

1

3,343,540

SWAB-TYPE APPLICATOR WITH IMPREGNATED MEDICAMENT

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 9 Claims. (Cl. 128—269)

This invention relates to an applicator and particularly, to an applicator for the disposition of a topical agent on a body surface. In an optimum embodiment, the invention relates to a medicative applicator.

The use of applicators for surface application of medicaments is common. In one form, such applicators may comprise an absorbent wad, such as a cotton wad, affixed to the end of a thin stem, such as a wooden stem, plastic stem or paperboard stem. In the use of such applicators, it is necessary to dip the absorbent wad into a bottle containing a medicative ingredient or to obtain the medicament from another external supply before it can be applied to the desired area.

In another form of applicator, a larger absorbent wad, such as cotton pad or gauze pad, may be used without a supporting stem. Such applicators are held directly in the hand during use in topical application.

The necessity of keeping bottles and tubes containing medicaments on hand has many disadvantages, the primary one being that of storage difficulties. In small dispensaries, first aid stations and first aid kits in particular, the lack of storage facilities is an acute problem. In hospitals where storage facilities are adequate the necessity of opening bottles and tubes and applying the medicament to the applicator wad is troublesome and may result in spillage and a generally inefficient operation.

Many sanitary problems are incurred in the use of medicament bottles and tubes which have been exposed to opening thereof. As an example, the ointment within a tube can be easily contaminated if the member which received the preceding eliminated ointment contained surface germs.

In the present invention the foregoing difficulties are obviated in that there is provided a disposable medicative applicator including a wad of absorbent material which is impregnated with a medicinal ingredient carried by a water dispersible low melting point resinous material in dry form. In a preferred embodiment the applicator comprises a wad affixed to at least one end of a stem.

In accordance with the invention, the medicative applicator is made by initially forming a uniform liquid mixture containing the medicinal ingredient, or medicament, and a melt of its resin carrier, impregnating the absorbent wad with said liquid mixture and thereafter cooling and solidifying said mixture impregnated on said wad. The medicant is dispersed in the melted resin, either as a true solution therein, or as a colloidal solution, or as a suspension, depending on the nature and concentration of the medicament and the nature of the resin. Usually the liquid mixture is prepared by adding the desired amount of medicament, with stirring, to a batch of melted resin.

The absorbent wad, which is preferably composed of cotton, is dipped into the liquid mixture to thereby impregnate the wad, and is then removed from the mixture bath and allowed to solidify by cooling.

The water dispersible resinous material is preferably a water soluble material capable of forming a true solution in water, but materials capable of forming stable emulsions, particularly in the presence of a surfactant, may also be used.

The resulting applicator with its resin coated wad can be labeled with the name of the medicinal ingredient

2

stamped or indicated by other means on the applicator stem. Of course, the applicators could be placed in boxes which are so labeled. When it is necessary to apply the particular medication, the wad is dipped into a water supply so that the resin is caused to soften and partially dissolve, and the wad is then applied to the zone requiring medication.

This invention is not restricted to the use of any particular water dispersible low melting point resinous material, nor does it relate to medicaments per se.

Of course it is necessary to use a water soluble, low melting point resin which is non-toxic and a non-irritant. A suitable resin is polyethylene glycol. Polyethylene glycol is sold commercially as Carbowax (a trademark of Carbide and Carbon Chemicals Company). The polyethylene glycols are available in the variety of grades, are waxy in appearance and texture and have a relatively low melting point. Polyethylene glycol 400 melts at about 25° C. while polyethylene glycol 4000 has a melting point of approximately 55° C. Polyethylene glycol 400, which is considerably softer than polyethylene glycol 4000, improves the smoothness and uniformity of the resulting coating, when it is combined with the latter.

Other suitable water dispersible, low melting point resins which could be used in accordance with the invention are the polyoxyalkylene derivatives of lanolins and lanolin alcohols, polyoxyalkylene derivatives of cholesterol, polyoxyalkylene derivatives of sorbitol and lanolin, polyoxyethylene sorbitan tristearate, polyoxyethylene lauryl ether and polyoxyethylene derivatives of sorbitol and beeswax.

Polyethylene glycol is the preferred water soluble resinous carrier not only because of its low melting point which permits fabrication of the swabs from a melt, but also because of its waxy nature which enables it to act as a lubricant when the applicator is used.

In use, the wad of the applicator is lightly wetted, as by dipping into a container of water, and the wetted wad is thereafter applied to the body surface desired to be treated.

The proportions of resin and medicament are obviously dependent upon the nature of the medicament and the amount which is desired at the site of application. Generally at least 40 weight percent of water soluble resin, based on the combined weight of resin and medicament is required to act as a carrier base. Amounts of resin between about 40 percent and about 99.9 percent are suitable and amounts between about 60 percent and about 99 percent are preferred.

