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PROCESS FOR THE SIMULTANEOUS DESIZING, SCOURING AND BLEACHING OF FABRICS

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No Drawing. Continuation-in-part of application Ser. No. 496,586, Oct. 15, 1965, now Patent No. 3,377,131. This application Feb. 12, 1968, Ser. No. 704,542
Claims priority, application Italy, Feb. 27, 1967, 13,085/67
Int. Cl. D06l 3/02
U.S. Cl. 8—111 1 Claim

ABSTRACT OF THE DISCLOSURE

In a method for simultaneously desizing, scouring and bleaching fabrics containing cotton fibers of the kind wherein the fabric is first impregnated at room temperature with an aqueous hydrogen peroxide containing solution and is subsequently treated with saturated steam, with hot water and with a mixture of hot water and steam, the invention proposes that the aqueous solution contain 2.5 to 8.5% by weight of hydrogen peroxide, as 35% aqueous solution, and 0.2 to 5% by weight of caustic soda of 36° Bé.

CROSS REFERENCE TO PRIOR APPLICATIONS

This a continuation-in-part of my application Ser. No. 496,586, filed Oct. 15, 1965, now Pat. No. 3,377,131.

The present invention refers to a process for simultaneously desizing, scouring and bleaching of fabrics which contain cotton balls and unripened cotton, although it is adapted to be used with all the other kinds of fabrics.

It has been found that the process disclosed and claimed in the above mentioned patent application is perfectly adapted to carry out a simultaneous desizing, scouring and bleaching of botton fabrics and also of fabrics obtained with and admixture of cotton fibres and synthetic fabrics which do not contain, or contain only to a negligible extent cotton bolls, does not give satisfactory results for the treatment of fabrics which contain cotton bolls and unripened cotton.

According to the present invention, it has been ascertained that, whenever to the treatment bath suggested in the above patent application (said bath essentially comprising an aqueous solution of hydrogen peroxide having an H_2O_2 contents ranging from 25 to 85 grams per liter), an amount of 35° Beaumé-caustic soda ranging from 0.2% to 5% is added, also the fabrics which contain cotton balls and unripened cotton are simultaneously desized, scoured and bleached in a satisfactory way and within a very short time.

It should be observed that the method according to the present invention is characterized in that a fabric, kept in full width, is first impregnated, substantially at room temperature, with an aqueous solution containing hydrogen peroxide in an amount corresponding to a contents between 2.5% and 8.5% by weight of 35% aqueous hydrogen peroxide and caustic soda in an amount corresponding to a contents of from 0.2% to 5% by weight of 35° Beaumé-caustic soda, the fabric being then steamed with saturated steam at a temperature between 90° C. and 100° C., then treated with hot water at a temperature comprised between 60° C. and 90° C. then with hot water and steam between 90° C. and 100° C., and finally washed first with hot water and subsequently with cold water.

The fabric thus obtained can then undergo conventional treatments such as optical bleaching steps.

In order to give a clearer understanding of the inventive method, a few practical examples, thereof will be given in the following.

Before delving into a detailed description of the examples, it is fitting to emphasize that, while for putting the method into practice what is essential is that the aqueous solution which forms the impregnation bath contain hydrogen peroxide and caustic soda in the proportions as given above, it is preferred that said solution is suplemented by a stabilizer, a sequestering agent and a capillary-active agent, whose employment improves and considerably accelerates the obtention of a very satisfactory end result of the method.

The stabilizers have the function of hindering the evolution of oxygen from the highly concentrated hydrogen peroxide: said stabilizers are chemical compounds well known in the appertaining art, such as albuminous derivatives, sodium silicates, a product known in the trade under the registered trademark "RCSN Stabilizer" of Sandoz, Basel, Switzerland.

The sequestering agents are chemical compounds, well known in the appertaining art, which are adapted to induce, in a bath, the precipitation of certain salts, more particularly and by way of example, iron salts. Kinds of sequestering agents known in the trade are the one marketed under the trademark ROCE CH_3 by Chemitalia of Milan, Italy or under the trademark "Perma Kleer" of Refined Co., of U.S.A.

The capillary active agents are known compounds adapted to encourage the impregnation of a fabric by an aqueous bath: known capillary active agents are, for example, alkylphenol compounds, hydroxyethylene derivatives, the sodium salts of synthetic acrylic carboxylic acids, a product known in the market under the Trademark "Perentol RCS" of Sandoz, Basel, Switzerland.

EXAMPLE 1

A cotton popeline fabric, 100% cotton, having a weight of 130 grs. per meter and a width of 100 cms. is immersed in an impregnation bath, at room temperature, said bath being composed by an aqueous solution containing 6% of 35% by weight hydrogen peroxide, 0.8% of RCSN Stabilizer, 2% of 36° Beaumé caustic soda, 0.6% of a separating agent ROCHE CH3 and 0.5% of Perentol RCS, all the above given percentages being on a weight basis with respect to the total weight of the aqueous solution. The pH of said solution has a value between 9 and 11.

