

UNITED STATES PATENT OFFICE

2,121,006

METHOD OF RENDERING TEXTILES RESISTIVE AGAINST SHRINKING AND PRODUCT THEREOF

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No Drawing. Application October 4, 1934, Serial No. 746,933. In Switzerland November 25, 1933

2 Claims. (Cl. 91—70)

This invention relates to the production of textile articles resistive against shrinking.

It is a known fact that fabrics made of wool, cotton, artificial silk and combinations of these textiles as well as fabrics made of mixed fibers shrink when washed, that is decrease in length or in width or in both directions.

A method of counteracting this deficiency heretofore practiced consists in washing such fabrics prior to making the articles therefrom for which they are intended. This method is applicable to advantage particularly to fabrics which have either a natural, that is, an unsized texture or else a permanent texture by which is meant that the fabric is provided with a sizing which is absolutely fast to washing. Fabrics the sizing of which is of a lesser fastness to washing have been attempted to be remedied in this respect by causing the fabric to shrink from the start by means of complicated mechanical devices which operate to tension the fabric and simultaneously alternately wetting the same, by steaming it, and drying the tensioned fabric again (sanforizing). By treating the fabric in this way its quality is, however, impaired, as the aspect of the surface of the fabric is detrimentally affected by the original feel and gloss of the fabric being either entirely eliminated or at least considerably lessened.

Furthermore the two known methods referred to immediately above both have an important disadvantage, namely, that due to the considerable shrinkage the fabrics undergo, the original superficial area of the fabric is greatly reduced and thus a corresponding financial loss is incurred.

I have now found as a surprising result that the shrinkage of the fabrics can be considerably diminished by impregnating the fabric with certain substances. As proper substances for this purpose artificial resins or components thereof qualify, for example, phenol resins, aldehyde resins, carbamide resins, in all water soluble stages of condensation thereof; furthermore soluble mixtures of components of the artificial resins mentioned, for example urea or thio-urea or mixtures thereof with formaldehyde. In using the specified artificial resins the advantage of being able to subsequently easily convert the same into the water insoluble state ensues.

The fabric thus treated with the water soluble resins is distinguished by a sizing of resinous substances which is fixed in tensioned condition of the fabric by a hot treatment thereof.

In certain cases it may be advantageous to

combine the impregnation with the sizing process, for example by impregnating the fabric in a manner known per se, say with starch, and thereupon treating it with the resin in dissolved state.

The method according to the invention is advantageously carried into effect in the following manner.

A fabric, for example a cotton voile, is impregnated with a solution, preferably in water, of one of the artificial resins mentioned above, for instance carbamide resin. Thereupon the fabric is dried and hardened in stretched condition, advantageously, so that the marketable overall dimensions of the fabric result. After the final washing the wet fabric is subjected in stretched condition to a final drying process in which the fabric is caused to assume the same dimensions as obtained during the hardening process. The fabric thus treated is surprisingly less prone to shrink in the wash while in use, as compared to fabrics which are not treated in this way.

It is obvious that the novel method is particularly well suited to be applied to fabrics which shrink considerably in the wash. As fabrics having this tendency, above all, voile, tulle or marquisettelike fabrics must be mentioned, as well as certain fabrics for shirts, mousseline, and the like, in short all fabrics and meshed goods of a loose texture.

As impregnating material particularly condensation products of carbamide have stood the practical tests and among these especially those which are distinguished by a good solubility in water together with mixtures of components thereof. These substances may be applied singly or in connection with known sizing, hardening, wetting or softening means or dyestuffs, as for instance blueing and so forth.

In order to enable the use of low temperatures in the hardening process it is advantageous to work in the presence of catalyzers. The type of catalyzer to be used, which as a rule is of slightly basic or acid nature, depends on the starting materials applied for the artificial resin chosen.

Example 1

A bleached mercerized cotton fabric is wetted and then passed several times through a 20% aqueous solution of a catalyzer containing urea-thio-urea-formaldehyde condensation product and each time squeezed out until 200% of the dry weight of the fabric is reached. The thus prepared wet fabric is then dried in a tenter and caused to assume the marketable length and

width and thereupon subjected to a temperature of at least 120 to 140° C. Afterwards the fabric is washed, rinsed and dried in the tenter so as to reassume the same dimensions as previously obtained. The thus treated fabric shrinks in the wash during the ironing only slightly. While the original voile contracts in the wash from a width of 110 centimeters to 100 to 102, the same voile treated according to the invention contracts only down to 108 to 109 centimeters, which represents an extraordinary advance in the art. In both cases the width of the fabric was measured at the same constant length thereof.

The method according to the invention is applicable with equal advantage to raw, bleached, mercerized fabrics or fabrics which had been treated with another swelling agent, for example an acid. As a special advantage of the fabric according to the invention the fact deserves mentioning that the surface of this fabric retains its aspect which it had before the treatment, particularly in respect of gloss and other qualities as for example the feel.

Example 2

A raw fabric which had only been washed, or else a definitely bleached and mercerized fabric is impregnated with a solution which contains in 1 litre of water 20 to 100 grams of starch and 10 to 50 grams of a soluble urea and a thio-urea-formaldehyde condensation product, and then further treated under the same conditions as described in Example 1. The fabric thus sized shrinks in the wash during the ironing scarcely 0.5 to 1% in length and width.

In my copending application, Serial No. 746,932, filed October 4, 1934, I have described and claimed a method of producing textile fabrics having permanent formed patterns, in which the textile is impregnated with certain resins adapted to be hardened by heat, then is calendered to produce the desired surface finish and then subjected to heat treatment to complete the hardening of the resin so that the pattern is rendered permanent against washing.

What I claim is:

1. Process for the treatment of a cellulose textile fabric to produce predetermined finished dimensions for the fabric and to render it substantially unshrinkable from said dimensions by repeated washings and without substantially impairing the surface of the fabric in respect to the original gloss and feel, comprising impregnating the fabric with an aqueous solution containing the components of a resin capable of being hardened by heat treatment, thereupon drying the thus prepared wet fabric in a tenter to cause it to assume a marketable length and width and then subjecting the fabric while maintaining the said dimensions to a heat treatment to harden the resin thus fixing the said dimensions of the fabric against shrinkage from repeated washings.

2. The product of the process of claim 1 being a cellulose fabric impregnated with a heat hardened resin and characterized by the property of substantial unshrinkableness to repeated washings and without any substantial impairment of the surface of the fabric with respect to gloss and feel.

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