

Patented Oct. 30, 1934

1,978,785

UNITED STATES PATENT OFFICE

1,978,785

TREATMENT OF TEXTILE AND OTHER MATERIALS

Henry Dreyfus, London, and William Alexander Dickie and Percy Frederick Combe Sowter, Spondon, near Derby, England, assignors to Celanese Corporation of America, a corporation of Delaware

No Drawing. Original application August 15, 1930, Serial No. 475,630. Divided and this application April 4, 1932, Serial No. 603,220. In Great Britain August 27, 1929

8 Claims. (Cl. 91—68)

This invention relates to the sizing or like treatment of filaments, threads, yarns, fabrics and other textile materials.

In U. S. application S. No. 475,630 filed 15th August, 1930, of which this is a divisional application, there is described a process for sizing textile materials with carboxylic esters of cellulose containing ester radicles having as substituents groupings imparting solubility in aqueous liquids to the cellulose esters.

According to the present invention the sizing or like treatment of filaments, threads, yarns, fabrics or other textile or like materials is accomplished by a process comprising the application of water-soluble cellulose ethers containing ether radicles having substituent groups imparting water-solubility. As examples of such substituents particular mention may be made of carboxyl and hydroxyl groups. It has been found that textile materials sized in this manner, for example warp threads, resist very well such mechanical treatment as is experienced, for instance, in weaving, and that the size can readily be removed by a mild scouring process and does not interfere with the subsequent dyeing of the materials.

Cellulose ethers capable of solution in water may be obtained by direct etherification of cellulose under suitable conditions. For instance cellulose may be etherified so as to contain residues of glycols or other polyhydric alcohols, for example in the manner described in U. S. Patent No. 1,502,379 and U. S. application S. No. 162,214 filed January 19th, 1927, or cellulose may be etherified with carboxy-alkyl groups, for example alkali cellulose may be treated with chloroacetic acid so as to produce cellulose derivatives containing $1\frac{1}{2}$ to 2 or more carboxymethylether groups per $C_6H_{10}O_5$ molecule. It will be appreciated that the cellulose ether molecules should contain a sufficient proportion of hydroxyl or carboxyl groups or other suitable groups to impart water-solubility thereto.

Again if desired there may be employed cellulose ethers which owe water-solubility not only to the presence of suitable groups but also to the cellulose content being more or less degraded. Thus a cellulose ether containing free carboxyl or hydroxyl groups may be degraded or "ripened" to the desired degree of solubility, or a degraded cellulose, obtained for instance by degrading cellulose with alkalis or acids, may be etherified by means of radicles containing carboxylic or hydroxy groups.

In general it is found that the most satisfactory results are obtained by sizing with aqueous solutions of the cellulose ethers which yield films on evaporating the aqueous media.

Solutions of the cellulose ethers may be employed for the sizing of yarns, filaments, threads, fabrics or other textile materials in any convenient manner. For example, the yarns or the like may be treated in hank form with the solutions, or they may be passed continuously through the solutions and subsequently subjected to a drying operation. One application of the new process is to the sizing of artificial filaments, yarns or the like continuously with their production. For example a solution of cellulose acetate in acetone may be spun into an evaporative atmosphere and the sizing solution applied continuously to the filaments as they leave the spinning apparatus and prior to their being wound or twisted and wound (see U. S. Patent No. 1,506,052).

The new process of sizing may be applied to textile materials made of any desired filaments or fibres whether natural or artificial. The invention is however of particular value in the sizing of yarns or threads of artificial filaments for example filaments of regenerated cellulose, as produced for instance by the viscose or cuprammonium process, or filaments of organic derivatives of cellulose, e. g. cellulose acetate, formate or other ester of cellulose or methyl, ethyl or benzyl cellulose or other ether of cellulose.

As mentioned previously the sizes applied to textile materials in accordance with the invention, may, if desired, readily be removed on account of their solubility in water. For example removal may be effected by scouring, e. g. in an aqueous soap solution. In some cases, removal may be assisted by alkalis. Very small concentrations of alkali may have a beneficial action in the removal of the size, a great advantage in the treatment of materials made of or containing cellulose esters or other materials liable to damage by strongly alkaline solutions.

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

1. Process of sizing filaments, threads, yarns, fabrics and other textile materials containing an organic derivative of cellulose, which comprises applying thereto water-soluble ethers of cellulose containing ether radicles having as substituents at least one radicle selected from the group consisting of carboxyl and hydroxyl radicles.

2. Process of sizing filaments, threads, yarns, fabrics and other textile materials containing a carboxylic ester of cellulose, which comprises ap-

plying thereto water-soluble ethers of cellulose containing ether radicles having carboxyl groups as substituents.	
3. Process of sizing filaments, threads, yarns, fabrics and other textile materials containing cellulose acetate, which comprises applying thereto water-soluble cellulose ethers containing ether radicles having hydroxyl groups as substituents.	80
4. Process of sizing filaments, threads, yarns, fabrics and other textile materials containing cellulose acetate, which comprises applying thereto water-soluble ethers of cellulose containing ether radicles having carboxyl groups as substituents.	85
5. Process of sizing filaments, threads, yarns, fabrics and other textile materials containing cellulose acetate, which comprises applying thereto water-soluble ethers of cellulose containing carboxy methyl groups.	90
6. Filaments, threads, yarns, fabrics and other textile materials containing an organic derivative of cellulose, sized with water-soluble cellulose ethers containing ether radicles having as substituents at least one radicle selected from the group consisting of carboxyl and hydroxyl radicles.	95
7. Filaments, threads, yarns, fabrics and other textile materials containing cellulose acetate, sized with water-soluble cellulose ethers containing ether radicles having carboxyl groups as substituents.	
8. Filaments, threads, yarns, fabrics and other textile materials containing cellulose acetate, sized with water-soluble cellulose ethers containing carboxy methyl groups.	
HENRY DREYFUS.	
WILLIAM ALEXANDER DICKIE.	
PERCY FREDERICK COMBE SOWTER.	
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