Dec. 30, 1930. A. W. BUHLMANN 1,786,421

METHOD OF TREATING TEXTILES OF CELLULOSE FIBER

Filed April 11, 1929

Fig 1

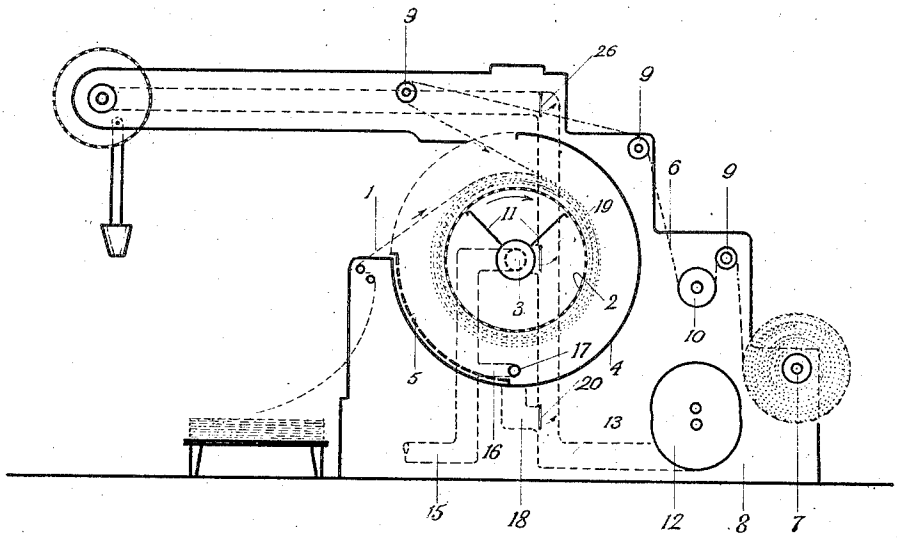


Fig 2

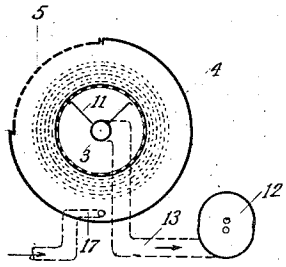


Fig 3

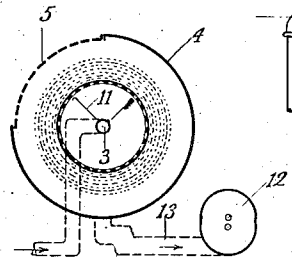


Fig 4

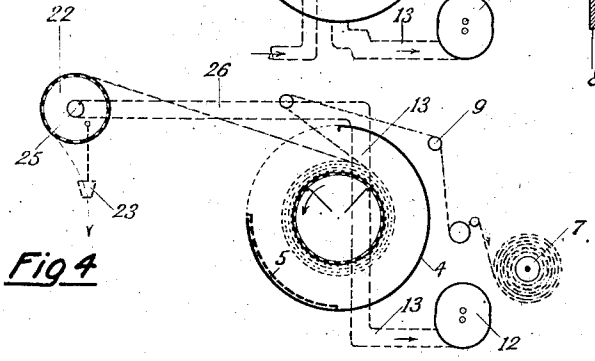
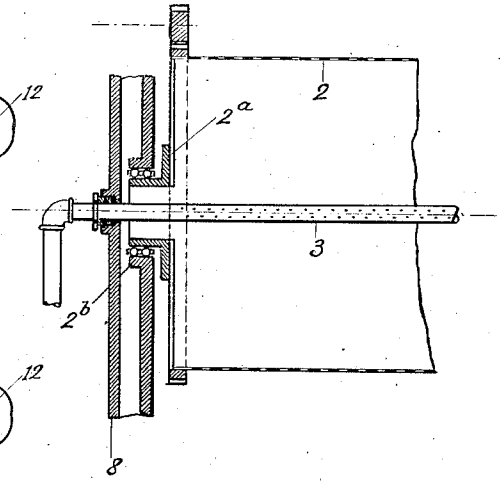


Fig 5



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METHOD OF TREATING TEXTILES OF CELLULOSE FIBER

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This invention is an improvement in methods of treating textiles of cellulose fiber, and the like.

In textiles of synthetic fiber, the fabric has a flat high lustre and speckled face, hiding the weave characteristic of artificial silks or fabrics of synthetic fiber. The material also frequently has a grayish tint, and some fabrics, particularly crepes, have a harsh rough feel.

One of the primary objects of the present invention is the provision of methods of so treating the silk fabric as to eliminate these undesirable characteristics of the goods.

Another object is the provision of a method of accentuating the weave, for deepening and enriching the color, and for imparting to the fabric a soft and mellow feel.

Another object is to produce a fabric composed of synthetic fiber, which more nearly resembles the natural silk and fibers heretofore produced.

In the drawings forming a part hereof:—

Fig. 1 is a diagrammatic side view showing one way in which the method may be carried out.

Figs. 2, 3 and 4 are similar views, showing alternate ways of carrying out the method.

Fig. 5 is a vertical section at the axis of the cylinder.

The improved process consists essentially in thoroughly and uniformly permeating the fabric with low pressure saturated steam, at a temperature of about 213.067° F., and at about 15 lbs. pressure. Preferably the fabric is blanketed during the treatment, and the blanket is treated with the fabric to insure thorough and uniform penetration.

