

UNITED STATES PATENT OFFICE

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TEXTILE MATERIAL AND METHOD OF PREPARING THE SAME

No Drawing.

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This invention relates to textile materials, such as yarns or fabrics, made of or containing organic derivatives of cellulose and having therein or thereon a substance that causes the same to scorch at temperatures below their melting points.

An object of our invention is to incorporate in textile materials containing organic derivatives of cellulose, substances that lower the scorching temperature of the same. Other objects of our invention will appear from the following detailed description.

Unlike textile materials made of cotton, natural silk, wool or reconstituted cellulose, textile materials containing organic derivatives of cellulose tend to melt when they are subjected to an iron or calender that is at too high a temperature. While the safe ironing temperature of organic derivatives of cellulose material is no lower than the safe ironing temperature of natural silk, these organic derivatives of cellulose textile materials do not scorch at temperatures substantially below the temperature at which they tend to melt, and therefore the launderer does not have the warning of scorching to indicate too high temperatures of the iron or calender as he does in the case of the laundering of other textile materials.

We have found that if certain substances are incorporated in the textile material containing organic derivatives of cellulose, either prior or subsequent to its formation, the temperature at which it scorches is reduced considerably below the temperature at which it melts, and therefore if too hot an iron or calender is applied to such textile material, it tends to scorch and thus offer a warning to the operator that the iron is too hot, so that the melting of the textile material may be avoided.

In accordance with our invention, we prepare textile materials containing organic derivatives of cellulose which tend to scorch at temperatures lower than at which they melt, by incorporating therein or thereon, either prior or subsequent to their formation, substances which cause such textile materials to scorch before they tend to melt.

The textile material may contain any suit-

able organic derivative of cellulose such as organic esters of cellulose or cellulose ethers. Examples of organic esters of cellulose are cellulose acetate, cellulose formate, cellulose propionate and cellulose butyrate, while examples of cellulose ethers are ethyl cellulose, methyl cellulose and benzyl cellulose. Such textile material need not consist wholly of yarns of organic derivatives of cellulose, but may also contain fibres of other materials such as natural silk, cotton, wool or reconstituted cellulose. The textile material may be in the form of yarns, or it may be in the form of a knitted or woven fabric containing yarns of organic derivatives of cellulose.

As stated, the substance that tends to lower the scorching point may be added to the textile material either before or after its formation. Thus the substance may be added to the solution of the organic derivative of cellulose prior to its extrusion through orifices into a drying atmosphere or into a precipitating bath to form the filaments or yarn. On the other hand, the yarn, after its formation, may be subjected to a solution or paste containing the substance that tends to cause scorching. If desired, the fabric containing organic derivative of cellulose yarn may be treated with the substance that tends to cause scorching.

Any suitable organic substance that does not deleteriously affect the textile material containing the organic derivatives of cellulose, and which tends to lower the scorching point of such textile material, may be used. This substance may be an oil such as olive oil, an organic salt such as the acetates of sodium, potassium, or aluminum, soaps such as the oleate or stearate of sodium or potassium, starches, albumen, gelatin, latex, or a wax such as beeswax or spermaceti. Some of these substances, such as olive oil, are best incorporated in the spinning solution, while some of the others may well be applied to the yarn or fabric.

If such substances that tend to cause scorching are applied to the yarn or fabric, after the formation of the same, often swelling agents such as the thiocyanate of ammonium, sodium or potassium, or formic acid

may be added to the treating solution containing the same to cause better penetration thereof into the yarn or fabric. Moreover, if the substance is a water soluble salt, such as sodium acetate, it is well to apply a solution of the same in conjunction with a coagulating agent, such as egg albumen, to fix the same, so that upon subsequent washing of the textile material, the soluble salt is not removed to a substantial extent.

If the textile material contains organic esters of cellulose, further advantages may be obtained by saponifying the surfaces of the filaments or yarns of the organic esters of cellulose to increase the safe ironing temperature thereof. Thus the yarn or fabric may be subjected to a dilute alkaline bath until it suffers a loss in weight of from 3 to 10% or more by saponification. Other methods of obtaining surface saponification of the filaments or yarns may also be employed. This surface saponification of the textile material may be caused to take place either prior or subsequent to the incorporation of the substance that tends to lower the scorching temperature. While the surface saponification may be produced in any suitable manner, we prefer to employ the processes described in our copending applications Nos. 248,558 filed Jan. 21, 1928; 268,365 filed April 7, 1928 and 303,600 filed Sept. 1, 1928.

Textile materials when made or treated in accordance with our invention scorch at temperatures of 10 to 30° C. or more lower than the temperature at which they tend to melt. If an attempt is made to iron such textile materials with an iron or calender that is too hot, ample warning will be given by the tendency of the textile material to scorch first. In order further to illustrate our invention but without limiting the scope thereof, the following specific examples are given.

