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METHOD OF DECATING FABRICS

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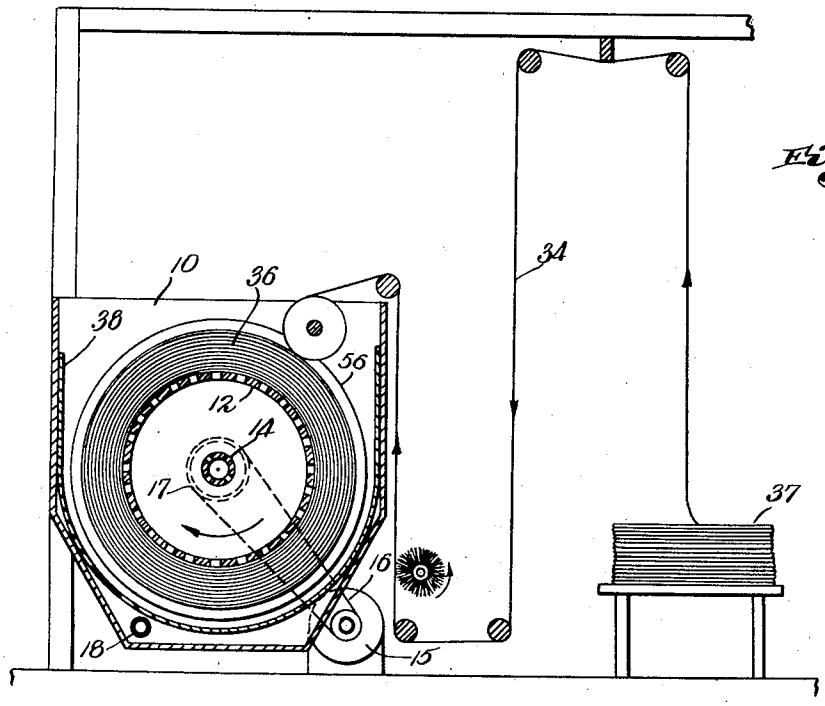


Fig. 1

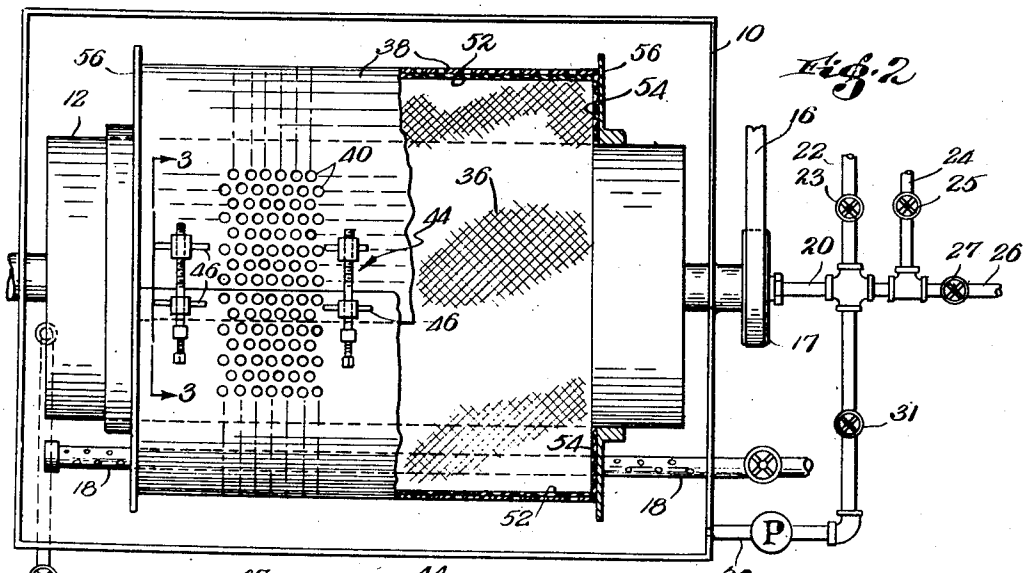


Fig. 2

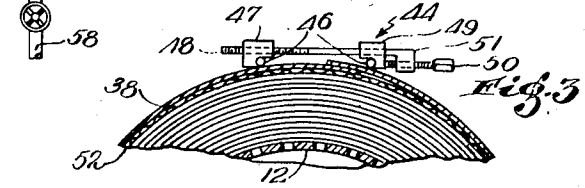


Fig. 3

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METHOD OF DECATING FABRICS

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1 Claim. (Cl. 26—1)