Any one of several procedures may be followed in carrying out the method. As for instance, in Fig. 1, the fabric indicated at 1, is wound upon a hollow perforate cylinder 2, having bearing hubs 2*a* engaging within bearing openings 2*b* in the frame of the machine, and a hollow perforate pipe 3 is arranged at the axis of the cylinder, the pipe extending through one of the bearing hubs 2*a*, to near the opposite end of the cylinder.

The cylinder is enclosed in a housing 4, having a movable cover 5, which may be used to cover an opening of approximately 90° of the periphery of the housing. The blanket 6 passes from a supply roll 7 journaled in the frame 8 of the machine, over suitable guide rollers 9 and 10 to the cylinder, a layer of the blanket being arranged outside of each layer of the fabric.

While the cylinder, which is preferably about 30 inches in diameter, is being wound with a sufficient length of fabric, as for instance, 100 yds., steam at about the temperature and pressure above noted, is discharged through the hollow perforate pipe 3, through the perforations of the cylinder, and through the fabric and the blanket wound thereon.

Directing or baffle plates 11 are provided for directing the steam through a segment of about 90° of the cylinder, and this segment of the fabric and blanket is subjected to the action of the steam at one time. During the winding of the fabric and the blanket, the steam is injected into the cylinder, the cover 5 being open at this time, and after the completion of the winding, the cylinder is kept turning back and forth, for about from one-half to two minutes, so that every part of the fabric and blanket is thoroughly and evenly permeated with the steam.

After the completion of the steaming, the steam is drawn off through the inside of the cylinder, by means of a pump 12 having its inlet connected with a pipe 13, which in turn is connected with a bearing hub 2*a*, so that when the pump is operating, air will be drawn through the opening of the housing, through the blanket and fabric on the cylinder, and through the perforations of the cylinder and bearing hub 2*a*, thus removing the steam, and at the same time cooling the fabric. The cooling operation takes one-half to two minutes.

The fabric is now unrolled, passed over a folding device, and the blanket is rolled upon the supply roll 7. Steam is supplied by a pipe 15, which connects with the perforate pipe 3, and has a branch 16 connecting with a perforate pipe 17 within the housing, between the cylinder and the bottom of the housing. The pipe 13, before mentioned, also has a branch 18, which communicates with

the bottom of the housing, below the pipe 17. Valves 19 and 20 are provided for closing communication between the pipe 13 and the perforate pipe 3, and between the branch 18, and the pipe 13, respectively.

In accordance with another method of procedure, the fabric is wound with the blanket onto the cylinder, as before stated, but without steaming. That is, the blanket and fabric are wound up completely, and fastened in position before steam is turned on. When the steam is turned on, the cover 5 is closed, and the steam branch inlet 17 is opened. The steam is admitted between the housing and the cylinder, filling the space between the housing and the outer layer of the blanket with steam. The pump 12 is operated to draw the steam through the blanket and the fabric to the inside of the cylinder, from whence it is withdrawn through the hub 2*a* and pipe 13. This procedure is indicated in Fig. 2, only those parts of the steam supply and the pump connections which are used, being indicated.

In another method of procedure, the fabric is wound into the blanket on the cylinder, as above stated, no steam being used until the winding is completed. The cover is now closed and steam is admitted to the inside of the cylinder, during a period of from two to five minutes. The steam is then drawn off through the fabric and the blanket, through the perforations of the cylinder, and through the pipe 13, the fabric being cooled at the same time. This method of procedure is shown in Fig. 3.

Another method of procedure, which is shown in Fig. 4, is to steam the fabric by either of the methods previously described. After the steaming, the cover 5, if it has been closed, is opened, the warm fabric is unwound, and passed over a perforate cooling roller 22, and through a suitable folding device 23. The steam and cooling air are drawn through the fabric as it passes over the roller 22. This roller has a hollow shaft 25, from which leads a pipe 26 to the top of the pipe 13, before mentioned, a valve 26 being arranged at the junction of the pipes. In carrying out either of the four procedures, the fabric is first thoroughly and uniformly permeated with the low pressure saturated steam, and afterwards the fabric is cooled, by the withdrawal of the steam, and the circulation of air through the meshes thereof.

Fabrics of synthetic fiber treated in accordance with the improved method, are changed in character and aspect. The synthetic fiber is swollen and opened by the moist saturated steam, and the results obtained are manifold, but vary according to the nature, structure and weave of the synthetic fabric. The weave comes out pronounced, and the feel of the fabric is like natural silk. The color is deepened and enriched, and the grayish tint often visible, particularly in blacks, disappears. The rough harsh feeling of the fabrics known as crepes, is eliminated, leaving them soft and mellow to the touch. The fabrics so treated present the appearance of a much finer weave, with greater and uniform density.

It will be understood that suitable valves are provided in the pipe 15 and the branch 16, to control the steam supply, and to direct the same into the desired part of the machine, that is, into the pipe 3, or into the pipe 17.

What is claimed as new is:—

The process of treating fabrics of synthetic fiber with the result of removing the flat high lustre, swelling the fiber and softening the fabric, consisting in permeating the fabric with steam at a pressure of approximately 15 lbs. and temperature of approximately 213° F., and thereafter cooling the fabric and withdrawing the steam by forcing air through the fabric.

Signed at New York in the county of New York and State of New York this 1st day of April, A. D. 1929.

ADOLPH WALTER BUHLMANN.