Patented Feb. 14, 1933 1,897,712

UNITED STATES PATENT OFFICE

HERBERT PLATT AND CYRIL MANSLEY CROFT, OF CUMBERLAND, MARYLAND, ASSIGNORS TO CELANESE CORPORATION OF AMERICA, A CORPORATION OF DELAWARE

FABRIC AND METHOD OF PRODUCING THE SAME

No Drawing. Application filed October 21, 1927. Serial No. 227,856.

This invention relates to the treatment of fabrics composed in part or in whole of thermoplastic or organic derivatives of cellulose.

In the ironing of fabrics composed at least in part of organic derivatives of cellulose, for instance, cellulose acetate silk, care must be taken to avoid too high temperatures, since if the iron or calender is above 220° C. sticking of the fabric to the iron or calender and melting of the cellulose derivative will result. While this property of such fabrics causes no more difficulty than is encountered in the ironing of natural silk, it is desirable to raise the permissible temperature of ironing as much as possible. Moreover, when fabrics constituted as above, and particularly delustered fabrics of this nature, are ironed while they are damp with ironing means that are above 100° C., the lustre of the fabric is increased. As this increase of lustre is not uniform, an irregular sheen or even spots are produced.

An object of this invention is to treat fabric composed in whole or in part of thermoplastic or organic derivatives of cellulose so as to decrease its tendency to stick to a hot iron or calender, whereby the temperature of the ironing means may be raised without danger of damage.

Another object of this invention is to treat fabric constituted as above set forth, so that it may be ironed while damp with an iron at a temperature above 100° C. without causing any increase of lustre or spots.

Another object of this invention is to treat fabric composed in whole or in part of thermoplastic or organic derivatives of cellulose with a bath containing a metallic salt such as basic aluminum acetate whereby its resistance against sticking to a hot iron is enhanced.

Other objects of this invention will appear from the following detailed description.

In carrying out our invention, the fabric composed in whole or in part of thermoplastic derivatives of cellulose or organic derivatives of cellulose is treated. The organic derivatives of cellulose may be organic esters of cellulose or organic ethers of cellulose. Examples of organic esters of cellulose are cellulose formate, cellulose acetate, cellulose propionate, and cellulose butyrate. Examples of organic ethers of cellulose are methyl cellulose, ethyl cellulose and benzyl cellulose. The fabric may be composed entirely of one of the above mentioned materials or it may be composed entirely of a mixture of two or more of the above named materials. Furthermore, the fabric may be a "mixed" fabric composed of a mixture of yarns made from any of the thermoplastic or organic derivatives of cellulose and of yarns made of other fibres. Examples of such "mixed" fabrics are mixed cellulose acetate and natural silk, mixed cellulose acetate and wool, mixed cellulose acetate and cotton, etc. In the interest of brevity, a detailed description will be given with respect to a fabric composed entirely of cellulose acetate. However, it is to be understood that this invention is not limited to pure cellulose acetate fabrics, but may be applied to any of the fabrics above mentioned.

According to our invention, the cellulose acetate fabric is treated with a solution of a salt that is adapted to decrease its tendency towards sticking to a hot iron. We have found that an aqueous solution of basic aluminum acetate and acetic acid serves the purpose best. However, solutions of other metallic salts and particularly other aluminum salts may be used. Moreover, acids other than acetic acid, and particularly other organic acids such as formic acid, may be used.

In one mode of carrying out our invention, the cellulose acetate fabric is immersed in an aqueous bath containing from 10

grams to 50 grams of basic aluminum acetate, $Al(CH_3COO)_2OH$, per litre of solution and also containing from 50 cc. to 100 cc. of acetic acid per litre of solution. The temperature of the bath may be anywhere between ordinary room temperature (15° C.) to 60° C., although I have found that a bath temperature of 40° is the best. The time of treatment also may be varied within large limits, but we have found that no substantial advantages accrue by prolonging the immersion over a period longer than 45 minutes. As far as we are aware, the best results are obtained by immersing the cellulose acetate fabric in an aqueous solution containing 10 grams of basic aluminum acetate per litre and 100 cc. acetic acid per litre maintained at a temperature of 40° C., for a period of 45 minutes. The fabric is then rinsed and dried, and is now ready for any finishing operation that is desired or necessary.