1

This invention relates to a new and improved method of finishing textile fabrics and more particularly to improvements which include both wet decating and steam finishing methods and machines heretofore employed, with the resultant effect of greatly increased production and a substantially superior product, all at substantially reduced labor and heat requirement costs. The invention contemplates the wrapping into a cylindrical body on a foraminous cylinder a much larger quantity of fabric to be treated than has been possible to treat in one operation by the methods and machines heretofore known, maintaining and protecting the fabric in its flat and overlapping relation by the application of a foraminous and flexible holding sheet of tough and non-stretchable material, as rustless metal or plastic, to and in flat, continuous, and overlapped end pressure contact with the circumference of the body, and finishing the fabric by forcing treating fluids radially through the body while thus supported. The improved method not only makes possible the more rapid handling of substantially greater quantities of the fabric by a substantially reduced amount of labor but furthermore permits the treating of the fabric in large rolls of varying size and high fluid pressure at substantially reduced heat costs and produces a smoother and superior product having uniformly desirable surface finish. The production of an improved method of this nature for the purpose described comprises the primary object of the invention.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawing in which,

Fig. 1 is a transverse sectional view through an apparatus embodying my invention,

Fig. 2 is a fragmentary plan view, partially broken away, and

Fig. 3 is a fragmentary view taken on line 3—3 of Fig. 2.

In the drawing I have illustrated the invention as used in wet decating, i. e. the treating of the fabric by steam or hot water to render the fabric or fibre plastic, and then following such treatment with a cold water chill which fixes and sets the fabric. In the drawing 10 indicates an oblong tank open at the top and adapted to contain a treating bath of liquid. Rotatably mounted in the tank is a foraminous cylinder 12. The axles of the cylinder are of tubular construction and are in communication with a perforated pipe 14 passing axially through the cylinder. The cylinder is adapted to be rotated by a motor 15 operating through a belt 16 on a belt wheel 17.

The liquid bath in the tank is adapted to be

2

heated by steam from a perforated pipe 18. Treating fluid is passed into and circulated through the cylinder through a pipe 20. Hot water, cold water and steam connections are provided as at 22, 24 and 26 together with shut-off valves 23, 25 and 27. A circulating pipe connection to the tank is provided at 30 together with a pump P and a shut-off valve 31.

The cylinder 12 is adapted to receive a fabric 34 thereon to form a cylindrical body 36 of fabric wrapped in flat and overlapping relation from a supply 37 by known procedure and apparatus. This cylinder of fabric is thereafter treated to give proper and desirable finish to the cloth. The wet decating and steam finishing methods heretofore employed for this purpose have various limitations and the primary object of my invention resides in the production of an improved treating method that substantially increases production at less cost and produces a substantially superior product.

My invention contemplates the employment of a foraminous jacket for the fabric cylinder 36 that can place and hold a relatively large body of the fabric flat and under substantial pressure during the finishing treatment. In the drawing I have illustrated the jacket as comprising a single sheet 38 perforated at 40. The sheet will be constructed from a material which is sufficiently flexible to wrap tightly about the fabric cylinder and sufficiently tough and non-stretchable to stand the substantial tension placed on it when clamped in working position on the fabric. The material which I preferably employ is a rustless metal, as copper, Monel metal or stainless steel, or a suitable plastic. Clamping means are provided on the two ends of the sheet for drawing it into tight contact with the fabric. A suitable number of properly spaced clamps are employed and, as illustrated, each embodies a clamping unit 44 cooperating with pieces 46 of rod stock welded to the outer face of the ends of the metal sheet 38. Each clamping unit comprises a block 47 threaded to a rod 48 and having a cooperating block 49 slidable thereon. A power screw 50 threaded through the head 51 of the rod is adapted to engage the block 49. Tightening of the screw 50 is adapted to draw the blocks together and further adjustment is provided by the threaded engagement of the block 47 on the rod.

The jacket sheet 38 is resilient and normally assumes a flat position in a single plane. A preferred method of using the sheet is illustrated in Fig. 1 wherein the sheet is disposed U-shape about the cylinder 12 in and adjacent to the bottom and sides of the tank with its ends spaced apart and open at the top of the tank for reception of the fabric 34. The fabric is wound tightly onto the cylinder 12 to form a fabric cyl-

inder 36 of a size that can be suitably and conveniently treated. The fabric cylinder is covered by a cotton cloth 52, this cloth being attached to the final end of the fabric 34 and wrapped in a plurality of plies about the fabric cylinder and being somewhat wider than the fabric and overlapping the ends of the fabric cylinder at 54. This cloth cover aids in supporting the fabric in flat relation and in diffusing the treating fluid. The jacket sheet 38 is then wrapped about the cloth covered fabric roll, its ends overlapped as illustrated in Fig. 3, and the clamping units 44 are applied. End plates 56 slidable on the cylinder 12 are brought up into contact with the ends of the jacket 38 and fabric cylinder, thereby completely enclosing the fabric, and the clamping units are tightened to place the fabric under substantial compression holding it flat during the subsequent treatment.

