Patented May 5, 1931 1,803,672

UNITED STATES PATENT OFFICE

GUILLAUME LARDY, OF PEAGE-DE-ROUSSILLON, FRANCE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO DU PONT RAYON COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

PROCESS OF RESTORING THE LUSTER TO RAYON

No Drawing. Application filed July 7, 1928, Serial No. 291,140, and in Great Britain November 4, 1927.

This invention relates to processes for the treatment of cellulose acetate threads and fabrics, and has for its object an improved treatment for these articles.

It is known that cellulose acetate threads lose their luster, accidentally or intentionally, and become tarnished, under the action of certain agents, in a more or less pronounced manner. The present invention consists in a particularly simple and economical process for imparting a renewed luster to cellulose acetate threads entering into the composition of fabrics which have partially or totally lost their luster.

A fabric entirely or partially constituted of cellulose acetate threads and which has lost its luster may be hot-calendered or passed between heated cylinders without losing its matt appearance when this mechanical treatment is applied in the dry state. It has, however, been found that if, instead of carrying out this hot mechanical treatment on the dry fabric, it is performed on the moist fabric, the cellulose acetate threads lose their matt appearance and recover their initial luster, this result being obtained when the iron or the calendering rolls or cylinders are at a temperature higher than 125° C.

According to this invention, therefore, the tarnished fabric to be treated is brought, while in the wet state and for a very short time, in contact with a hot surface, the temperature of which is above 125° C.

The rapidity with which this operation of restoring the luster takes place varies according to the temperature at which this operation takes place, this temperature being always above 125° C., and to the degree of moisture of the fabrics.

When the temperature is below 125° C., the luster is not restored or, at any rate, the effect is so small and takes so much time before becoming apparent that the process, under these conditions, would not be of any useful application in practice.

Above 160–170° C., the duration of the treatment must not exceed 1 to 2 seconds, since it is accompanied with a certain risk. Above this temperature range, if the finishing or printing machine stops, the fabric may be damaged, the damage consisting in a fusion of the threads which become welded to each other, so that the fabric becomes stiff and somewhat glazed. When the process according to the invention is applied within the limits of temperature mentioned above; that is, between 125° and 160–170° C., the fabric retains its initial suppleness absolutely unimpaired.

In order to ensure the restoration of the luster of cellulose acetate threads without any modification of their dynamometrical properties, the contact of the fabric with the hot surface must be secured without the application of a high mechanical pressure.

This arises from the fact that the fibres which are in a wet and, owing to this, less resisting state, are subjected, while raised to the elevated temperature required in order to restore their luster according to the present invention, to a too high mechanical pressure, such as, for instance, 5 or 10 kilogrammes per square centimetre, and lose part of their qualities. It is only necessary to ensure a proper contact between the hot surface and the fibres to which the luster is to be restored, and it has been observed that a pressure of 0.3 to 0.5 kilogrammes per square centimetre is sufficient to obtain a restoration of the luster under the temperature conditions mentioned for the application of the process.

The wetting of the fabric may be done with water. In order to do this, the fabric is immersed in water until it is perfectly and completely impregnated. During the operation of renovating the luster, in order to avoid the premature drying caused by evaporation, the fabric may be even moistened by sprinkling, or any other suitable

means, such as passing it between two wetting rollers.

For certain very thick fabrics, known wetting agents may be used (aqueous solutions or emulsions): "Monopol" soap, sulforicinate, soluble oils, oil or fat emulsions, or also aqueous solutions of calcium, magnesium or lithium chloride of 10 to 30% concentrations.

It will be readily understood that the invention can be applied in a great many different ways: it may be used to unite pieces spoiled by tarnishing or damaged by some treatment wherein the luster on various portions is less intense than the rest of the piece. It permits also the obtaining of brilliant patterns or ornaments of all kinds on tissues which have been rendered matt by a suitable treatment.

