributed in the cellulose batting or in alternating
layers on the fabric to effect a delayed release of the
deodorant therefrom, the walls of said microcapsules
being permeable or soluble on contact with the fluid
associated with menstrual discharge.

4 Claims, No Drawings
SANITARY NAPKIN HAVING HOMOGENEOUSLY DISTRIBUTED MICROCAPSULES FILLED WITH DELAY RELEASABLE BACTERICIDAL AND FUNGICIDAL DEODORANT

The present invention relates to a treating cosmetic composition, preferably a deodorant composition, in which the deodorant effect is delayed with reference to the moment of application of the composition, the effect appearing only after perspiration.

Deodorant compositions used for the care of the body, whose deodorant effect is immediate after application are already known, but it is obvious that such compositions cannot give entire satisfaction. In the case in which the composition is used preventively, the deodorant effect is exerted as soon as it is applied with gradually diminishing effectiveness. Moreover, and on the other hand, application of such a composition at the desired moment also presents obvious difficulties. It must be added that there is the necessity of using the active product in excess at the time of application of the composition, or else there must be numerous applications with all the bother that this entails.

The present invention is intended to obviate the above mentioned difficulties, and especially to avoid occurrence of the deodorant effect from the moment of application of the deodorant cosmetic composition.

The present invention thus relates to a new deodorant composition containing the active elements of an ordinary deodorant composition, the said elements only acting at the time of perspiration or after a certain lapse of time after sufficient perspiration.

The present invention also relates to the process of deferred release effected in situ after perspiration, at the location of application of the cosmetic composition.

The present invention also relates to the process of preparation of the above mentioned cosmetic deodorant compositions.

According to the invention, it has been discovered that deferred activity of the present cosmetic composition as well as an improvement on its effectiveness can be attained if the active deodorant component is physically separated from the vehicle constituted by the rest of the cosmetic composition, until the occurrence of perspiration. This is accomplished by the known technique of microencapsulation wherein the active component, divided into small particles, is surrounded by a suitable envelope.

The process for preparing the microcapsules which are separately obtained does not constitute part of the invention.

According to the present invention, the “support” phase of the deodorant composition is constituted by the usual vehicle of these compositions, the said “support” phase being cellulose abbernt or any absorbent fabric on which the “treating” phase is deposited. The “treating” phase which is constituted by microencapsulated compounds or agents contained in the above mentioned vehicle causes the perspiration odors or other odors to disappear at the end of a certain period after occurrence of the said odors.

It has been discovered surprisingly that the setting off of the deodorant activity can be ensured in that a deodorant product is used which is contained in microcapsules C whose envelopes E are soluble in water or permeable to water deriving from sweat, or soluble in mixtures of water and other solvents, or destroyed by microorganisms that develop after perspiration. Destruction of envelopes occurs moreover in proportion to the degree of sweating.

The use of the solubility or permeability of envelopes E in water as well as the destruction of these envelopes by microorganisms involves simple forms and preferably use of the mechanism of release of the present invention.

A modification of the release process consists in attaining or accelerating the destruction of envelope E by a mixture of water and another suitable agent. In this case, capsules C contain in addition to the deodorant composition, e.g., a lower alcohol such as ethanol or a polysaccharide, envelope E being sufficiently permeable to the water of perspiration. When there is used as compound constituting membrane E a copolymer of styrene and completely hydrolyzed maleic acid, for example, the water of perspiration penetrates through envelope E of the capsule in which it constitutes a mixture, e.g., water-ethanol which for a content of about 50:50 readily dissolves the said envelope E. As a result, after a certain interval and depending upon the abundance of perspiration, a larger or smaller number of capsules release the deodorant product, in a way that is accelerated by the fact that more and more rapidly the optimal proportions for the solvent mixture are reached.

Envelope E of microcapsules C which contain the deodorant compositions are constituted by multifarious compounds, on condition that they be sufficiently dissolved or permeable in contact with the perspiration water, taking into account the pH thereof, or on condition that they be destroyed by microorganisms also developing in the course of perspiration.

The compounds forming envelopes E are selected especially from the following: gelatin, ethyl cellulose, cellulose acetophthalates, treated or untreated polyvinyl alcohols.

In general microcapsules are used whose sizes range from 30 to 500 microns, preferably from 100 to 250 microns, and the weight of envelopes E with reference to the total weight of capsules C ranges from 1 to 10 percent, preferably 3 to 6 percent by weight.

In accordance with the present invention, a powder, a stick or a lotion can be used as vehicle for capsules C, the lotion advantageously being used as an aerosol.