However, it is to be understood that the conditions of treatment may be varied within wide limits. We have used as a treating bath for the fabric, solutions containing 100 cc. of acetic acid per litre and containing 10 grams, 20 grams, 30 grams, 40 grams and 50 grams of basic aluminum acetate per litre. We have also used as a treating bath a solution containing 30 grams of basic alumiuum acetate and containing 50 cc., 100 cc., 150 cc., 200 cc. and 250 cc. of acetic acid per litre of solution. We have also used a solution containing 36 grams of basic aluminum acetate per litre and 50 grams of ammonium sulphocyanide per litre.

This treatment of cellulose acetate fabric results in a remarkable enhancement of its properties. Thus, cellulose acetate fabric before treatment by our process will melt and stick to an iron when such iron is at a temperature above 220° C., say 225° C. After it has been subjected to the treatment described above, it may be iron with an iron or calender maintained at a temperature of 230° C. or 240° C. or as high as 250° C. without sticking to the ironing means. The fabric after this treatment may be ironed while in a damp condition with a hot iron maintained above 100° C. but below the sticking point, without any increase of lustre, whereas the lustre of untreated fabric will be increased when ironed in this manner. Furthermore, the treatment with the bath of basic aluminum acetate, as set forth above, acts as a water-proofing agent and imparts water-proof properties to the fabric. Part of the basic aluminum acetate of the bath is incorporated in the fabric either as basic aluminum acetate or as aluminum oxide as is indicated by the fact that the fabric treated in accordance with our invention has an ash content of anywhere from 0.12% to 1.23% and sometimes more. By variations in the proportions of the ingredients, we have obtained fabrics that do not stick to an iron heated to 230° C., 240° C., 250° C. or over.

The fabric treated in accordance with our invention has a pearly luster. Furthermore, such fabric is waterproof, as is indicated by the fact that when water was poured into a recess made of this fabric and was permitted to remain overnight, no water had percolated through by the following morning.

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

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

1. Method of treating fabric containing thermoplastic cellulose compounds, comprising treating the same with a solution containing a salt adapted to raise the "sticking" point of such fabric when subjected to a hot iron.

2. Method of treating fabric containing organic derivatives of cellulose, comprising treating the same with a solution containing a salt adapted to raise the "sticking" point of such fabric when subjected to a hot iron.

3. Method of treating fabric containing cellulose acetate, comprising treating the same with a solution containing a salt adapted to raise the "sticking" point of such fabric when subjected to a hot iron.

4. Method of increasing the "sticking" point of fabric containing organic derivatives of cellulose comprising treating the same with a solution containing an aluminum salt.

5. Method of increasing the "sticking" point of fabric containing cellulose acetate, comprising treating the same with a solution containing aluminum acetate.

6. Method of increasing the "sticking" point of fabric containing cellulose acetate comprising treating the same with a solution containing aluminum acetate and an acid.

7. Method of increasing the "sticking" point of fabric containing cellulose acetate comprising treating the same with a solution containing aluminum acetate and acetic acid.

8. Method of increasing the "sticking" point of fabric containing cellulose acetate comprising treating the same with a solution containing about 10 grams to about 50 grams of basic aluminum acetate per litre and acetic acid.

9. Method of increasing the "sticking" point of fabric containing cellulose acetate comprising treating the same with a solution containing about 10 grams to about 50 grams of basic aluminum acetate per litre and

about 50 cc. to 100 cc. of acetic acid per litre.

10. Method of increasing the "sticking" point of fabric containing cellulose acetate comprising treating the same with a solution containing about 10 grams to about 50 grams of basic aluminum acetate per litre and about 50 cc. to 100 cc. of acetic acid per litre for a period of about 45 minutes, said solution having a temperature of about 40° C.

In testimony whereof, we have hereunto subscribed our names.

HERBERT PLATT.
CYRIL MANSLEY CROFT.