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PRODUCTION OF PATTERN EFFECTS ON TEXTILE AND OTHER MATERIALS

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This invention relates to the treatment of textile and other materials and more particularly to the production of pattern effects on textile materials.

In the production of pattern effects on textile materials a much used method is to print the materials, either before or after application of a ground colouration, with an agent, generally an oxidizing or reducing agent, which will discharge the ground colouration. Usually it is necessary to bring about reaction between the discharging agent and the ground colouration by subjectng the material to steaming or other after-treatment. As a variation, colouring matters resistant to the discharging agent and having an affinity for or capable of being fixed on the materials may be incorporated in the discharge preparation whereby coloured effects are obtained on a coloured ground. In the latter case a relatively lengthy steaming is generally required to fix satisfactorily the colouring matter on the discharged portions.

Examples of substances which may be employed for the discharge of colouring matters are, among reducing discharges, stannous salts, titanous salts, and aldehyde sulphoxylates, while chlorates and chromates are examples of substances which discharge by oxidation. Some of these discharging agents however, either have an acid reaction or tend to develop acidity during the steaming or other after-treatment, or are employed in the presence of acid. Thus for example stannous chloride which is an excellent discharging agent for use in the production of discharge effects on materials made of or containing cellulose acetate or other cellulose esters or ethers as well as on other textile materials is strongly acid and tends to liberate hydrochloric acid during steaming treatment. This acid has a tendering effect on many textile materials and indeed in some cases, for example where natural silk is printed and steamed, the resultant loss in tensile strength may be of the order of 80%.

It has now been found that the deleterious effects of acid present or produced during the production of discharge effects on textile materials may be very considerably reduced if an organic base such for example as urea is present. The presence of the organic base is particularly beneficial in cases where the materials are subjected to a relatively long ageing or steaming treatment, especially the latter, for instance to ensure fixation of colouring matters. Moreover it has been found that the urea or like base may be applied in admixture with discharging agents, for example, stannous salts, without materially influencing the discharging action of the latter.

Thus in the production of coloured discharges on natural silk by applying stannous chloride preparations and ageing and steaming, addition of urea may reduce to less than one quarter the loss in tensile strength of the silk which may otherwise be experienced.

A wide variety of organic bases may be utilized in accordance with the present invention, the compounds employed being preferably of a relatively weakly basic character. Thus for example aromatic bases may be employed, e. g. aniline and substituted anilines, aralkylated aromatic bases, such for example as benzyl ethyl aniline, heterocyclic compounds for example pyridine or quinoline, or aliphatic compounds, e. g. urea and derivatives of urea, e. g. alkyl derivatives of urea for example dimethyl urea, urethanes, the ethanolamines e. g. triethanolamine, and like bodies. Water-soluble bases may very advantageously be used substantially colourless bases being preferred.

The proportions in which the organic base is incorporated in the discharge preparation may vary within wide limits. For example a considerable reduction in the loss of tensile strength observed in printing silk fabrics is obtained by incorporating 10% of urea in a discharge preparation containing 15% of stannous chloride, but higher proportions for example, 20%, 30% or more may be employed if desired.

Any other desired substances may also be present in the discharge preparation. Thus for example in printing cellulose derivative materials it is often advantageous to incorporate swelling agents, such for example as thiocyanates, phenols alcohol, hydroquinone, and thickening agents in the printing preparation. Furthermore, dyestuffs resistant to the discharging agent may be incorporated in the printing preparation, for example anthraquinone dyestuffs. For example stannous discharges may be coloured with anthraquinone dyestuffs in unreduced condition in the manner described in U. S. application S. No. 518,897 filed 27th February, 1931. Many basic colouring matters of the di- and triarylmethane, azine, oxazine and thiazine series are also resistant to stannous chloride and may be used similarly.

The discharge preparations may be applied by any suitable method of local application, and where the expression "printing" is employed in this specification it is to be understood that other

methods of local application, for example stencilling, may also be employed. Again, the urea or other organic base may be applied separately from the discharge composition, for example by padding before or after application of the discharge composition and before steaming, ageing or like moist heat treatment.

If desired other means adapted to minimize tendering of the material, may be employed in addition. Thus for example the material may be treated with ammonia gas after printing and a preliminary drying and ageing but before any lengthy steaming or ageing such as that necessary to fix colouring matters present in the discharge composition on the material.

