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PROCESS OF TREATING FABRICS AND
PRODUCT THEREOF

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This invention relates to the treatment of textile fabrics and relates more particularly to the treatment of textile fabric containing yarns or filaments of organic derivatives of cellulose in order to improve their textile properties.

An object of our invention is to improve the properties of textile fabrics by treating the same with a partially polymerized vinyl compound. Other objects of this invention will appear from the following detailed description.

Often it is desirable to increase certain physical properties of textile materials such as wearing properties, stiffness, waterproofness, or diminish undesirable properties such as tendency to slip, ladder, etc. We have found that if a partially polymerized vinyl compound is incorporated in such textile fabric, particularly one containing cellulose acetate or other organic derivative of cellulose, such objects are attained.

In accordance with our invention we incorporate in a textile fabric, particularly one containing an organic derivative of cellulose, a partially polymerized vinyl compound.

The textile fabric to be treated in accordance with this invention may be in the form of a woven, knitted or netted fabric containing yarns, filaments, straw or bristles.

The textile fabric treated by this invention preferably contains yarns or filaments of organic derivatives of cellulose such as organic esters of cellulose and cellulose ethers. Examples of such organic esters of cellulose are cellulose acetate, cellulose formate, cellulose butyrate, while examples of cellulose ethers are ethyl cellulose, methyl cellulose and benzyl cellulose. However the textile fabric may consist wholly or in part of yarns of other fibres such as natural silk, reconstituted cellulose, cotton, flax, wool, or it may be a mixed fabric containing yarns of such fibres and filaments or yarns of organic derivatives of cellulose.

The partially polymerized vinyl compound employed in our invention may be formed by partially polymerizing vinyl acetate or other vinyl compounds, for instance such as may be formed by dehalogenating a vinyl halide, such as vinyl chloride, by means of zinc dust, vinyl propionate, vinyl phthalate, styrene ($C_6H_5CH=CH_2$) or any other suitable compound containing the $CH=CH_2$ group. These vinyl compounds may be partially polymerized by exposure to sunlight or ultraviolet light such as is emitted from a mercury vapor lamp, by heat or in any other suitable manner in the presence or absence of catalytic assistance such as benzoyl peroxide or uranium

salts. While the degree of polymerization of the vinyl compound employed may be varied so that it has either a jelly-like consistency or is solid, the polymerization should not proceed to the point where the product is insoluble in all organic solvents.

The partially polymerized vinyl compound may be applied while dissolved in a suitable solvent or while emulsified or colloiddally dispersed in an aqueous liquid to the woven, knitted or netted fabric by dipping, spraying and the like.

The partially polymerized vinyl compound is applied to the textile fabric whilst dissolved in a suitable solvent therefor such as benzene or toluene, or the partially polymerized vinyl compound may be applied while dissolved in benzene and/or toluene to form solutions of 0.5 to 5% concentration. If desired the partially polymerized vinyl compound may be applied as a colloidal dispersion in aqueous solutions of soaps such as olive oil soap or Turkey red oil. The partially polymerized vinyl compound is applied in amounts from 0.25 to 5% of the weight of the yarn or fabric.

In cases where it is desired to color the fabrics, suitable dyestuffs may be dissolved in the solution of the partially polymerized vinyl compound, and this may be applied to the whole fabric, or locally in any desired design of pattern by printing or spraying or brushing through stencils to obtain any desired effects. The solution or emulsion of the partially polymerized vinyl compound without any color may be locally applied to the fabric if desired.

Fabrics when treated in accordance with this invention, have many desirable properties. Such fabric has greater wearing properties, as much as 100 to 200% or more than untreated fabric as shown by a rubbing test with the Wyzenbeek and Staff precision wear test meter. Such woven fabric has less tendency to slip and such knitted fabric has less tendency to ladder than untreated fabric. Moreover such fabric does not tend to ravel as readily at cut edges as do untreated fabrics. Furthermore the fabric is stiff, and is eminently suitable for use in making the tops of fancy shoes and the like where resistance to hard wear is required. Moreover the fabric is more waterproof than the untreated fabric.

When fabric that is impregnated with the partially polymerized vinyl compound in accordance with our invention is calendered between heated rolls, a glossy finish is produced in which great adhesion between warp and weft is obtained.

In order further to illustrate our invention, but

without being limited thereto, the following specific example is given.

Example

5 A fabric of twill weave consisting wholly of yarns of cellulose acetate is impregnated with a solution of partially polymerized vinyl acetate in benzene having a concentration of 1 to 2.5%. The amount of liquor that the fabric is permitted to take up is such that the amount of partially polymerized vinyl compound remaining on the fabric is from 1 to 2.5% of the weight of the fabric. The fabric is then dried, either at atmospheric temperatures or at elevated temperatures, in a suitable manner.

10 The fabric so treated shows an increase of over 100% in wearing properties as compared by friction tests with the untreated fabric, and does not tend to slip or ravel as readily as the untreated fabric.

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

25 Having described our invention, what we desire to secure by Letters Patent is:

30 1. Method of improving the wearing properties of a textile fabric containing yarns of an organic derivative of cellulose while retaining its textile character and the individuality of the yarns, which comprises impregnating said fabric with a solution of a partially polymerized vinyl compound having a concentration of 0.5 to 5% in a solvent therefor, the fabric retaining 0.25 to 5.0% of its weight of the vinyl compound.

2. Method of improving the wearing properties of a textile fabric containing yarns of cellulose acetate while retaining its textile character and the individuality of the yarn, which comprises impregnating said fabric with a solution of a partially polymerized vinyl compound having a concentration of 0.5 to 5% in a solvent therefor, the fabric retaining 0.25 to 5.0% of its weight of the vinyl compound.

3. Method of improving the wearing properties of a textile fabric containing yarns of cellulose acetate while retaining its textile character and the individuality of the yarn, which comprises impregnating said fabric with a solution of a partially polymerized vinyl acetate having a concentration of 1 to 2.5% in benzene, the fabric retaining 1 to 2.5% of its weight of vinyl acetate.

4. Textile fabric comprising yarns of organic derivatives of cellulose, which is impregnated with a polymerized vinyl compound in an amount equal to 0.25 to 5% based upon the weight of said fabric, said yarns retaining their individuality.

5. Textile fabric comprising yarns of cellulose acetate, which is impregnated with a polymerized vinyl compound in an amount equal to 0.25 to 5% based upon the weight of said fabric, said yarns retaining their individuality.

6. Textile fabric comprising yarns of cellulose acetate, which is impregnated with a polymerized vinyl acetate in an amount equal to 1 to 2.5% based upon the weight of said fabric, said yarns retaining their individuality.

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