Capsules C contain for example deodorant agents such as compositions known as “G4” i.e., 2,2’-dihydroxy-5,5’-dichloro-diphenyl methane “G11”, i.e., 2,2’-methylenebis (3,4,6-trichlorophenol), quaternary ammonium compositions, alums, anilide derivatives such as salicylanilides and chlorophenyl hexanes, or ordinary deodorant cosmetic compositions.

It is possible also to use in addition to these compositions or compounds, or in their stead, microorganisms capable of destroying the microorganisms which occur in perspiration and which to a great extent are responsible for the odors that are to be suppressed.

Of course, the proportions of the release agents mentioned above are calculated with respect to the nature and thickness of envelope E so that release of the deodorant products occurs according to the intensity of the sweating, and destruction of envelopes E is effected necessarily after a sufficient interval. For this purpose
microcapsules C are used in an appropriate range insofar as size and envelope thickness are concerned.

In any case, when the above deodorant compositions are prepared, particular care is taken to adjust the density of the vehicle of the cosmetic composition to the density of microcapsules C or to use or prepare microcapsules C with a density sufficiently close to that of the above mentioned vehicle in which the said capsules are introduced. This result is attained by modification of the density of the vehicle, preferably, but it is also to proceed in the opposite way.

In the first case the density of the mixture can be adjusted to that of the microcapsules by addition of an excess of one of the ingredients or by introduction of a suitable inert substance (inert with reference to the other components).

Also, capsules C are introduced either directly at any moment of the preparation, or in pre-mixtures obtained from components of the vehicle of the cosmetic composition. It is likewise very useful to add a moistener to the capsules before introducing them into the deodorant composition or into a pre-mixture. In general, the deodorant compound of the invention is presented as a powder, a stick, a lotion or a sanitary napkin.

In the case of a powder, the cosmetic composition has in addition to capsules C, ingredients in the form of solid particles such as talcum powder and similar powders. In case it is in the form of a stick, it is necessary to take particular care that the microcapsules C not be destroyed by mechanical pressure during manufacture and for this purpose pre-mixtures are advantageously used, the envelopes being thicker and capsules C being smaller.

When the deodorant compositions are in aerosol form, envelope E of the microcapsules is a compound that is sufficiently elastic so that the capsules C are not destroyed in spraying by rapid increase in volume due to sudden decompression.

The present invention relates especially to deodorant cosmetic compositions, but it is obvious that it also applies very generally to all compositions for treatment that are used for body care in which perspiration plays a significant role either directly or indirectly.

According to a modification, a mixture containing, in addition to treating products and/or deodorants used in an anhydrous medium, acid anhydrides such as phosphoric anhydride or lactic anhydride which then yield the corresponding acids.

According to another embodiment, it is possible to utilize microcapsules C whose envelope E is coated on the outside at least by a thin envelope here designated E', said thin envelope being inert with reference to the vehicle of the cosmetic composition and having a degree of elasticity which is greater than that of envelopes E, the said envelopes being water-permeable and subject to destruction by an acid or by a water-ethanol mixture.

The use of envelopes E' allows use of envelopes E which have the above mentioned properties but for which it is not necessary that the compounds comprising them be inert to the vehicle of the cosmetic composition. The association of envelopes E and E' allows therefore the attaining more readily of microcapsules of the invention especially in the case in which the cosmetic composition is stored as aerosol since the microcapsules must not be destroyed at the moment of projection. The envelopes E' may be prepared with the polymers and colloids already mentioned.

The following non-limiting examples in which parts and percentages refer to weight are given for purposes of illustration and to facilitate a fuller understanding of the subject of the present invention:

EXAMPLE 1

Deodorant powder.

A vehicle (perfumed powder) is prepared with the following mixture:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talc</td>
<td>98</td>
</tr>
<tr>
<td>Perfume</td>
<td>2</td>
</tr>
<tr>
<td>There is also prepared, by grinding, a mixture of:</td>
<td></td>
</tr>
<tr>
<td>Basic aluminum hydrochlorate</td>
<td>98</td>
</tr>
<tr>
<td>Hexachlorophene</td>
<td>2</td>
</tr>
</tbody>
</table>

The latter powder is microencapsulated using cellulose acetophthalate, the average size of the capsule being about 100 to 250 microns.

There are then mixed: 72 parts by weight perfumed talc with 28 parts by weight microcapsules.

A delayed-action deodorant powder is thus obtained.

This powder clings to the skin at the selected places and at the moment of its formation, sweat dissolves the envelope of the microcapsules, releasing the active products and thus suppressing any unpleasant odor.

EXAMPLE 2

Deodorant lotion used with a hand sprayer.

