

1

2,890,151

THERAPEUTIC COMPOSITION COMPRISING POWDERED MAIZE COB

Cleveland J. White, Chicago, Ill.

No Drawing. Application February 23, 1956
Serial No. 567,073

7 Claims. (Cl. 167—58)

This invention relates to novel compositions having unexpected utility in the treatment of skin malfunctions and disorders. More particularly, it relates to the use of such compositions in the treatment of those skin conditions characterized by extensive hyperhidrosis, inflammatory exudations, secondary infections associated with the foregoing, and the like.

In the therapy of such skin afflictions, powders of one kind and another are frequently used for the intended purpose of forming a covering over and protecting the skin, at least to some extent, from air and from the friction of clothing to minimize itching and burning sensations that would otherwise be present. In those situations where the skin has not become excoriated waterproof powders are sometimes useful in effecting protections against macerations from secretions of a watery nature; such waterproof powders are dermatotropic in character and are thus especially suitable for protecting skin against irritations caused by such fluid discharges as urinary secretions and the like.

Where, on the other hand, excoriation of the skin has occurred and a "weeping" surface is present, absorbent dusting powders are preferable to the "waterproof" type because the former have a tendency to "take up" the fluid from the surface of the skin and effect some degree of drying action.

Among the absorbent powders which have been used more or less effectively in the past are starch, talcum, chalk and kaolin, and various combinations of these; unfortunately none of these powders used heretofore has been as effective as would be desirable, for reasons hereinafter pointed out. Thus, unless starch has associated with it an antiseptic component it will, in the presence of a discharge on the skin, have a tendency to cake, decompose, and thereby lose its effectiveness. Kaolin, talcum, chalk, bentonite, fuller's earth and similar mineral products also, generally have associated with them boric acid, salicylic acid or some other antiseptic in order to minimize decomposition in the absorbed discharge. However, while the use of boric acid, salicylic acid and other bactericidal and/or fungicidal additives does minimize the decomposition of the absorbed discharge, use of such products is not without disadvantages and even dangers, since some additives can and will become absorbed by the body and result in possible poisoning as has been recorded in the case of boric acid products used on infants. Because of their propensity to "cake" and/or decompose, their negligible absorptive powers and for other reasons the powder bases of the dusting powders used heretofore have not been as effectual as would be desired, particularly in the treatment of those skin conditions where moisture is present either from an inflamed surface or from areas of pronounced hyperhidrosis.

The present invention now provides, and for the first time, a composition which is surprisingly effective in the treatment of exudative lesions in which the factor of excessive fluid (inflammatory, hyperhidrotic, or infec-

2

tious) is important, and in treating, for example, exudative lesions of fungus or bacterial origin located in the intertriginous areas or on plantar surfaces of feet. My novel composition has also been found to have unexpected efficacy when used in dermatological cases where there is a marked exudative element, as fungus or "ringworm" with secondary bacterial infection. It is of symptomatic help in exfoliative dermatitis, pemphigus, exudative bullous erythema multiforme and carcinoma of skin, resulting in a high degree of symptomatic relief to the patient coupled with an extremely effective minimization of odor, as well as in the treatment of nonspecific superficial ulcerations of the skin.

In the treatment of the foregoing skin conditions, my composition, in the form of a free-flowing powder, is used as a topical application on the area being treated, the amount applied being sufficient to absorb the exudative material. Surprisingly, the composition of the present invention has been discovered to be, per se, bacteriostatic in its nature, unlike powders composed of starch and the like which cake and decompose when associated with the exudative material from the skin, unless formulated with bactericides. I have found in this connection that the application of my composition to exudative areas results in a drastic minimization of bacterial and mold growth in the treated area. Thus, it has been determined in a number of instances, that the bacteria count of a skin in contact with my product has been reduced over 90% in 36 hours, and the fungus content reduced over 87% in 48 hours.

The mildly acidic (a representative pH being about 4.3) character of the powdered cob component of my composition contributes to its compatibility with normal glabrous skin, and is a complementary advantage.

My composition, derived from the cob of maize (*Zea mays*) has a preferred particle size which ranges from approximately that which will just pass through a 100 mesh screen to that which will first be retained on a 400 mesh screen, and may be composed of the entire cob, or of components or mixtures of components thereof and including analgetic, fungicides, bactericides and the like, as will be described hereinafter.

The maize cob in transverse section comprises three zones. The outer zone, comprising approximately $\frac{1}{2}$ of the depth, is known as the glume. The intermediate zone occupying approximately $\frac{1}{4}$ of the cob is known as the "woody ring" and is positioned between the glume and the inner portion or the pith. The pith comprises about the inner $\frac{1}{4}$ of the cob.