Example I

A fabric consisting wholly of cellulose acetate yarn is scoured and then subjected to a bath containing about 0.5 grams per litre of caustic soda in such a manner as described in our applications Nos. 248,558 and 268,365 that it suffers a loss of weight of about 6% by saponification. This treatment materially increases the temperature at which the fabric may be ironed safely. The so treated fabric is then subjected on a jig to an aqueous bath containing 15 grams per litre of sodium acetate and 10 grams per litre of egg albumen, the temperature of the bath being 60° and the time of treatment being about 10 minutes. The material is then dried on a tenter at a temperature of about 78° to 85° C. to cause the coagulation of the albumen.

The fabric so treated scorches at a temperature considerably below that at which it melts. Even after the fabric is washed for 10 minutes at 70° C. in a soap bath contain-

ing 5 grams of soap per litre, rinsed and dried, the materials tending to cause scorching are retained so that the washed fabric still has a reduced scorching temperature.

Example II

A fabric consisting wholly of cellulose acetate yarn and partially saponified as described in Example I is treated on a jig with an aqueous solution containing 15 grams of sodium acetate per litre for about 15 minutes. It is then dried on a tenter and is found to have a materially lower scorching temperature than the fabric that is not treated.

It is to be understood that the foregoing detailed description is given merely by way of illustration, and that many variations may be made therein without departing from the spirit of our invention.

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

1. The method of producing textile materials such as yarns and fabrics containing organic derivatives of cellulose and having a reduced scorching temperature, comprising incorporating a substantially neutral substance adapted to lower the temperature at which said textile materials tend to scorch and permitting said substance to remain in the textile materials.

2. The method of producing textile materials such as yarns and fabrics containing cellulose acetate and having a reduced scorching temperature, comprising incorporating a substantially neutral substance adapted to lower the temperature at which said textile materials tend to scorch and permitting said substance to remain in the textile materials.

3. The method of producing textile materials such as yarns and fabrics containing organic derivatives of cellulose and having a reduced scorching temperature, comprising incorporating a substantially neutral organic compound adapted to lower the temperature at which said textile materials tend to scorch and permitting the organic compound to remain in the textile materials.

4. The method of producing textile materials such as yarns and fabrics containing cellulose acetate and having a reduced scorching temperature, comprising incorporating a substantially neutral organic compound adapted to lower the temperature at which said textile materials tend to scorch and permitting the organic compound to remain in the textile materials.

5. The method of producing textile materials such as yarns and fabrics containing organic derivatives of cellulose and having a reduced scorching temperature, comprising incorporating a metallic acetate adapted to lower the temperature at which said textile materials tend to scorch.

6. The method of producing textile mate-

rials such as yarns and fabrics containing cellulose acetate and having a reduced scorching temperature, comprising incorporating a metallic acetate adapted to lower the temperature at which said textile materials tend to scorch.

7. The method of producing textile materials such as yarns and fabrics containing organic esters of cellulose and having a safe ironing temperature and a reduced scorching temperature, comprising the steps of partially saponifying the organic ester of cellulose material and incorporating a substance adapted to lower the temperature at which the textile material tends to scorch.

8. The method of producing textile materials such as yarns and fabrics containing cellulose acetate and having a safe ironing temperature and a reduced scorching temperature, comprising the steps of partially saponifying the cellulose acetate material and incorporating a substance adapted to lower the temperature at which the textile material tends to scorch.

9. The method of producing textile materials such as yarns and fabrics containing organic esters of cellulose and having a safe ironing temperature and a reduced scorching temperature, comprising the steps of partially saponifying the organic ester of cellulose material and incorporating a metallic acetate adapted to lower the temperature at which the textile material tends to scorch.

10. The method of producing textile materials such as yarn and fabrics containing cellulose acetate and having a safe ironing temperature and a reduced scorching temperature, comprising the steps of partially saponifying the cellulose acetate materials and incorporating a metallic acetate adapted to lower the temperature at which the textile material tends to scorch.

11. Textile materials such as yarns and fabrics containing organic derivatives of cellulose and also containing a substantially neutral substance that lowers the temperature at which the textile materials scorch.

12. Textile materials such as yarns and fabrics containing cellulose acetate and also containing a substantially neutral substance that lowers the temperature at which the textile materials scorch.

13. Textile materials such as yarns and fabrics containing organic derivatives of cellulose and also containing a metallic acetate that lowers the temperature at which the textile materials scorch.

14. Textile materials such as yarns and fabrics containing cellulose acetate and also containing a metallic acetate that lowers the temperature at which the textile materials scorch.

15. Textile materials such as yarns and fabrics having a safe ironing temperature and a reduced scorching temperature, said

textile materials containing an organic ester of cellulose which has been partially saponified and also containing a substance that lowers the temperature at which they scorch.

16. Textile materials such as yarns and fabrics having a safe ironing temperature and a reduced scorching temperature, said textile materials containing cellulose acetate which has been partially saponified and also containing a substance that lowers the temperature at which they scorch.

In testimony whereof, we have hereunto subscribed our names.

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