

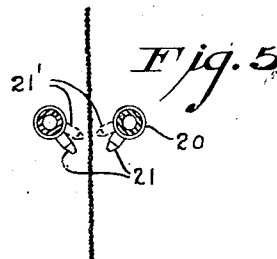
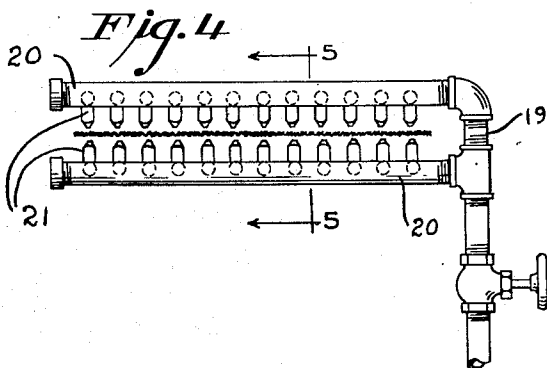
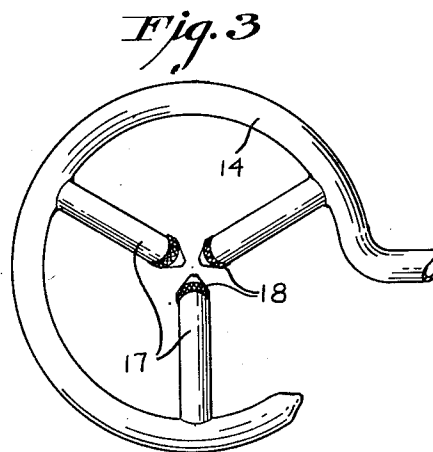
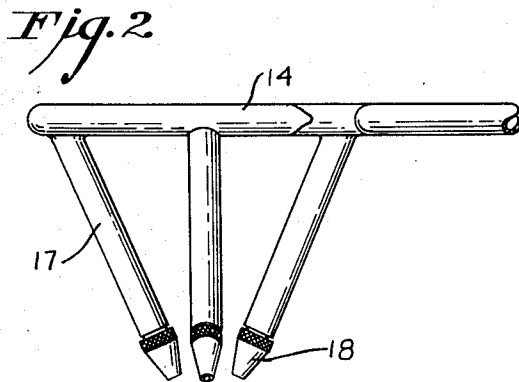
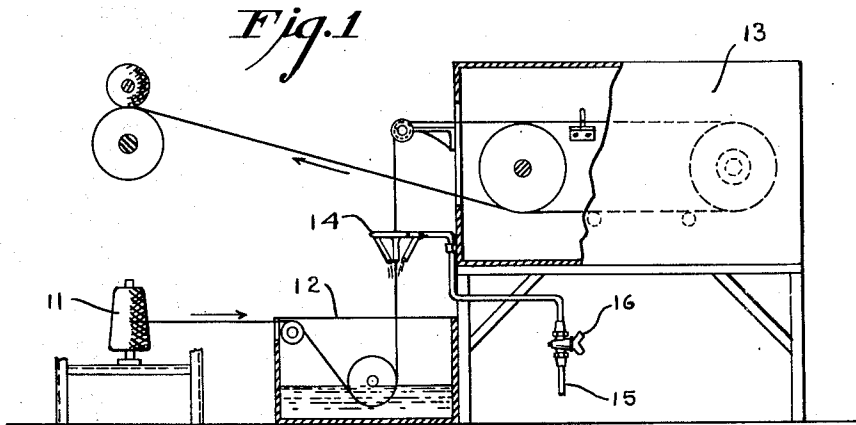
Oct. 24, 1939.

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2,177,323

METHOD AND APPARATUS FOR CONTROLLING THE IMPREGNATION OF TEXTILES

Filed Oct. 7, 1937



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2,177,323

METHOD AND APPARATUS FOR CONTROLLING THE IMPREGNATION OF TEXTILES

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Application October 7, 1937, Serial No. 167,816

4 Claims. (Cl. 8—151)

This invention relates to a method and an apparatus for controlling the impregnation and sizing of textile materials.

In the manufacture of textiles, generally, it is common practice to treat the materials with solutions of various organic and inorganic substances in order to modify the physical or chemical characteristics of the basic fibre. Such treatment may take place during the manufacture of the individual threads or after they have been woven or otherwise formed into a finished product. In such treatment of textiles, one of the principal problems is the control of the amount of sizing or impregnating material remaining on the textile after passing through the sizing bath.

The present invention resides in a device by which excess sizing material may be removed from the textile as it issues from the treating bath and a uniform coating of the desired density may be obtained upon the material. Furthermore the present device is susceptible of modification in structure or adjustment so as to force surface coatings into the body of the textile thereby controlling the degree of penetration of the treating solutions.