The glume alone—known as beeswing after grinding—though it may be used in particulated form under some conditions, is ordinarily too gritty and irritating for use in contact with most skins although it may be used where this is not a factor.

The woody ring portion is generally more preferable than the glume provided that it is reduced to a particle size which is preferably not coarser than that which passes through a 100 mesh screen and preferably just passes a 200 mesh screen, although particle sizes which will even pass through a 400 mesh screen may be used if the resulting decrease in moisture absorption character of the finer product is not of too much moment.

Generally speaking one of the most desirable parts of the cob for purposes of this invention is the pith portion. The pith, as above described, when ground to a suitable particle size, e.g., such that the average diameter is about 0.0015 to 0.006 inches, will absorb up to about 24 times its own weight in moisture in a 48 hour period and is more effective in this regard, than the products formed from the woody ring portion or from the glume.

All of the foregoing ground products including the ground whole maize, the ground woody ring portion of

3

the maize cob, and the ground pith portion of the maize, whose particles have average diameter of about 0.0015 to about 0.006 inch have been successfully used in the treatment and control of exudative inflammatory secretions and body odors originating with such secretions, as well as those stemming from hyperhidrotic conditions.

While the ground maize cob itself, in the foregoing forms, performs excellently without additives, I have found that the incorporation of certain materials may be desirable in some circumstances. Thus, ground oatmeal in the amount of say, 5%, bentonite in the amount of 5%, cornstarch 5%, talcum 1% and similar additives may be added to the ground maize cob compositions of my invention, and particularly when the particle size of the maize composition is on the coarse side, appear to have a soothing effect on the irritated skin areas being treated. As mentioned hereinbefore, these materials—starch, talcum, bentonite and similar starchy or inorganic products—alone have been used in the past as “dusting powders” but invariably have caked or decomposed, or both, when used alone. In the compositions contemplated herein wherein such additives are used in admixture with the ground maize cob in accordance with my invention, no caking, crusting or decomposition results.

While, as indicated above, I have obtained outstanding results by the use of ground maize cob, alone, or with the aforementioned additives, even more surprising and unexpected results have stemmed from my use, in treating skin conditions such as are described, of ground maize cob in association or combination with bactericides, fungicides and analgetics.

The exact reasons for this are not known, although it may be that the mild buffering properties as well as the mildly acidic character of the powdered maize cob component of such compositions is responsible therefor.

Besides the ground cob itself, i.e. either the whole cob or components thereof in mesh sizes varying from that passing through a 50 mesh, and preferably a 100 mesh screen up to that passing a 400 mesh screen which can be used with gratifying results by application of the particulate material to the skin area being treated, other representative compositions which have been found to give excellent results where residual bacterial or fungus infections are involved are set forth in detail below.

In all instances where ground maize cob is specified it is pointed out that the whole cob as well as fractional components thereof such as the glume, woody ring, or pith may be used and that the particle size may vary from that passing through a 50 mesh and more preferably a 100 mesh screen up to a 400 mesh screen; the presently preferred material is that represented by the woody ring, and of a particle size such that the particles pass through a U.S. 100 mesh screen.

While certain particular bactericidal and fungicidal materials are specified for illustrative purposes it is to be understood that these are not limiting and that, of course, other specific bactericides, fungicides and analgetics may be used. And while certain amounts are specified it will be obvious to those skilled in the art that the amounts of bactericides, fungicides and analgetics used in such a powder are widely variable; generally speaking amounts over about 10% of bactericide, fungicide and analgetic based on the weight of the ground maize cob are sometimes apt to be irritating to the skin, and amounts of the order of 5% or more desirably 3% and under are preferred.

Example I

	Percent
Ground maize cob -----	98.75
Dyclonine (a fungicide and bactericide for Gram positive and Gram negative organisms) -----	1.0
Menthol -----	0.25

4

Example II

Ground maize cob -----	95.0
Erythromycin -----	1.0
Bacitracin -----	2.0
Nitrofurazone -----	2.0

Example III

Ground maize cob -----	99.5
Dequadin chloride (decamethylene-bis - 4 - amino-quinaldine chloride) -----	0.5

This composition was especially efficacious against Gram positive and Gram negative bacteria, Hypomycetes and Ascomycetes.