The organic base, in addition to its action in reducing tendering may exercise other effects, for instance on the lustre of the material. For example the delustring action of steam on cellulose acetate material may be facilitated or increased, so that a delustred pattern is obtained on a lustrous ground. Thus for example delustred white or coloured discharge effects may be obtained on a cellulose acetate material by the application locally of a stannous discharge composition containing 30% of urea and drying and steaming. Where it is desired to obtain delustred effects in this manner, it is preferable to employ gum tragacanth rather than gum arabic for thickening the discharge composition. The following examples illustrate the invention without being in any way limitative.

Example I

A fabric wholly composed of natural silk and coloured with a dyestuff dischargeable by stannous chloride is printed with the following composition:—

	Parts by weight
Stannous chloride	15
Methylated spirits	10
Urea	30
Sodium thiocyanate	5
Citric acid	1
Gum arabic (1:1) or Gum tragacanth (10%)	29
Water	10
	100

After printing the fabric is dried, aged, and steamed for 10 minutes in a cottage steamer. A white printed discharge is obtained on a coloured ground, the tensile strength of the material being very considerably less affected than is the tensile strength of a silk fabric similarly treated but with the discharge composition containing no urea.

Example II

A fabric containing both natural silk and cellulose acetate and dyed with dyestuffs dischargeable by stannous chloride is printed with a composition containing:—

	Parts by weight
Stannous chloride	10
Methylated spirit	10
Sym-dimethyl urea	20
Sodium thiocyanate	5
Gum arabic thickening	55
	100

and is then dried and steamed in a Mather and Platt ager, washed off and again dried. Excellent discharge effects are obtained without the tendering of the fabrics which frequently occurs when acid discharging agents are employed in the production of discharges on textile materials containing natural silk.

While the invention has been described more particularly with reference to the colouration of silk or cellulose acetate materials, it is also applicable to other textile materials for example materials containing other organic esters of cellulose, e. g. cellulose formate, cellulose propionate, or cellulose butyrate, or cellulose ethers, for instance methyl cellulose, ethyl cellulose, or benzyl cellulose. Similarly the invention is of great value in the production of white or coloured discharge effects on regenerated cellulose material, cotton materials, and of materials containing animal fibres, for example wool. The invention is not of course limited to the treatment of materials containing one type of fibre only but is equally applicable to mixed materials for example on mixed materials containing cellulose acetate and natural silk.

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

1. Process for the production of pattern effects on materials, which comprises discharging a ground color thereon by means of substances selected from the group consisting of stannous and titanous chloride salts, while restricting acidity by means of an organic base.

2. Process for the production of discharge effects on materials colored with a dischargeable ground color, which comprises applying to the materials preparations prepared with an organic base and a substance selected from the group consisting of stannous and titanous chloride salts.

3. Process for the production of discharge effects on materials colored with a dischargeable ground color, which comprises applying to the materials preparations prepared with an organic base and stannous chloride.

4. Process for the production of discharge effects on materials colored with a dischargeable ground color, which comprises applying to the materials preparations prepared with an organic base and stannous chlorthiocyanate.

5. Process for the production of pattern effects on materials, which comprises discharging a ground color thereon by means of substances selected from the group consisting of stannous and titanous chloride salts, while restricting acidity by means of a colorless organic base.

6. Process for the production of pattern effects on materials, which comprises discharging a ground color thereon by means of substances selected from the group consisting of stannous and titanous chloride salts, while restricting acidity by means of a urea.

7. Process for the production of discharge effects on materials colored with a dischargeable ground color, which comprises applying to the materials preparations prepared with urea and a substance selected from the group consisting of stannous and titanous chloride salts.

8. Process for the production of discharge effects on materials colored with a dischargeable ground color and consisting at least in part of organic derivatives of cellulose, which comprises applying to the materials preparations prepared with an organic base and a substance selected from the group consisting of stannous and titanous chloride salts.

9. Process for the production of discharge effects on materials colored with a dischargeable

ground color and consisting at least in part of natural silk and organic derivatives of cellulose, which comprises applying to the materials preparations prepared with an organic base and a substance selected from the group consisting of stannous and titanous chloride salts.

10. Process for the production of discharge effects on materials colored with a dischargeable ground color and consisting at least in part of cellulose acetate, which comprises applying to the materials preparations prepared with an organic base and a substance selected from the group consisting of stannous and titanous chloride salts.

11. Process for the production of discharge effects on textile materials colored with a dischargeable ground color and containing both natural silk and cellulose acetate, which comprises applying to the materials preparations prepared with stannous chloride and urea.

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