The invention will be more fully described in connection with the accompanying drawing in which:

Fig. 1 is an elevation partly in section showing the control device in operative relation to the usual elements of a sizing mechanism;

Fig. 2 is an enlarged elevation of one form of control manifold;

Fig. 3 is a plan view of the manifold of Fig. 2;

Fig. 4 is a plan of a modified form of control manifold in operative relation with a section of woven tape; and

Fig. 5 is a vertical section along line 5—5 of Fig. 4.

In the conventional sizing or impregnating devices, textile material is run through a treating bath, excess treating solution is removed and the material is passed through a drier. Fig. 1 illustrates such a set up in which yarn from a supply 11 passes through a treating bath 12 and into a drier 13. The control device of the present invention is positioned immediately above the bath 12 and operates to control the amount of size remaining on the yarn after it leaves the bath. This control device consists of a manifold 14 connected with a suitable source of gaseous fluid under pressure by means of pipe 15. A valve 16 controls the flow of fluid to the manifold. The manifold shown in Fig. 1 is shown in

enlarged detail in Figs. 2 and 3 and consists of a manifold pipe 14 from which extend a number of short pipes 17 converging toward a point on the axis of the assembly. Each of these pipes terminates in a removable nozzle 18. In operation the yarn rises from the sizing bath and passes vertically upward through the center of the control device. Air, or some similar gaseous fluid under pressure, issues in jets from the nozzles 18 and impinges on the yarn from all sides. These jets of air tend to center the yarn between them and to blow surface sizing fluid back down the yarn into the sizing bath. Regulation of the speed at which the yarn advances through the manifold and the jet pressure determines the amount of treating fluid remaining on the yarn after it passes the control device.

Figs. 4 and 5 illustrate another modification of the invention. In this structure, the control manifold 19 includes a pair of closely spaced parallel arms 20 provided with a plurality of drilled holes or short nozzles 21. The arms 20 are sufficiently long to extend beyond the edges of the strip of fabric 22 which it is desired to treat and are rotatable with respect to the manifold 19 so that the angle at which the jets impinge on the material may be adjusted as desired. Such adjustment is shown in Fig. 5, an additional position of the nozzles being shown in dotted lines at 21'.

Control devices embodying the teachings of this invention have many advantages over the squeeze rolls and similar devices of the prior art. Most textile fibres lose a considerable part of their tensile strength when wet and when mechanical means are brought to bear on yarns and fabrics in this condition, the opportunity for damage to the material is greatly increased. By the use of a gaseous fluid media in direct contact with the material, the excess treating fluid is uniformly removed regardless of variations in surface contour and the abrasion of mechanical implements is entirely avoided. Regulation of the fluid pressure applied to the manifold provides an infinitely flexible adjustment of the force removing the excess size while to a considerable extent the penetration of the size to the interior of the material may be regulated by varying the angle at which the jets of fluid impinge upon the material.

The gaseous fluid medium most commonly utilized by this device is compressed air, but various other gases may be used, such as those which will produce coagulation of latex and the

cellulose derivatives, when such materials are incorporated in the treating bath.

While the devices which have been described by way of illustration each include manifolds to which are attached a plurality of nozzles, it is obvious that openings in the manifold itself such as drilled holes, slots and the like, may be utilized in certain instances to advantage and that these and further modifications are to be permitted within the scope of the appended claims.

I claim:

1. The method of controlling the sizing and impregnation of textile material which comprises passing the material through a solution of the sizing material and impinging jets of gaseous fluid under pressure against said material at an acute angle thereto and contra to its direction of motion to remove excess sizing material and force the retained sizing material into the textile.

2. The method of controlling the sizing and impregnation of textile material which comprises passing said material through a treating bath and subsequently directing a jet of gaseous fluid under pressure against said material in opposition to its direction of motion to remove excess sizing material and force the retained siz-

ing material into the textile, and regulably controlling the angle of inclination, and the intensity of said jet to vary the amount of sizing material removed and the amount forced into the textile material.

3. In a device for treating textile materials, a treating bath, means for passing a body of textile material through said treating bath, a manifold substantially surrounding said material as it leaves said bath, means for regulably supplying said manifold with gaseous fluid under pressure and a plurality of nozzles attached to said manifold and converging toward the material issuing from said bath in a direction opposite to its direction of motion, said nozzles being sufficient in number and so positioned as to entirely surround said material with jets of fluid impinging thereon.

4. The method of controlling the sizing and impregnation of textile yarns which comprises passing the yarn thru a sizing bath and subsequently impinging a plurality of converging jets of gaseous fluid on said yarn thruout its periphery in a direction opposite to its direction of movement to remove excess sizing material and force the retained sizing material into the yarn.

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