The fabric is left immersed in the bath during 7 seconds and is then squeezed until it contains between 85% and 95% of the solution, it being passed between squeezing rollers at a speed of 80 meters a minute. The fabric is then caused to stay in contact with saturated steam at a temperature comprised between 95° C. and 100° C. for 15 minutes. The fabric is then subjected to a first washing for 5 seconds with hot water at 80–90° C. and is caused to advance through the water of the first washing step at a speed of 80 meters a minute, and is then treated with hot water and steam at a temperature of 90° C.–100° C. for 23 seconds. Subsequently, and in a continuous manner, the fabric is subjected to a second wash for 5 seconds with water at a temperature of 70° C.–80° C. and to a third wash, for 5 seconds, with water at 50° C.–75° C., to a fourth wash for 5 seconds with water at 30° C.–40° C. and finally to a washing with cold water, also for 5 seconds, whereafter the fabric is squeezed in a jig.

Upon completion of the process described above, which lasts about 16 minutes, a fabric is obtained which is desized, scoured and bleached and has a very satisfactory water absorbency and whiteness.

In the example given above, as well as in the subsequent ones, it has been assumed that the method is carried out as a continuous run on a piece of fabric having an indefinite length and caused to advance at a constant speed through a plurality of subsequent adjacent vessels, in each of which a step of the method is to take place. The fabric,

issuing from a vessel, directly enters the next vessel and so forth. The longer or shorter duration of the fabric treatment in an individual step of the method is obtained by merely increasing or decreasing the size of each vessel, so that each individual portion of the fabric piece takes a longer or shorter time, respectively, to pass through the vessel involved.

EXAMPLE 2

A 65% polyester-35% cotton fabric, having a weight of 100 grs. per meter and having a raw width of 95 cms. is impregnated at room temperature with an aqueous solution having a pH of 11 and containing 3% of 35% by weight hydrogen peroxide, 1% of NaOH, 0.3% of a sequestering agent ROCE CH3, 0.4% of RCSN Stabilizer, 0.4% of Perentol RCS, said percentages being referred on a weight basis for the weight of the solution. The fabric is caused to stay in the impregnation bath during 7 seconds and is then caused to advance at a speed of 80 meters a minute between squeezing rollers until it contains 90% by weight of the solution. The fabric is then contacted with saturated steam for 10 minutes at a temperature comprised between 95° C. and 100° C. and is then subjected to a first wash, during 5 seconds, with water at 70° C.–80° C., to a treatment with hot water and steam at a temperature of 95° C.–100° C. for 23 seconds, to a second wash during 5 seconds with water at 70° C.–80° C., to a third wash for 5 seconds with water at 30° C.–40° C. and lastly to a wash with water at room temperature, during 5 seconds, the fabric being caused continually to advance through the several steps of the process at a speed of 80 meters per minute.

The total duration of the treatment is 11 minutes. The fabric thus obtained is desized, scoured and bleached and is perfectly water-absorbent and white without any appreciable loss of mechanical resistance (resistance loss: under 3%).

EXAMPLE 3

A pile fabric of the "cord" type, made of 100% cotton, having a weight of 375 grs. per meter and a width of 80 cms., is immersed during 14 seconds in an aqueous solution containing 4% of 35% by wt. hydrogen perxodie, 1.3% of caustic soda, 0.5 of a sequestering agent "ROCE CH3," 0.5% of RCSN Stabilizer, 0.6% of Perentol RCS, said percentages being referred, on a weight basis, to the weight of the solution, and is then passed, at a speed of 40 meters a minute between two squeezing rollers until it contains about 95% by weight of the solution. The fabric is now left in contact with saturated steam at a temperature of 95°–100° C. and is subsequently and continuously subjected to a first wash with hot water at 70° C.–80° C. for 14 seconds, to a treatment with hot water and steam at 95° C.–100° C. for 46 seconds, to a second wash with water at 50° C.–60° C. for 14 seconds, to a fourth wash with water at 30°–40° C. for 14 seconds, to a fourth wash with water at 30° C.–40° C. for 14 seconds and finally to a wash with water at room temperature, also for 14 seconds. The total duration of the desizing, scouring and bleaching treatment is about 17 minutes. The fabric thus obtained is perfectly water-absorbent and white.

It is apparent that the specific temperatures and durations of the treatment of the fabric in each step of the method can be readily varied within wide limits, the same final result being nevertheless obtained. For example, it has been ascertained that a wash carried out with hot water at 85° C. during 3 seconds produces the same effect of a washing effected with hot water at 65° during 12 seconds. It is thus obvious that the data set forth in the examples should not be construed as limitations, since they are given by way of illustration only. It should be observed that it is preferred that the fabric be squeezed between a step of the method and its next.

What is claimed is:

1. In a method for simultaneously desizing, scouring and bleaching fabrics containing cotton fibers, wherein the fabric is first impregnated, substantially at room temperature, with an aqueous hydrogen peroxide containing solution and subsequently sequentially treated with saturated steam at 90–100° C., with hot water of 60–90° C., and with a mixture of hot water and steam having a temperature between 90° and 100° C., and finally washed with hot and then with cold water, the improvement which comprises that the aqueous solution contains 2.5 to 8.5% by weight of hydrogen peroxide, as 35 weight percent aqueous solution, and 0.2 to 5% by weight of caustic soda of 36° Bé.

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MAYER WEINBLATT, Primary Examiner

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,595,603 Dated July 27, 1971

Inventor(s) GUISEPPE CERANA

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the heading of the patent, the date of the Italian application should read

--February 25, 1967--

Signed and sealed this 11th day of January 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Acting Commissioner of Patents

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