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TREATMENT OF TEXTILE MATERIALS

Filed March 19, 1931

FIG. 1.

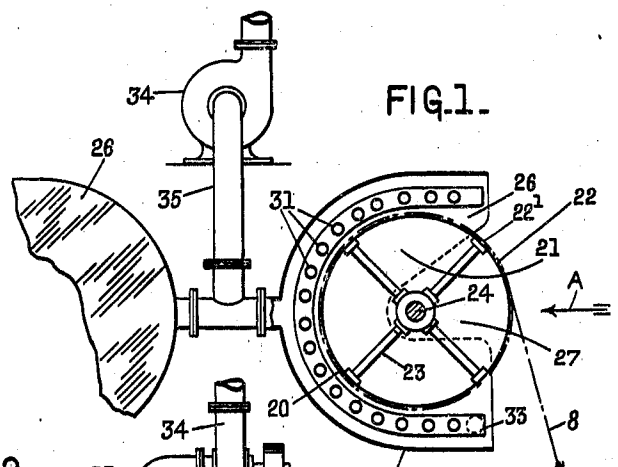
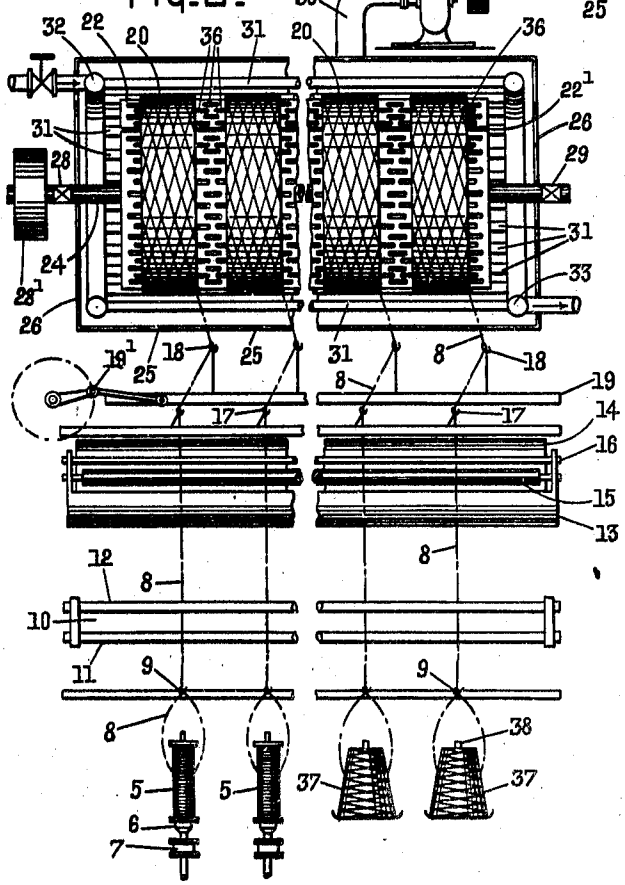


FIG. 2.



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TREATMENT OF TEXTILE MATERIALS

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2 Claims. (Cl. 117—2)

The present invention relates to the treatment of yarns by the application thereto of a liquid treating material, for example, a sizing liquid, its principal object being the production of such yarns in the form of hanks. It is a further object of the invention to carry out the twisting of yarns simultaneously with the liquid treatment and the formation of the yarns into hanks. The invention is of particular advantage in the application of a sizing liquid to the yarn, but it will be understood that treating liquids other than sizes may be applied to the yarn during the hanking operation.

According to the invention yarn is led from a bobbin or other package, passed over a device which applies to it any desired liquid, e. g. size, and then wound into a hank, drying of the yarn being effected during winding.

The drying may be effected simply by the movement of the yarn through the air by the rotation of the reel on which it is wound. In the case of liquids which do not dry so readily or in the case of heavier applications of liquid, the drying may be accelerated by the application of heat. Thus the reel may be wholly or partially enclosed in a heated atmosphere, or surrounded by heated pipes, air being directed on to the yarn on the reel either by the rotation of the reel itself or by the aid of a suitably disposed suction fan or blower.

The yarn may be drawn from any kind of packages, such as bobbins, cheeses, or hanks, and separate reels may be used for each yarn to be hanked or the reels may be of such a length as to accommodate several hanks.

In order to prevent kinks being formed in the hanks, particularly when the yarns have been treated with size, it is preferred to use a reel having a cylindrical periphery. For example, a cylindrical shell of perforated metal may be removably mounted on the arms of the reel, or each arm may have connected thereto a curved perforated plate extending to and resting on the next arm.

The operation may be accompanied by a twisting of the yarn as it is drawn from the package, the twisting taking place at a rate governed by the degree of twist and the speed of hanking.

