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PRODUCTION OF TEXTILE MATERIALS

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2 Claims. (Cl. 28—1)

This invention relates to the production and treatment of textile materials and particularly to the production of crêpe fabrics containing yarns of regenerated cellulose.

The production of crêpe effects on fabrics containing both high twist yarns of regenerated cellulose and high tenacity yarns of regenerated cellulose has hitherto presented great difficulty. Treatment of such fabrics in hot aqueous baths, for example boiling soap solutions, does not cause the cockling of the high twist yarns necessary to produce a well marked crêpe effect. The present invention provides a solution to this difficulty.

According to the invention crêpe effects are produced on fabrics containing both high twist yarns of regenerated cellulose and high tenacity yarns of regenerated cellulose, by treating the fabric with an aqueous liquid containing a strongly alkaline substance in such concentration and for such time as to cause the desired cockling of the high twist yarns of the fabric. By high tenacity yarns are meant yarns of tenacity at least 1.75 grams per denier. The advantages of the invention are more pronounced the higher the tenacity of the high tenacity yarns.

The process of the invention is of particular advantage in the treatment of fabrics in which both weft and warp are composed of high tenacity regenerated cellulosic yarns. The process is also of advantage, however, when only one component of the fabric is of high tenacity, for example in treating a fabric having a warp of low twist high tenacity regenerated cellulosic yarn filled with a weft of high twist regenerated cellulosic yarn of normal tenacity. Georgette effects may be produced by treating fabrics both the weft and warp of which are high twist regenerated cellulosic yarn of high tenacity.

The high tenacity regenerated cellulosic yarn may be made, for example, by stretching a yarn of an organic ester of cellulose and saponifying the stretched yarn. The stretching may be effected under the influence of wet steam or hot water as described, for example in U. S. applications S. Nos. 121,150, 121,151 and 121,152 all filed on January 18, 1937, and S. Nos. 123,104, 123,105 and 123,106 all filed on January 30, 1937, or the regenerated cellulosic yarns of high tenacity may be made by a wet spinning process carried out under such conditions as to produce a high tenacity yarn. The tenacity of the regenerated cellulosic yarn may be as high as 2 grams per denier or even considerably higher, e. g. 2.5–3 or 4 or even 5 grams per denier.

The treatment with the strongly alkaline substance may be effected with the aid of caustic soda, caustic potash or other strong inorganic bases, or strong organic bases, e. g. mono- and di-methylamine, mono-, di- and tri-ethylamine, ethylene diamine and quaternary ammonium compounds as, for example, tetramethyl ammonium hydroxide and trimethyl benzyl ammonium hyroxide. The strongly alkaline substances are preferably employed in aqueous solution and at room temperature. A suitable concentration in the case of caustic soda or caustic potash is a 4–10% aqueous solution, particularly good results being obtained with a concentration of about 6%. In the case of organic bases the concentration may be such as will have a softening action on the fabric comparable with that of a 5% caustic soda solution.

The treatment is preferably effected by a bath treatment but it may also be effected by padding the fabric with the solution of the strongly alkaline substance. The fabrics may be subjected to a scouring treatment, e. g. in an aqueous soap solution, before the treatment with the strongly alkaline substance, and subjected to the treatment with the strongly alkaline substance while they are still wet from such scouring treatment. If desired, a treatment with a hot aqueous liquid may follow the treatment with the strongly alkaline substance.

Instead of using concentrations of the strongly alkaline substance of the order indicated above, lower concentrations may be used at higher temperatures.

The duration of the treatment with the strongly alkaline substances necessary to obtain the optimum results varies with the nature of the fabric and the nature and concentration of the strongly alkaline substance. However, a treatment at room temperatures for a period of 5–20 minutes, e. g. about 10 minutes, is usually very satisfactory.

At the conclusion of the treatment with the strongly alkaline substance and any subsequent treatment in a hot aqueous liquid, the fabric may be treated with an agent adapted to neutralise the alkaline substance remaining on the fabric. A suitable method is to treat the fabric with dilute acetic acid and thereafter to wash the fabric in running water.

The following examples illustrate the invention:

Example 1

A fabric both the warp and the weft of which are composed of 55 denier regenerated cellulosic yarn obtained by the complete saponification of cellulose acetate yarns stretched under the influence of wet steam or hot water to about ten times its original length and having a twist of 70 turns per inch is scoured on the jig with 5% soap solution under minimum tension and thereafter immersed for about ten minutes in an aqueous bath containing about 60 grams per litre of caustic soda at ordinary temperature. The material is then removed from the bath, soured in dilute acetic acid and finally washed in running water and dried.

Example 2

The process is carried out as in Example 1 except that the fabric treated has a low twist warp of 55 denier regenerated cellulosic yarn and a weft of the same yarn having a twist of 78 turns per inch, the regenerated cellulosic yarn in each case being made by the complete saponification of cellulose acetate yarn which has been stretched under the influence of wet steam or hot water to about ten times its original length.

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

1. Process for the production of crepe effects on fabrics containing high twist yarns of regenerated cellulose and high tenacity yarns of regenerated cellulose, said high tenacity yarns having been made by stretching yarn of an organic ester of cellulose under the influence of wet steam or hot water and completely saponifying the stretched yarn, which comprises treating the fabric for 5 to 10 minutes at ordinary temperature with an aqueous solution of an alkali metal hydroxide in a concentration of 4 to 10% so as to cause said high twist yarns to cockle.

2. Process for the production of crepe effects on fabrics containing yarns of regenerated cellulose having a twist of about 70 turns per inch and high tenacity yarns of regenerated cellulose, said high tenacity yarns having been made by stretching cellulose acetate yarn under the influence of wet steam or hot water to about 10 times their original length, and completely saponifying the stretched yarn, which comprises immersing the fabric for about 10 minutes in an aqueous bath containing about 60 grams per liter of caustic soda at ordinary temperature so as to cause said high twist yarns to cockle.

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CERTIFICATE OF CORRECTION.

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RALPH JAMES MANN, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 20, for "5%" read --6%--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of July, A. D. 1941.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.