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H. DREYFUS

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TREATMENT OF FABRICS

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Fig. 1.

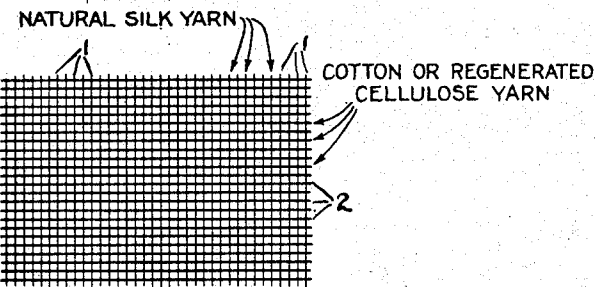


Fig. 2.

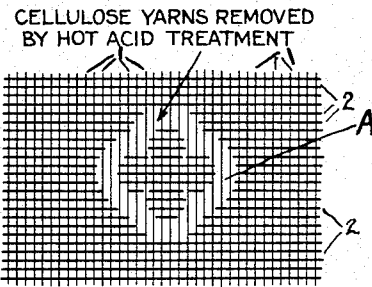


Fig. 3.

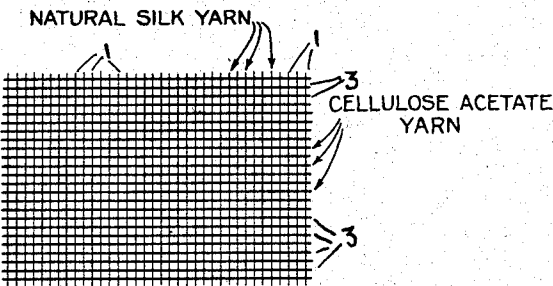


Fig. 4.

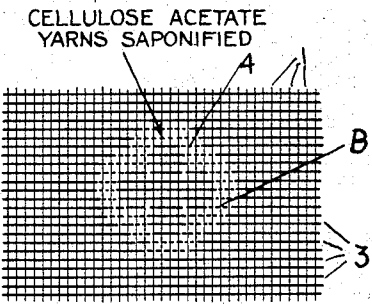
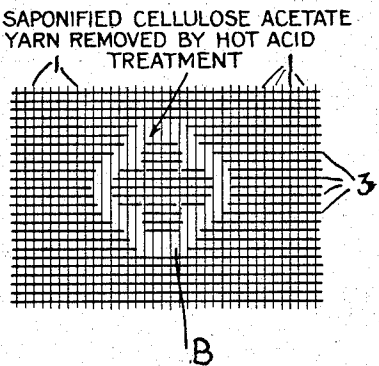


Fig. 5.



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UNITED STATES PATENT OFFICE

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TREATMENT OF FABRICS

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12 Claims. (Cl. 41-41)

This invention relates to improved processes for the treatment of fabrics and in particular the treatment of fabrics made of cotton or other cellulosic fibres or containing cotton or other cellulosic fibres in association with cellulose derivatives, for example cellulose acetate or other cellulose esters or cellulose ethers or with animal fibres, for instance wool or silk.

The object of the present invention is to provide new or improved processes for the removal of the cotton or other cellulosic fibre partly or wholly from such fabrics, and more particularly the invention is concerned with new processes for the production of ornamental effects, for instance lace, brocade or raised figure effects, on such fabrics. Hitherto in processes concerned with the removal of cotton or other cellulosic fibres from materials containing cotton and animal fibres the fabric has been printed or impregnated with a chemical reagent, for instance aluminium sulphate, aluminium chloride or hydrochloric acid, and has thereafter been subjected to the action of heat, for example in carbonizing dryer at 110-130° C., whereby the chemical destroys the cellulosic threads. In British Patent specification No. 274,074 similar effects are produced in mixed fabrics containing cellulose and cellulose derivatives.

I have now found that the cellulosic threads may be removed by treating the fabric in a hot bath containing aluminium chloride, aluminium sulphate, hydrochloric acid, sulphuric acid, ferric chloride or other mineral acid or acid salt or a salt having an acid reaction, and thereafter removing the disintegrated threads in any suitable manner, as for example by washing or brushing.

The baths may contain the acidic substance in solution in water or in organic liquids having no deleterious effect upon the animal fibres or cellulose derivatives, or in solution in a mixed aqueous organic solvent. For example in the case of animal fibres the acidic substances may be employed in solution in organic acids, for example acetic acid.

Local effects, for example the local removal of pile or plush, may be obtained according to the present invention by first applying to the fabric consisting of or containing cotton or other cellulosic fibre a suitable substance adapted to reserve the fibre against the action of the acidic substances. When the fabric is thereafter treated in a hot bath containing the acidic substance only the cellulosic fibres in the unreserved portions will be disintegrated and rendered removable,

I have found that quite efficient disintegration of the cellulosic fibres may be obtained, for example, by treating the materials for about 1 to 3 hours in a boiling bath containing relatively low concentrations of acidic substance, for example 2-3% of aluminium chloride, hydrochloric acid, sulphuric acid or ferric chloride. Higher concentrations e. g. 5, 10, 20 or even 40% or more, particularly of the acidic salts, may be used. Moreover, with greater concentrations lower temperatures or shorter times may be employed if desired. As is well known some cellulose acetate materials are liable to be delustered when treated in boiling aqueous baths, and to avoid such delustering, if delustering is not required, the temperature of the bath in treating materials containing cellulose acetate may be below the delustering temperature, or alternatively substances may be added to the baths to prevent such delustering, for example sodium sulphate, or other neutral salts or other salts or sugars, (see for example United States Patents Nos. 1,756,531 and 1,808,061).