The invention which is applicable to the treatment of all sorts of textile yarns, but is particularly useful for the treatment of cellulose acetate or other forms of artificial silk, whether in the form of continuous filaments or spun yarn, enables the production of hanks of treated yarn to be carried out at a high rate, and allows of large amounts of yarn being treated without frequent stoppage of the operation.

The invention will now be described in greater detail with reference to the accompanying drawing and in its particular application to the treatment of yarns with a sizing liquid, but it is to be understood that the following description is given by way of example only, and is in no respect limitative.

Fig. 1 is a side elevation, partly in section, of the sizing machine according to the invention.

Fig. 2 is a front elevation of the machine shown in Fig. 1.

Referring to the figures, a bobbin 5 is mounted on a spindle 6, driven from a whirl 7. The yarn 8 is led from the bobbin 5 to a balloon guide 9 and thence to a tensioning guide 10, consisting of two staggered bars 11 and 12. The tension guide 10 provides the required tension in the yarn as it passes over the sizing device. The sizing device consists of a bath or trough 13 containing the sizing material, into which dips a furnishing roller 14, size being transferred from the furnishing roller to a sizing roller 15 over which the yarn passes. The yarn is held in contact with the roller 15 by a guide bar 16. A coating of size is imparted to the yarn as it passes over the roller 15, the yarn being then led to the first guide 17 of the reeling mechanism. From the stationary guide 17 the yarn passes to the traversing guide 18, carried upon the traversing rod 19 which is oscillated by means of a crank 19' to lay the yarn in diamond pattern as a hank 20 upon the reel 21.

In order to avoid kinking of the sized thread in the hank 20, the reel 21 is constructed of a perforated metal sheet 22, bent into the form of a cylinder and sprung outwards by the arms 23 of the reel, which are mounted on a shaft 24. The edges 22' of the sheet 22 abut against one another over one of the arms 23. The whole reel is contained in a casing 25, with end plates 26 cut away to a suitable shape at 27, to allow the shaft 24 to pass through. The shaft 24 is mounted on bearings 28, 29 outside the casing 25, one of which bearings, as at 28, may conveniently be a U-bearing. In the modification shown, a large reel is used, driven by a pulley 28', capable of receiving a number of hanks 20. The winding operation is started on all the hanks simultaneously, and when winding is completely the entire reel 21 is removed from the casing by lifting one end of the shaft 24 out of the U-bearing 28, and sliding the whole reel 21 out of the casing 25.

The sized yarn on the reel is dried while it is

being wound by means of heating pipes 31 partly surrounding the reel, and supplied with steam from a header 32, the steam being withdrawn from an exhaust header 33. Air is drawn through the casing 25 during the rotation of the reel by means of a suction fan 34 and air trunks 35. The air impinges upon the sized yarn to dry the size, circulation through the inside of the reel 24 being permitted by the perforations 36 in the metal sheet 22. It will be seen that in Fig. 1 a portion 26 of a similar machine is shown through which air is drawn by the same fan 34. It will be clear that the remainder of this machine is precisely similar to that already described, the two being disposed symmetrically.

As shown in Fig. 1, and on the left-hand side of Fig. 2, the yarn may be twisted as it leaves the supply packages 5, which are rotated by means of the wharl 7, at a rate higher than the winding-off rate of the yarn. Alternatively, as shown on the right-hand side of Fig. 2, the yarn may be taken from cones 37 or other suitable packages without twisting, and passed through the balloon guide 9 to the sizing device. In this case the cone will simply be mounted upon a peg 38.

On removal of the reel 21 from the jacket 25, the support of the arms 23 is withdrawn, so that the cylindrical sheet 22 collapses, permitting the removal of the hanks. The hanks may then be placed on cores or formers or otherwise packed for transport or they may be rewound into any desired form of package.

The size which is applied to the yarn may be of any kind suitable or appropriate to the yarn under treatment to provide a coating of dressing having any desired characteristics. For example, in the case of cellulose acetate yarn starch size, gelatine size, with or without softening agents such as castor oil or glycerin, or the sizes described in U. S. applications S. Nos. 491,070 of 24th October 1930, 514,898 and 514,899 both of 10th February 1931 and U. S. application S. No. 535,287 filed March 5, 1931 may be used.

What we claim and desire to secure by Letters Patent is:—

1. Apparatus for the treatment of yarns, comprising in combination a twisting device adapted to support a yarn package, means for applying a liquid to twisted yarn drawn from said package, a winding device for forming the treated yarn into a hank, a casing surrounding said winding device, and means for supplying a drying medium to the interior of said casing.

2. Process for the treatment of yarns and the like comprising, as a continuous operation, drawing yarn from a package, twisting the yarn as it leaves the package, applying a liquid to the yarn, winding the yarn in the form of a hank, supplying a drying medium to the hank during winding and maintaining the hank substantially enclosed during the operation so as to concentrate thereon the action of the drying medium.

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