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SLIPPROOF FABRIC

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5 Claims. (Cl. 91—68)

This invention relates to a process for making loosely woven fabrics slip-proof. It relates more particularly to the treatment of linen, silk, cellulose acetate and regenerated cellulose fabrics with the phosphates of trivalent metals.

Textile fabrics of comparatively loose weave, particularly those made from regenerated cellulose, linen, silk, cellulose acetate and fabrics containing more than one type of fiber, have the disadvantage that the warp and fill threads slip over each other very easily. It has now been found that the resistance to slipping of such fabrics can be increased considerably by treating them with aqueous solutions containing a trivalent metal, such as iron, chromium or aluminum, about the chemically equivalent amount of phosphoric acid and a small amount of oxalic acid. Such solutions probably contain complex compounds. They are prepared very easily by dissolving the water-insoluble phosphate of the trivalent metal in an aqueous solution of oxalic acid. In the preparation of these solutions it is not necessary to start with pure phosphates but they may be prepared by treating the solution of a water-soluble salt of a trivalent metal in oxalic acid with a water-soluble phosphate, for example sodium phosphate.

The most satisfactory manner in which these solutions can be used is to prepare a concentrated stock solution which can then be diluted to the desired concentration prior to use. The following stock solutions have been found to be advantageous:

1. 24 parts of ferric phosphate, 26 parts of crystalline oxalic acid dissolved in 50 parts of water.

2. 39 parts of anhydrous chromium sulfate and 38 parts of crystalline oxalic acid are dissolved in 150 parts of hot water and to this solution there is added slowly 79 parts of crystalline disodium phosphate.

3. 22 parts of anhydrous aluminum phosphate and 17 parts of crystalline oxalic acid are dissolved in 61 parts of water. The relative amounts of trivalent phosphates and the oxalic acid may be varied. If desired, the solutions thus prepared may be evaporated carefully in order to prepare dry products suitable for packing and shipping.

One particular advantage of these solutions is that they can be used at ordinary temperatures and thus dyed fabrics which bleed easily can be treated with them. Very small amounts of the products suffice when dissolved in water to give very good results. Application is simple, for example, it is sufficient to dip the fabrics only for a very short time following which they are squeezed and dried.

The fabrics treated with these materials do not show any tackiness or brittleness as is often the case with fabrics which have been treated with resin-soaps for the purpose of increasing their resistance to slipping. Furthermore, there is no after-hardening. The fabrics treated according to the present invention for the purpose of increasing their resistance to slipping are much more resistant to soap than are those treated with resin-soaps or similar products.

The fabric is not damaged in any way, even when the acidic bath is not neutralized. It is advantageous, however, in many instances to reduce the acidity of the bath by the addition of ammonia. By such treatment the resistance to slipping is still further increased. Treating baths containing the phosphates of trivalent elements and the oxalic acid having a pH of about 3 to about 6 have been found most satisfactory.

These products can be used alone or in connection with other finishing media, such as starch for example.

The invention may be illustrated by the following examples but it is not limited to the exact conditions of concentration, temperature and materials shown as it may otherwise be practiced within the scope of the appended claims.

Example 1

A linen fabric of low resistance to slipping is treated on a Foulard machine at ordinary temperature with a solution which is prepared by diluting stock solution No. 3 until it contains 10 grams of solid material per liter. It is then squeezed out and dried on cans. After this treatment the fabric is very resistant to slipping.

Example 2

An open weave rayon fabric is treated at 50° C. with a solution prepared from stock solution No. 2 by diluting until it contains 40 grams of solids per liter and adding thereto 2.5 grams per liter of 10% aqueous ammonia. After drying, the resistance to slipping of the fabric is considerably increased.

Example 3

A loosely woven rayon fabric is treated as in Example 2 with a solution prepared by diluting the stock solution No. 1 until it contains 5 grams of solid substance per liter and adding thereto 5 grams per liter of 10% aqueous ammonia.

We claim:

1. The process for increasing the slip resistance of fabrics which comprises treating said fabric with a solution containing oxalic acid and a phosphate of a trivalent metal.

2. The process for increasing the slip resistance of fabrics which comprises treating said fabric with a solution containing oxalic acid and a phosphate of a trivalent metal which is a member of the group consisting of iron, chromium and aluminum.

3. The process for increasing the slip resistance of fabrics which comprises treating said fabric with a solution containing ferric phosphate and oxalic acid at a pH of from about 3 to about 6.

4. The process for increasing the slip resistance of fabrics which comprises treating said fabric with a solution containing aluminum phosphate and oxalic acid at a pH of from about 3 to about 6.

5. The process for increasing the slip resistance of fabrics which comprises treating said fabric with a solution containing chromium phosphate and oxalic acid at a pH of from about 3 to about 6.

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