In producing ornamental or decorative effects on fabrics formed wholly or partly of dulled or matt appearing cellulose acetate threads, predetermined areas of the fabric may be moistened, after which the entire fabric may be subjected to a heated calendering operation. The portions of the fabric which have been moistened assume a brilliant luster or sheen. Instead of moistening predetermined areas of the fabric, the entire fabric may be moistened and then calendered with a heated calendering roll having certain parts thereof in intaglio. The relustering is obtained on those portions where the calendering roll contacts with the fabric.

It is evident that this operation of restoring the luster of tarnished threads is absolutely different from the glazing and water-proofing of the surface of the threads by the action of the heat and of the pressure on dry fabrics, or fabrics treated with plasticizing or swelling agents, or with cellulose acetate solvents, so as to obtain a more or less pronounced fusion effect.

According to the present invention, the tissue is treated after it has been wetted and the temperature and the duration of the contact with the hot surface are regulated so as to absolutely avoid any fusion effect of the filaments. The fibre in this way is brought back to a condition approaching very closely that of the untarnished thread and a fabric containing threads to which the luster has been restored in this manner can be washed, soaped, dyed and finished with the ordinary precautions without losing its luster. It is observed also that ,while the cross-sections of tarnished filaments are opaque, those of filaments to which the luster has been restored by the process according to the present invention are translucent, like those of a thread which has not been tarnished.

The invention will now be illustrated by the following examples, to which it is by no means limited:

Example 1.—A piece of satin, tarnished acetate silk warp, cotton weft, is wetted with water and put afterwards in contact, under a pressure of 0.1 to 0.3 kg./cm², with a metallic plate heated to 130° C. After 3 seconds, the treated portion of the fabric has recovered its luster.

Example 2.—A satin, cellulose acetate warp and weft has been accidentally spoilt during treatment. The damage consists in patches of a less accentuated luster than that of the rest of the fabric. This fabric is dipped in a solution of "Monopol" soap of ½ to 1% concentration until it is completely and uniformly impregnated. This result is obtained either by leaving the fabric immersed in the bath or by foularding. The tissue is then passed, whilst damp, in a calendering machine heated to 140–145° C., so that each portion of the fabric remains one second in contact with the heated portion. The calendering machine is adjusted for a pressure of 0.5 kg./cm² only. After the operation the tissue has recovered its original luster.

Since it is obvious that modifications may be made without departing from the nature of the invention, I do not intend to limit myself to the exact details above described except as set forth in the claims.

I claim:

1. A method of restoring the luster of dulled rayon produced from cellulose acetate which comprises wetting said rayon with an aqueous emulsion or solution of a soluble oil and hot-calendering said wetted rayon at a temperature not below 125° C. and a pressure not exceeding .5 kg./cm².

2. A method of restoring the luster of dulled rayon produced from cellulose actate which comprises wetting said rayon with an aqueous solution of soluble sulphonated oil and hot-calendering said wetted rayon at 140° C. to 145° C. and a pressure of .5 kg./cm².

3. A process which comprises wetting predetermined or local areas of fabrics containing dulled cellulose acetate threads and hot-calendering said fabrics at a temperature between 125° C. and 170° C. and a pressure of .1 kg./cm² to .5 kg./cm² whereby patterns having a luster are formed on a dull background.

4. A process which comprises wetting with water predetermined or local areas of fabrics containing dulled cellulose acetate threads and hot-calendering said fabrics at a temperature between 125° C. and 170° C. and a pressure of .1 kg./cm² to .5 kg./cm², whereby patterns having a luster are formed on a dull background.

5. A process which comprises wetting with water predetermined or local areas of fabrics containing dulled cellulose acetate threads and hot-calendering said fabrics at 130° C.

and a pressure of .1 kg./cm² to .3 kg./cm² for approximately three seconds, whereby patterns having a luster are formed on a dull background.

6. A process which comprises wetting and hot-calendering predetermined areas of a fabric containing dulled cellulose acetate threads at a temperature between 125° C. and 170° C. and a pressure of .1 kg./cm² to .5 kg./cm² whereby patterns having a luster are formed on a dull background.

In testimony whereof, I have affixed my signature to this specification.

GUILLAUME LARDY.