

UNITED STATES PATENT OFFICE

2,067,950

ARTIFICIAL MATERIAL AND METHOD OF
PREPARING THE SAMEGeorge Schneider, Montclair, N. J., assignor to
Celanese Corporation of America, a corporation
of DelawareNo Drawing. Application July 3, 1933,
Serial No. 678,927

5 Claims. (Cl. 28—59)

This invention relates to the preparation or treatment of artificial materials particularly textile materials, such as yarns or filaments made of organic derivatives of cellulose, whereby the same are rendered more amenable to textile operations or have other improved properties.

An object of my invention is to prepare or treat textile materials, particularly yarns or filaments containing cellulose acetate or other organic derivatives of cellulose by the employment of oils or fatty acids in conjunction with an aromatic compound containing an unsaturated aliphatic group, whereby the yarns or filaments are rendered more pliable and can therefore be knitted, woven or knotted more readily. Further objects of my invention will appear from the following detailed description.

It is desirable to apply finishes which soften or lubricate the yarns in many processes of conversion of textile yarns such as twisting, winding, knitting or weaving. The finishes considered most useful for this purpose contain oils, such as olive oil or castor oil. However, when such oils are applied to the yarn, upon aging they hydrolyze to develop free acid; they tend to oxidize, and to polymerize and form viscous and gummy bodies.

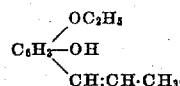
I have found that if certain aromatic compounds containing unsaturated aliphatic groups are added to such oils, yarns to which the resulting mixture has been applied, remain soft and not sticky when exposed to the air for long periods of time. Moreover, the presence of these aromatic compounds containing unsaturated aliphatic groups greatly retards the development in such oils of free acidity, prevents oxidation and largely overcomes the tendency of such oils upon ageing to render cellulose acetate yarns less resistant to the delustering action of hot aqueous liquids.

In accordance with my invention, I employ the animal or vegetable oils or the fatty acids derived therefrom in conjunction with aromatic compounds containing aliphatic unsaturated groups in the preparation or treatment of artificial materials particularly those containing cellulose acetate or other organic derivatives of cellulose.

The animal or vegetable oils employed may be any suitable one such as olive oil, castor oil, coconut oil, neat's-foot oil and in general the glycerides of the fatty acids such as oleic acid, palmitic acid or stearic acid. One of such oils or a mixture of two or more of such oils may be employed. If desired the fatty acids themselves, may be employed. These oils may be used alone or in conjunction with mineral lubricating oils as well as in conjunction with bodies having a beneficial

effect such as diethylene glycol, glycerine, etc.

In order to prevent such oils or fatty acids from oxidizing, hydrolyzing, polymerizing or otherwise becoming sticky and thus imparting harshness to the textile material, I add an aromatic compound containing an unsaturated aliphatic group thereto. Any suitable aromatic compound may be used provided it contains an unsaturated aliphatic group, such as vinyl, $\text{CH}_2\text{:CH—}$; propenyl, $\text{CH}_3\text{CH:CH—}$; allyl, $\text{CH}_2\text{:CH.CH}_2\text{—}$; crotonyl, $\text{CH}_3\text{CH:CH.CH}_2\text{—}$, etc. The aromatic compound may contain one or more other groups such as hydroxy, ether, halogen, sulfonic and other groups, such as may be obtained by substituting the unsaturated aliphatic groups for one or more nuclear hydrogen atoms in phenol, cresol, naphthol, or other phenols; catechol, resorcinol or other polyhydroxy compounds; anisol, phenetol or other ethers. I prefer however to employ the unsaturated derivatives, particularly the propenyl, allyl, vinyl and crotonyl derivatives of aromatic compounds containing both ether and hydroxy groups, such as guaethol, $\text{OH.C}_6\text{H}_4.\text{OC}_2\text{H}_5$, and guaiaacol, $\text{OH.C}_6\text{H}_4.\text{OCH}_3$. This invention will be described more specifically in connection with propenyl guaethol



The amount of propenyl guaethol, or other compound employed may be any suitable one, being usually small and on the order of 0.5 to 5% of the weight of the oils or fatty acids employed.