According to a modification of the invention, by employing the principle of British Patent specification No. 302,363, namely by effecting a preliminary local saponification, the processes of the present invention may be applied to the removal of cellulose acetate or other cellulose ester from fabrics made of or containing them.

The fabrics treated according to the present invention may be coloured in any desired manner. For example, to colour portions reserved as described above, suitable colouring matters may be incorporated in the reserve; or again the reserved portions may be subsequently coloured. Two or multi-colour effects may be obtained on mixed fabrics by taking advantage of the different dyeing affinities of the fibres used in association. If a mordant metal salt such as aluminium chloride, aluminium sulphate or ferric chloride, be applied according to the present invention under such conditions that mordanting of the reserved fibres or of the fibres such as animal fibres or cellulose derivatives which are unattacked by the acidic substances, then such mordanted fibres may afterwards be coloured with suitable mordant dyestuffs.

The following examples illustrate the best methods known to me for carrying the invention into effect, but are not to be considered as limiting the invention in any way:—

Example 1

A mixed natural wool-cotton fabric is boiled

in an aqueous solution of hydrochloric acid of 2-3 per cent. strength for 2-3 hours or until the cotton fibre is readily removable, as for example by washing, brushing or the like.

Example 2

A mixed fabric containing cellulose acetate, natural wool and cotton is heated at 95° C. in an aqueous solution of ferric chloride, containing 10 per cent. of Glauber's salt, of 3-5 per cent. concentration, for 2-3 hours or until the cotton is readily removable. After the removal of the cotton the fabric may be dyed with mordant dye-stuffs to fix therein an iron lake.

Example 3

A mixed cellulose acetate natural silk pile fabric having a pile of cellulose acetate is printed in any desired manner with a saponifying paste consisting of 10% caustic soda solution thickened with an equal weight of gum tragacanth and is quickly dried. The saponifying paste is then removed and the fabric is thereafter treated as described in Example 2 for the removal of the pile which has been saponified.

In the accompanying drawing in which like reference numerals refer to similar parts

Figure 1 shows a fabric woven with natural silk yarns, 1, in the warp and cotton or regenerated cellulose yarns, 2, in the weft.

Figure 2 shows the fabric of Figure 1 after certain portions, A, of the cotton or regenerated cellulose yarns have been removed by the local application of the hot acid locally.

Figure 3 shows a fabric woven with natural silk yarns, 1, in the warp and cellulose acetate yarns, 3, in the weft.

Figure 4 shows the fabric of Figure 3 after a certain portion, B, of the cellulose acetate yarns has been saponified by the local application of a saponifying agent, the saponified portions of the cellulose acetate yarn being shown at 4.

Figure 5 shows the fabric of Figure 4 with the saponified portion, B, of the cellulose acetate yarns removed by the hot acid treatment.

It is to be understood that the following description of the invention is merely illustrative.

What I claim and desire to secure by Letters Patent is:—

1. Process for the removal of cellulosic fibres from fabrics, which consists in treating mixed materials in a hot bath having an acid reaction and containing an anion of an inorganic acid until the cellulosic fibres are rendered removable by the action of said bath, and mechanically removing the same.

2. Process for the production of effects on fabrics, which consists in treating mixed materials containing cellulosic fibres in a hot bath having an acid reaction and containing an anion of an inorganic acid until the cellulosic fibres are rendered removable by the action of said bath, and mechanically removing the same.

3. Process according to claim 2, in which the treatment is applied at substantially the boiling point of the bath.

4. Process for the production of effects on fab-

rics which consists in treating mixed materials containing cotton in a hot bath having an acid reaction and containing an anion of an inorganic acid until the cotton fibres are rendered removable by the action of said bath, and mechanically removing the same.

5. Process for the production of effects on fabrics which consists in treating mixed materials containing cotton in a hot bath having an acid reaction and containing a halide ion until the cotton fibres are rendered removable by the action of said bath, and mechanically removing the same.

6. Process for the production of effects on fabrics which consists in treating mixed materials containing cotton in a hot bath containing ferric chloride until the cotton fibres are rendered removable by the action of said bath, and mechanically removing the same.

7. Process for the production of effects upon fabrics which consists in subjecting mixed materials containing fibres comprising organic esters of cellulose at least in selected areas to the action of a reagent which will saponify the cellulose ester, and then treating the materials in a hot bath having an acid reaction and containing an anion of an inorganic acid until the cellulosic fibres are rendered removable by the action of said bath, and mechanically removing the same.

8. Process for the production of effects upon fabrics which consists in subjecting mixed materials containing fibres comprising cellulose acetate at least in selected areas to the action of a reagent which will saponify the cellulose acetate, and then treating the materials in a hot bath having an acid reaction and containing an anion of an inorganic acid until the cellulosic fibres are rendered removable by the action of said bath, and mechanically removing the same.

9. Process according to claim 8 in which the bath contains a concentration of less than 5% of the substance which imparts the acid reaction thereto.

10. Process according to claim 8 in which substances which prevent delustering of the cellulose acetate fibres are present in the treatment bath.

11. Process for the production of effects upon fabrics which consists in subjecting mixed materials containing fibres comprising cellulose acetate at least in selected areas to the action of a reagent which will saponify the cellulose acetate, and then treating the materials in a hot bath having an acid reaction and containing a halide ion until the cellulosic fibres are rendered removable by the action of said bath, and mechanically removing the same.

12. Process for the production of effects upon fabrics which consists in subjecting mixed materials containing fibres comprising cellulose acetate at least in selected areas to the action of a reagent which will saponify the cellulose acetate, then treating the materials in a hot bath containing ferric chloride until the cellulosic fibres are rendered removable by the action of said bath and mechanically removing the same.

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