Example IV

	Percent
Ground maize cob -----	96.5
Benzalkonium chloride -----	2.0
Tyrothricin -----	1.0
Hexachlorophene -----	0.5

Example V

Ground maize cob -----	98.5
Acridine chloride (phenacridine chloride) -----	1.0
Dichlorophene (2,2' - dihydroxy-5,5' - dichlorodiphenylmethane) -----	0.5

Example VI

Ground maize cob -----	93.0
Thymol -----	2.0
Sodium iodide -----	3.0
Nitrofurazone -----	2.0

In practice, as already mentioned generally, my novel compositions are “dusted,” preferably in a layer on the surface of the skin to be treated, the layer being thick enough to absorb the exudate. The ground maize cob, either the glume, the woody ring, or pith portions, and in the particle sizes described, can be sterilized, with dry heat, using conventional equipment and techniques; in this condition the sterilized product has been found to remain sterile as long as 19 months.

Besides the completely unexpected efficacy of my composition in the treatment of dermatoses wherein there is an exudative product of an aqueous nature, it has also been found to be beneficial as a topical application in the treatment of oleosa seborrhea and in the control of infections associated with excessively oily skin.

It is, of course, understood that any of the convenient and well known techniques can be used in separating the glume, woody ring, and pith components of the cob from each other and that the grinding itself can be effected with conventional equipment, conveniently by means of an attrition mill operating at a speed of e.g. 1800 r.p.m. or other types of crushing machines.

My composition, in the form of a fine powder comprising the whole maize cob or the glume, woody ring and pith portions or mixtures thereof, alone as well as in admixture with bactericides, fungicides, analgetics and the like has been found to be extremely effective in the treatment of skin afflictions of the described character, is unexpectedly superior to prior art dusting powders, and is safe and simple to use.

And while my composition is described in terms of particular ingredients, particle sizes, and ranges of components, to be used, it is obvious that many modifications and variations in the nature and portions of the ingredients may be made without departing from the spirit and scope of the invention and only such limitations should be imposed as are indicated in the appended claims.

This is a continuation-in-part of my copending application Serial No. 378,690 filed September 4, 1953, now abandoned.

I claim:

1. In the treatment of exudative dermatosis the improvement which comprises maintaining that zone of

the skin where exudation occurs in contact with a finely divided composition in powder form, a major portion of which comprises at least one member selected from the group consisting of the glume, the woody ring, and the pith of maize cob, said member having a particle size such that the particles pass through a 100 mesh screen and are retained on a 400 mesh screen.

2. In the treatment of exudative dermatosis the improvement which comprises maintaining that zone of the skin where exudation occurs in contact with a finely divided composition in powder form a major portion of which is composed of at least one member selected from the group consisting of the glume, the woody ring, and the pith of maize cob, and a minor portion of a material selected from the group consisting of fungicides and bactericides.

3. A method of combating secondary infections and the development of odors associated with exudative dermatoses which comprises maintaining the exudative area of the skin in contact with a finely divided composition in powder form comprising a major portion of at least one member selected from the group consisting of the glume, the woody ring, and the pith of maize cob.

4. An improved powder for inhibiting development of infections associated with exudative dermatosis which comprises in combination a major portion of finely divided powdered maize cob, having a particle size such that the particles pass through a 100 mesh screen and are retained on a 400 mesh screen, and a minor portion of a material selected from the group consisting of fungicides and bactericides.

5. An improved powder for inhibiting the development of infections associated with exudative dermatoses which comprises in combination the finely divided woody ring component of maize cob having a particle size such that the particles pass through a 100 mesh screen and are retained on a 400 mesh screen and a material se-

lected from the group consisting of fungicides and bactericides.

6. An improved powder for inhibiting the development of infections associated with exudative dermatoses which comprises in combination the finely divided pith of maize cob having a particle size such that the particles pass through a 100 mesh screen and are retained on a 400 mesh screen and a material selected from the group consisting of fungicides and bactericides.

7. An improved powder for inhibiting the development of infections associated with exudative dermatoses which comprises in combination bees wing having a particle size such that the particles pass through a 100 mesh screen and are retained on a 400 mesh screen and a material selected from the group consisting of fungicides and bactericides.

References Cited in the file of this patent

UNITED STATES PATENTS

139,116	Connell	May 20, 1873
1,597,838	Stevens	Aug. 31, 1931
2,733,145	Karr et al.	Jan. 31, 1956

FOREIGN PATENTS

4,505	Great Britain	Dec. 24, 1875
of 1875		
361,233	Great Britain	Nov. 19, 1931
734,624	Great Britain	Aug. 3, 1955
4,529	Great Britain	of 1910

OTHER REFERENCES

Merck Index, 6th ed., Merck and Co., Rahway, N.J., 1952, pp. 112, 113 (Bacitracin) and 680 (Nitrofurazone).
 Merck Index, 5th ed., N.J., 1940, pp. 72-73.
 Morrison: Feeds and Feeding, 21st ed., N.Y., 1951, p. 495.