In one form of my invention, the vegetable or animal oils or the fatty acids in admixture with the propenyl guaethol or other aromatic compound containing an unsaturated aliphatic group may be added to the spinning dope or solution from which the yarns, filaments, artificial bristles or straw, and the like are formed, and such solution may then be extruded through orifices into an evaporative atmosphere as in dry spinning or into a precipitating bath as in wet spinning, or films or thin foils may be made from such solution.

In another form of my invention the mixture of the oils or fatty acids and the aromatic compound containing an unsaturated aliphatic group may be applied to the yarns, filaments, fabrics, films or foils after their formation. They may be applied either alone or in admixture with other materials as a lubricant or finish. Thus the lubricant or finish may also contain softening

agents such as polyhydric alcohols, examples of which are glycol, diethylene glycol or glycerine.

The textile materials or other artificial materials to be prepared or treated in accordance with this invention preferably contain organic derivatives of cellulose which may be organic esters of cellulose or cellulose ethers. Examples of such organic esters of cellulose are cellulose acetate, cellulose formate, cellulose propionate and cellulose butyrate, while examples of cellulose ethers are ethyl cellulose, methyl cellulose and benzyl cellulose.

Yarns, artificial straw or filaments when prepared or treated in accordance with this invention have great pliability due to the presence of the animal or vegetable oils or the free fatty acids, as shown by the fact that such yarns may be readily knitted into a fabric containing many stitches per unit length, and artificial bristles, horsehair and straw may be knotted quite tightly and bent quite severely without breaking. Moreover, when such yarns are exposed to the air for long periods of time, because of the presence of the aromatic compound containing unsaturated aliphatic groups, they retain their softness and pliability and can be readily knitted.

In order further to illustrate my invention, but without being limited thereto, the following specific example is given.

Example

A finish is prepared as follows:

	Parts by weight
35 Olive oil -----	99
Propenyl guaethol -----	1

The above mixture is applied to a yarn consisting wholly of acetone-soluble cellulose acetate filaments, by causing such yarn to pass over

wicks, rollers or other furnishing device for applying such mixture, in their transit from the dry-spinning machine in which they are formed to a winding device. The amount of finish applied is from 1 to 2% of the weight of the yarn.

The propenyl guaethol greatly reduces the tendency of the olive oil to polymerize upon aging, and inhibits oxidation. Moreover, while cellulose acetate yarns or fabrics treated with olive oil alone after a period of time tend to deluster 10 more readily when treated with hot aqueous fluids, the presence of the propenyl guaethol greatly reduces this tendency of delustering.

It is to be understood that the foregoing description is given merely by way of illustration 15 and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. Textile materials comprising filaments of cellulose acetate containing olive oil and propenyl guaethol.

2. A finish for artificial textile materials, comprising a glyceride of a fatty acid and propenyl 25 guaethol.

3. A finish for artificial textile materials comprising olive oil and propenyl guaethol.

4. Textile materials comprising filaments of cellulose acetate containing olive oil and a substance selected from the group consisting of the propenyl, allyl, vinyl and cotonyl derivatives of 30 guaethol.

5. A finish for textile material containing cellulose acetate, comprising olive oil and a substance selected from the group consisting of the propenyl, allyl, vinyl and cotonyl derivatives of 35 guaethol.

GEORGE SCHNEIDER.

CERTIFICATE OF CORRECTION.

Patent No. 2,067,950.

January 19, 1937.

GEORGE SCHNEIDER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 24, for "aging" read ageing; page 2, second column, lines 32 and 37, claims 4 and 5 respectively, for "cotonyl" read crotonyl; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of March, A. D. 1937.

Seal)

Henry Van Arsdaale
Acting Commissioner of Patents.

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In order further to illustrate my invention, but without being limited thereto, the following specific example is given.

Example

A finish is prepared as follows:

	Parts by weight
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Propenyl guaethol -----	1

The above mixture is applied to a yarn consisting wholly of acetone-soluble cellulose acetate filaments, by causing such yarn to pass over

wicks, rollers or other furnishing device for applying such mixture, in their transit from the dry-spinning machine in which they are formed to a winding device. The amount of finish applied is from 1 to 2% of the weight of the yarn.

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