A perfumed alcohol solution is prepared using:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfume</td>
<td>2</td>
</tr>
</tbody>
</table>

There is also prepared a powder mixture containing:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected quaternary ammonium</td>
<td>1.5</td>
</tr>
<tr>
<td>Basic aluminum hydrochlorate</td>
<td>98.5</td>
</tr>
</tbody>
</table>

which is microencapsulated in polyvinyl alcohol, the size of the microcapsules being from 30 to 50 microns.

To obtain the deodorant lotion, there is then prepared the following mixture:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perfumed alcohol;</td>
<td>60 parts by weight</td>
</tr>
<tr>
<td>Microcapsules:</td>
<td>40 parts by weight</td>
</tr>
</tbody>
</table>

This lotion is used with a sprayer which must be agitated just before use. The microcapsules are deposited on the skin at the selected places, and the perspiration dissolves their jacket when it forms, releasing the active products and thus suppressing any troublesome odor.

EXAMPLE 3

Aerosol deodorant lotion

Hexachlorophene is microencapsulated, using polyvinyl acetate or ethyl cellulose, the size of the microcapsules being 30 microns on the average.

A perfumed alcohol is thus prepared with:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>96° alcohol</td>
<td>98</td>
</tr>
<tr>
<td>Perfume</td>
<td>2</td>
</tr>
</tbody>
</table>

To this perfumed alcohol, there is added 0.5 percent by weight microcapsules. There is thus obtained an alcohol lotion with delayed deodorant effect, stored in an aerosol can containing, for example,
alcohol juice (sic) containing
the microcapsules Freon 12 dichlorodifluoromethane

As in the case of Example 2, it is necessary to agitate the aerosol can just before use.

EXAMPLE 4
Dry aerosol deodorant lotion

A solution is prepared containing:
- isopropyl myristate 60
- butyl stearate 5
- acetone 30
- perfume 5

As in Example 3, hexachlorophene is microencapsulated in microcapsules having the same dimensions.

To prepare a deodorant solution there is added 5 percent by weight microcapsules to the original mixture, and this is stored as aerosol as in Example 3, the can to be agitated just before use.

The anhydrous deodorant composition is deposited on the skin at the selected places: the microcapsule envelopes dissolve with appearance of sweat, thus effecting the desired deodorizing action.

EXAMPLE 5
Stick deodorant

A perfumed vehicle is prepared containing:
- sodium stearate 10
- glycerol 10
- propylene glycol 15
- colorant in 1% solution 0.15
- 96% alcohol to make up 100
- perfume sufficient

The whole is melted in a water bath at a temperature close to 50°C and allowed to cool: the mixture becomes pasty.

There is incorporated in it 0.5 percent hexachlorophene microencapsulated in an acetylphthalate cellulose polymer, the size of the microcapsules being of the order of 30 to 50 microns.

By suitable agitation the microcapsules are uniformly distributed in the pasty mass which is extruded, cooled and cut into sticks which are then packaged.

The delayed deodorant action is obtained in the same conditions as in the preceding examples.

EXAMPLE 6
Deodorant sanitary napkin

The following solution is microencapsulated:
- isopropyl myristate
- 2-ethyl 2-decanol
- Cetavlon (cetyl trimethyl ammonium bromide)
- salicylanilide
- hexachlorophene

Microencapsulation is effected with polyvinyl acetate, the size of the microcapsules being on an average 30 to 50 microns.

The microcapsules are homogeneously distributed in the body of a napkin made of cellulose batting or else they are distributed in alternating layers on a fabric of paper or cotton.

Destruction of the microcapsules and their bactericidal and fungicidal action is effected at the proper time.

Having described the invention what is claimed as new is:

1. A sanitary napkin consisting essentially of a body of an absorbent material of cellulose batting or layered paper or cotton fabric and a multiplicity of individual microcapsules enveloping effective amounts of a bactericidal and fungicidal deodorant agent, said microcapsules being homogeneously distributed in said cellulose batting or in alternating layers on said paper or cotton fabric, the size of each of said microcapsules ranging from 30–500 microns, the walls of said microcapsules being permeable or soluble on contact with the fluid associated with menstrual discharge whereby the release of said deodorant agent from said microcapsules in said sanitary napkin is delayed until contact with sufficient amounts of said fluid to permeate or solubilize the walls of said homogeneously distributed microcapsules, said walls of said microcapsules being made from a material selected from the group consisting of gelatin, ethyl cellulose, cellulose acetophthalate, polyvinyl alcohol and polyvinyl acetate and the density of said microcapsules being essentially equal to the density of said body of absorbent material.

2. The sanitary napkin of claim 1, wherein the walls of the microcapsules are made of polyvinyl acetate.

3. The sanitary napkin of claim 1, wherein the deodorant agent includes salicylanilide.

4. The sanitary napkin of claim 1, wherein the microcapsules have a size ranging from 30–50 microns.