The treating of the fabric cylinder 36 is effected by running hot water into the cylinder 12 and outwardly through the fabric to completely submerge the fabric cylinder and the hot water is then circulated in both directions radially through the roll of fabric for a predetermined period of time sufficient to complete the desired treatment. The water is kept to boiling temperature during this treatment by steam injected into the tank through the pipe 18. The cylinder 12 together with the fabric are rotated constantly during the treatment.

When the hot water treatment has been completed, the hot watler is drawn off through a drain 58 and cold water is run into the cylinder 12 and outwardly through the fabric to submerge the fabric roll and is thereafter circulated through the roll in both directions radially until the fabric has been thoroughly cooled. It will be apparent that the confining of the fabric by the jacket 38 and the closing of the ends by the plates 56 causes all the water to be forced radially through the fabric while the layers are held firmly in place with no chance to lift or separate and thus cause uneven finish. The jacket 38 is placed under a considerable tension, placing the cloth under substantial pressure, thereby preventing any looseness of the overlapping fabric layers that would deleteriously affect the finish, feel and appearance of the fabric.

It is pointed out that I employ a foraminous jacket with overlapped ends for very definite and important reasons. First, the fabrics to be wrapped on the foraminous cylinder 12 and treated vary in length and thickness sufficiently also substantially to vary the circumference of the cylindrical wrapped fabric body. A jacket of exact circumferential size cannot be brought into tight contact with such varying bodies, whereas the employment of my invention permits of a considerable circumferential variation and effects continuous and complete pressure contact with bodies thus varying in size while permitting the treating liquid to pass therethrough. Second, to secure uniform treatment and uniform surface lustre on the fabric it is imperative that the entire circumferential surface shall be confined with equal pressure at all points, failure thus to confine the body resulting in the development of surface shades that spoil the uniform character of the product. Third, the overlapped ends of the jacket effect a continuous and complete surface contact of the fabric body whereas a jacket with abutting ends drawn together produces a non-

pressure gap at the joint and detrimental impression marks on the fabric body. Fourth, the tight and complete binding of the fabric body throughout its entire circumferential surface holds the fabric against shrinkage in width during the treatment. The tight and complete confining of the body furthermore permits the use of higher and more efficient fluid pressures and the production of a superior finish in addition to speeding up the treating time required.

The employment of my improved method serves various useful and important functions not heretofore possible in known cloth finishing methods and apparatus. The tight and secure binding of the fabric permits the use of higher fluid pressure in the treatment and is particularly effective in securing a superior finish by the quick chill from hot to cold thus obtained. The higher fluid pressure furthermore shortens the treating cycle and thereby substantially increases production. Furthermore, whereas heretofore fabrics have been treated in rolls approximately 18" in diameter, my invention treats rolls of 36" diameter, thereby not only substantially increasing the production per man employed but also making a tremendous saving in heat units required.

The method is likewise applicable to steam-finishing employing steam instead of hot water. In such case the fabric cylinder after being placed under compression by the jacket 38, is subjected to steam passed inwardly of the cylinder 12 and radially outward through the cylinder 12, fabric roll 36 and jacket 38. When the steam treatment has been completed it is followed by cold water forced outwardly through the jacket, thereby quickly cooling the product.

Having thus disclosed by invention what I claim as new and desire to secure by Letters Patent is:

A method of decating textile fabrics, which consists in wrapping an open strip of fabric in flat and direct overlapping relation on and about a foraminous cylindrical surface to form a cylindrical fabric body of substantial diameter and length on said cylindrical surface, enclosing and highly compressing said body uniformly and continuously at and throughout its outer cylindrical surface by continuous pressure contact of a smooth, cylindrical and unyielding foraminous surface with said outer cylindrical surface, and forcing decating fluid under high pressure radially through said foraminous surfaces and said cylindrical fabric body while holding the body highly compressed radially and uniformly by and between said foraminous surfaces.

WILFRED N. HADLEY.

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