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CARBONIZATION OF CELLULOSE ESTERS

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This invention relates to a process for the carbonization or selective destruction of the cellulose ester portion of mixed goods, that is fabrics woven of more than one type of fiber but of which one component is a cellulose ester.

It is an object of this invention to provide a simple and economical process for the selective destruction of the cellulose ester component in a mixed fabric containing the same, whereby to produce local designs upon such fabric, of a lacy or voile character. It is a further object of this invention to provide a process for the removal of cellulose ester fiber from any mixture in which it may occur. Other and further important objects of this invention will appear as the description proceeds.

My invention is based on the discovery that polyhydric phenols, particularly those phenols in which at least two of the hydroxyl groups are in meta position as typified by resorcinol, have the property of carbonizing, attacking, or otherwise reacting with cellulose ester fiber, rendering it brittle. If the phenol is employed in sufficient concentration, say 10% or over, the fiber may be made so brittle as to be capable of being reduced to a dry powder by brushing or similar mechanical working.

Accordingly, the process of my invention consists of applying locally to mixed goods, which contain cellulose ester fiber as one component, a water-soluble polyhydric phenol in a concentration not less than 10%. Application to the fiber is best made in the form of a printing paste by the usual printing procedures. After printing, the fabric is preferably heated dry or aged with steam, the latter procedure being particularly desirable where the printing paste contains additional ingredients, for instance dyestuffs, resists or discharging agents, which are customarily developed by steam aging. After this step the fabric is dried and then subjected to mechanical working, for instance brushing, whereby the destroyed and crumbled cellulose ester fiber is removed in the form of a powder. The other components of the mixed goods, which may be silk, wool, cotton, Nylon or any other fiber except an ester of cellulose, remains intact, producing in the treated areas a lacy or voile effect.

As polyhydroxy-phenol may be selected any water-soluble phenol which has two or more hydroxy groups, and which may have other neutral substituents in the nucleus, such as methyl, nitro or halogen. Because of its economic availability, good solubility and general lack of hazard in handling, resorcinol is one of the preferred phenols for this invention. Other members of this series may, however, also be used to good advantage. Among these may be mentioned catechol, quinol, orcinol, quinitol, pyrogallol, phloroglucinol, hydroxy-quinol, tetrahydroxy-benzene, pentahydroxy-benzene, hexahydroxy-benzene, and the various nitro, halogen and methyl derivatives of the above, including especially the nitro-resorcinols and the chloro-resorcinols.

The printing paste may contain other reagents for producing various effects on the fiber, especially dyestuffs and discharge agents. The latter of course are applied only to fabric which is dyed, while the former may be applied to non-colored fabric, thereby introducing a local color, or it may be applied jointly with a discharge agent to a dyed fabric thereby producing a local color effect different from the ground color. Resists may also be added to the printing paste, in which case the printing step is followed by a dyeing operation.

The heating or aging step may be performed in a rapid ager, cottage steamer, vat color ager, or simply on the surface of a drum drier. Where steam aging is preferred, it may be performed at elevated pressure or reduced pressure, as most convenient.

Without limiting my invention, the following specific examples are given to illustrate my preferred form of procedure. Parts mentioned are by weight.

Example 1

A printing paste is made up as follows:

	Parts
Resorcinol	20.0
Water	20.0
Gum tragacanth (6%)	60.0
Total	100.0

Print on mixed cellulose acetate-viscose piece goods; dry; steam for 10 minutes at 10 lbs. pressure in a cottage steamer; run through a "brushing machine" such as is described in Textile Bleaching, Dyeing, Printing and Finishing Machinery—A. J. Hall, pages 114 to 118, whereby the cellulose acetate portion is removed as a dust, leaving a voile effect in the printed portions.

Example 2

A printing paste is made up as follows:

	Parts
Resorcinol	20.0
China clay	10.0
Water	50.0
Gum tragacanth (6%)	20.0
Total	100.0

Cellulose acetate-viscose mixed piece goods is printed and finished as in Example 1, giving the same voile effect.

Example 3

A printing paste is made up as follows:

	Parts
Resorcinol	15.0
Bentonite	15.0
Water	70.0
Total	100.0

Cellulose acetate-viscose mixed piece goods is printed and finished as in Example 1, giving a voile effect in the printed areas.

Example 4

A printing paste is made up as follows:

	Parts
Resorcinol	20.0
Anthraquinone acid color, Color Index No. 1088	2.0
Urea	15.0
Water	13.0
Gum tragacanth (6%)	50.0
Total	100.0

The above printing paste is printed on goods consisting of a mixture of cellulose acetate and viscose fibers and finished as in Example 1, giving a blue voile design that is quite striking in appearance.

Example 5

A printing paste is made up as follows:

	Parts
Resorcinol	20.0
Diethylene glycol	5.0
Water	15.0
Carob bean gum (4%)	60.0
Total	100.0

Print and finish as in Example 1, giving a voile effect in the printed areas of the fabric.

Example 6

A printing paste is made up as follows:

	Parts
Resorcinol	20.0
Sodium sulfoxylate formaldehyde	10.0
Water	10.0
Gum tragacanth	60.0
Total	100.0

The above is printed on mixed goods containing a cellulose ester fiber, dyed with a dischargeable dye, for instance the disazo dye described in Color Index No. 317, and finished as in Example 1, giving a white voile design on a blue background.

As already mentioned, the mixed goods in the above examples may contain, beside the cellulose ester, fibers of silk, wool, Nylon, viscose-process rayon, copper-ammonium-process rayon, linen, or any combination of these.

Instead of cellulose acetate, in the above examples, cellulose formate, or any other ester of cellulose may be employed.

Instead of steaming this cloth for a short time under pressure, it may be steamed a longer period at low pressure, dried in a hot flue or even aged in a vat color ager.

Many other variations in detail will be apparent to those skilled in this art, without departing from the spirit of this invention.

I claim:

1. A process for the selective destruction of the cellulose ester component of a mixed fabric containing cellulose ester fibers, which comprises treating the same with a polyhydroxy phenol.

2. A process of producing a fabric having local designs of a lacy or voile nature, which comprises treating a union fabric, of which one of the components is a cellulose ester, in local designs with a polyhydroxy phenol in sufficient concentration to render the cellulose ester fibers brittle at the treated areas, and then subjecting the fabric to mechanical treatment to remove the brittle fibers.

3. A process of producing lacy or voile effects on union fabrics comprising cellulose ester fibers as one component, which comprises applying to the fabric locally a printing paste containing a polyhydroxy-phenol in concentration not less than 10% by weight of the paste.

4. A process of producing local designs of lacy or voile character upon union fabrics containing a cellulose ester as one of the component fibers, which comprises printing said fabric with a printing paste containing a polyhydroxy phenol in concentration not less than 10% by weight of the printing paste, then aging the fabric, drying it and subjecting the dried fabric to mechanical brushing whereby to remove brittle fibers in the areas treated with said printing paste.

5. A process as in claim 4, wherein the printing paste contains further a member selected from the group consisting of dyestuffs and discharging agents, whereby to modify the color of said local designs simultaneously with the destruction of the cellulose-ester component.

6. A process as in claim 4, the polyhydroxy phenol being a meta-dihydroxy phenol.

7. A process as in claim 4, the polyhydroxy phenol being resorcinol.

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