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TREATMENT OF TEXTILES

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6 Claims

ABSTRACT OF THE DISCLOSURE

There is provided a process for the production of a woven textile material. To the textile material is applied a textile assistant which is soluble in halogenated hydrocarbon solvents. The textile assistant is applied either during or prior to the weaving of the textile material. After weaving, the textile material is immersed in a halogenated hydrocarbon solvent which dissolves and removes the textile assistant from the woven textile. Thereafter, any halogenated hydrocarbon solvent adhering to the woven textile is removed by contacting the textile with hot water or steam. As a preferred feature, the solvent is removed by immersion of the textile in a hot water bath which also contains a dyestuff for the textile material.

This invention relates to a process for the treatment of textile materials and more particularly to process improvements or modifications which can be used in conjunction with the securing of textile materials with organic solvents.

It is known, for example in U.K. specification Nos. 812,984 and 916,338 to treat textile materials with an organic solvent, particularly a chlorinated hydrocarbon solvent, in order to clean them. This procedure is sometimes termed a solvent scouring treatment. In such a process the textile material is passed through a bath of organic solvent, under conditions which enable contamination to be removed from the textile materials, and then the treated textile material laden with solvent is passed through an apparatus in which the solvent is evaporated and recovered. This final stage, commonly termed the "flash-off stage," may be carried out using hot water or steam.

We have now found that this procedure is especially useful when carried out in conjunction with either or both of the following features:

(1) Use of textile assistants (for example sizes, lubricants, spin finishes or other materials) which can be applied, prior to or during the weaving of the textile materials, from an organic solvent medium. Such textile assistants may be applied in the form of a solution or dispersion or a melt as may be appropriate.

(2) Dyeing the material while it is in an open and absorbent condition by including a dyestuff in the water used in the flash-off system.

Either of these features can be used with advantage, but it is especially advantageous to combine a solvent scour with both the features mentioned so as to produce a composite process. It may be of course that the weaving is carried out by one operator and the subsequent treatments (scouring, etc.) are carried out by another; accordingly it is most likely that the composite machine will include only the stages of solvent scouring, flash-off solvent and dyeing.

By using textile assistants which are entirely removable by means of the organic solvent we find that the solvent scouring stage can remove practically all contamination from the textile material and leave it in such

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a conditions that, after the adherent organic solvent is removed, it is thoroughly clean and in an excellent condition for dyeing.

When the textile assistants used in the weaving of the textile material are not entirely solvent-soluble, there may be a tendency for any residues remaining on the cloth after the solvent scouring stage to interfere slightly with the efficiency of the dyeing stage, though in many cases this may not be of more importance than slightly decreasing the efficiency of dyestuff usage.

Suitable textile assistants for application to the textile material before weaving or during weaving include any of the conventional materials which are soluble or dispersible in organic solvents, for example, oils, fats and waxes, and also polymeric materials of various types, for example, polyvinyl acetate types, polyvinyl acetals, polymethyl methacrylate and chlorinated rubber. These may be applied to textiles materials in the form of yarns, fibres, filaments, and the like before weaving. Many materials which have valuable properties as textile assistants, particularly in connection with some of the newer synthetic textile materials, are seldom used at the present time because it is so difficult to remove them by aqueous scouring after the weaving operation is complete. In the process of our present invention, we find that removal after weaving presents no difficulty when the solvent scouring technique is used. Paraffin waxes may be mentioned in particular as an example of a lubricant of this type.

By the process of our invention, the textile assistants (e.g. sizes) will be removed as part of the solvent scouring operation, thus eliminating the need for a separate scouring step. If desired, they may be recovered from the organic solvent solutions produced in the scouring operation.

Moreover, in the case of textile materials which are at all sensitive to water or aqueous solutions, our process has the advantage that the only aqueous solutions used are those such as would in any event be encountered in a dyeing operation; since these can be relatively mild compared with those necessary for aqueous scouring, the textile materials benefit considerably from the use of our techniques. In addition the contaminants (oils, grease, etc.) and the textile assistants, can be dealt with and retained in concentrated form and not turned out in the form of aqueous wastes.

The solvents and techniques which can be used for the solvent scouring stage may be particular any of those described more fully in U.K. specifications Nos. 812,894; 916,338; 747,481; 749,705; 812,893; 844,943; 825,402 and patent applications Nos. 38,216/64 and 9,975/65. Thus the solvent may be in particular trichloroethylene, perchloroethylene, 1,1,2-trichloro - 1,2,2 - trifluoroethane or mixtures thereof. The choice of solvent to be used depends very much upon the particular textile material concerned and the solvent is best chosen so that its solvent properties and boiling point are such that its use will not adversely effect the textile material. In particular, it may be appropriate to use a low-boiling solvent, for example 1,1,2 - trichloro - 1,2,2 - trifluoroethane, in the case of textile materials which are particularly sensitive to heat or solvent action.

The dyeing stage may involve the use of any of the conventional dyestuffs and dyeing assistants known in the art, and these may be selected appropriately to the fabric blend concerned. The temperature of the flash-off bath, and the time for which the textile materials are immersed in it may be varied within wide limits as may be appropriate to the particular materials involved. After emerging from the aqueous flash-off bath, the textile materials containing the dyestuff may be subjected to

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any of the known procedures appropriate to the dyeing operation concerned.

Textile materials which may be treated by the process of our present invention includes those made of cotton, and other cellulosic materials, wool, linen, regenerated cellulose and a variety of other natural and artificial materials including nylons, polyester, polypropylene, esterified cellulosic materials such as acetate rayon, and acrylic fibres, and mixtures of natural and/or artificial materials. The textile materials may be in the form of webs or sheets, either woven or non-woven as may be desired.

What we claim is:

1. A process for the production of a woven textile material consisting essentially of applying to the textile material, either prior to or during weaving thereof, a textile assistant chosen from the group which is soluble in a halogenated hydrocarbon solvent, weaving the textile, immersing the woven textile in a halogenated hydrocarbon solvent which dissolves and removes the said textile assistant from said woven textile and removing any halogenated hydrocarbon solvent adhering to said woven textile by contacting the woven textile with hot water or steam.

2. The process of claim 1 wherein the woven textile

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material is immersed in a hot water bath which also contains a dyestuff for said textile material.

3. Process as claimed in claim 1 wherein the solvent is trichloroethylene, perchloroethylene or 1,1,2-trichloro-1,2,2-trifluoroethane.

4. Process as claimed in claim 1 wherein the textile assistant is a halogenated solvent-soluble polymeric material.

5. Process as claimed in claim 1 wherein the textile assistant is an oil, fat or wax.

6. Process as claimed in claim 5 wherein the textile assistant is a paraffin wax.

References Cited

UNITED STATES PATENTS

2,549,014 4/1951 Romeyn ----- 8-138

FOREIGN PATENTS

600,765 6/1960 Canada.
603,285 8/1960 Great Britain.
968,399 9/1964 Great Britain.

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