Example I

For the treatment of acne:

Salicylic acid	-----g--	2
Hexachlorophene	-----g--	1
Polyethylene glycol 400	-----g--	20
Polyethylene glycol 4000 q.s.	-----ml--	100

Example II

For removal of cerumen:

Urea peroxide	-----g--	6
Polyethylene glycol 400	-----g--	10
Polyethylene glycol 4000 q.s.	-----ml--	100

Example III

As a styptic agent:

Alum	-----g--	50
Polyethylene glycol 4000 q.s.	-----ml--	100

3

Example IV

As an anti-inflammatory agent:

Hydrocortisone	mg	250
Phenol	g	5
Polyethylene glycol 400	g	20
Polyethylene glycol 4000 q.s.	ml	100

Example V

As a skin antiseptic:

	Grams	
Benzalkonium chloride		0.01
Polychol 15 (trademark designation for ethoxylated lanolin alcohol having about 15 ethylene oxide units)		75
Light mineral oil		15
Water		10

Example VI

As a skin antiseptic:

	Grams	
Resorcinol		1.0
Polyethylene glycol 400		1.0
Polychol 15		50.0
Polyethylene glycol 4000		48.0

Example VII

As a skin antiseptic:

	Grams	
Hyamine 1622 (trademark designation for diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride)		0.01
Water		5.0
Beeswax		50.0
Spermaceti		5.0
Mineral oil		5.0
Polyethylene glycol 4000		5.0

Other medicinal agents which may be applied to swabs in water dispersible low melting point resins in accordance with this invention include local anesthetics for topical application, such as benzocaine and butacaine; protective materials, such as zinc oxide, titanium dioxide and zirconium oxide; anti-infective or antibacterial agents, such as tetracycline, hexachlorophene, bithionol, phenol, resorcinol and neomycin; anti-histamines, such as chlorpheniramine maleate; keratolytics, such as salicylic acid; anti-fungal agents, such as salicylic acid, undecylenic acid and zinc undecylenate; astringents, such as zinc oxide and aluminum salts; and surface active agents, such as benzalkonium chloride and sodium lauryl sulfate.

Those skilled in the art will have no difficulty in determining suitable proportions of the above agents to be used from the known pharmacological properties of these agents in other media.

In addition to the advantages enumerated above, the use of this invention provides greater stability for those medicinal and other topical ingredients which are susceptible to degradation or bacterial in a wet state. In the solid anhydrous form in which the topical agents are maintained in accordance with this invention, their resistance to degradation is enhanced.

Furthermore, the use of this invention permits controlled application of topical agents and provides a practical means to avoid the application of excessive amounts of such agents, as might be the tendency with ointments and liquids.

The invention has been described as applied to preferred embodiments and it will be understood that various substitutions and changes may be effected without departing from the spirit and scope of the novel concepts and principles of this invention.

I claim:

1. A medicative applicator which comprises a stem having a wad of absorbent material affixed to at least one end thereof, said absorbent material being impregnated with a mixture comprising a medicinal ingredient

4

carried by a water dispersible low melting point resinous material.

2. A medicative applicator which comprises a stem having a wad of cotton affixed to at least one end thereof, said cotton being impregnated with a mixture comprising, by weight, a medicinal ingredient from about 0.1 percent to about 60 percent carried by a water soluble low melting point resin from about 40 percent to about 99.9 percent.

3. A medicative applicator which comprises a stem having a wad of cotton affixed to at least one end thereof, said cotton being impregnated with a mixture comprising, by weight, a medicinal ingredient from about 0.1 percent to about 60 percent carried by polyethylene glycol from about 40 percent to about 99.9 percent.

4. A medicative applicator which comprises a stem having a wad of cotton affixed to at least one end thereof, said cotton being impregnated with a mixture comprising, by weight, a medicinal ingredient from about 0.1 percent to about 60 percent carried by a polyoxyalkylene derivative of lanolin from about 40 percent to about 99.9 percent.

5. A medicative applicator which comprises a stem having a stem with a wad of absorbent material affixed to of, said cotton being impregnated with a mixture comprising, by weight, a medicinal ingredient from about 0.1 percent to about 60 percent carried by a polyoxyalkylene derivative of a lanolin alcohol from about 40 percent to about 99.9 percent.

6. The method of preparing a medicative applicator having a stem with a wad of absorbent material affixed to at least one end thereof, comprising the steps of forming a uniform liquid mixture comprising a medicinal ingredient and a melted water dispersible resin, applying said uniform liquid mixture to said absorbent material, and solidifying by cooling a resin-medicinal ingredient composition from the mixture which has been applied to said absorbent material.

7. The method of preparing a medicative applicator having a stem with a wad of absorbent material affixed to at least one end thereof, comprising the steps of forming a uniform liquid mixture comprising, by weight, a medicinal ingredient from about 0.1 percent to above 60 percent carried by polyethylene glycol from about 40 percent to about 99.9 percent, applying said uniform liquid mixture to said absorbent material, and cooling the mixture which has been applied to said absorbent material to solidify it.

8. The method of preparing a medicative applicator having a stem with a wad of absorbent material affixed to at least one end thereof, comprising the steps of forming a uniform liquid mixture comprising, a medicinal ingredient and a melt of a polyoxyalkylene derivative of lanolin, applying said uniform liquid mixture to said absorbent material and solidifying the mixture which has been applied to said absorbent material.

9. The method of preparing a medicative applicator having a stem with a wad of absorbent material affixed to at least one end thereof, comprising the steps of forming a uniform liquid mixture comprising, a medicinal ingredient and a melt of a polyoxyalkylene derivative of a lanolin alcohol, applying said uniform liquid mixture to said absorbent material, and solidifying the mixture which has been applied to said absorbent material.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

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Frederick P. Siegel

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 19, for "25% C." read -- 25° C. --;
column 4, lines 23 and 24, strike out "having a stem with a wad of absorbent material affixed to of" and insert instead -- having a wad of cotton affixed to at least one end thereof --.

Signed and sealed this 8th day of October 1968.

SEAL)

Attest:

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Commissioner of Patents