June 20, 1944. W. WHITEHEAD ET AL 2,351,729

TINTING MECHANISM

Filed Nov. 26, 1940

Fig. 1.

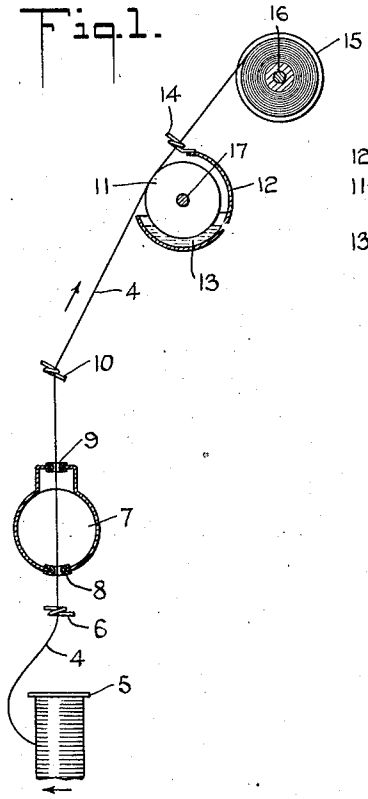


Fig. 2.

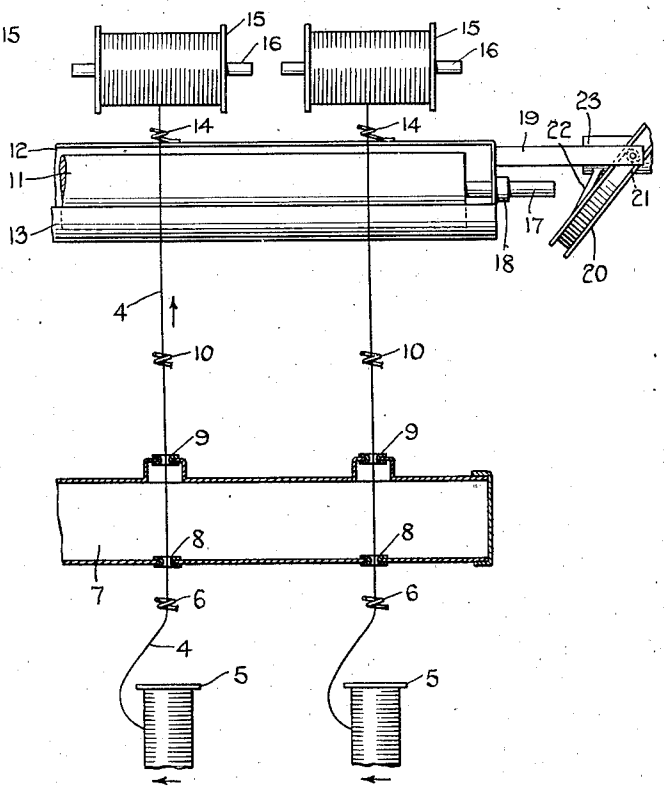
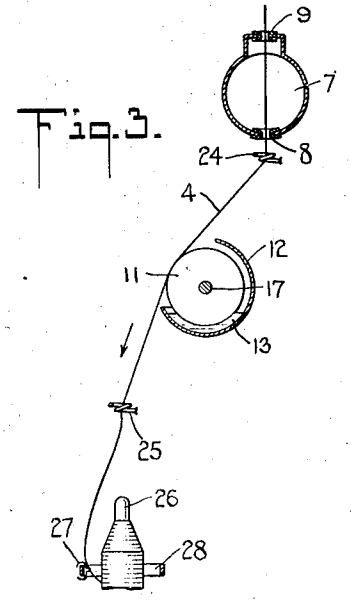


Fig. 3.



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TINTING MECHANISM

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2 Claims. (Cl. 68—202)

This invention relates to the tinting of yarns, and relates more particularly to the fugitive tinting of yarns for purposes of identification.

An object of our invention is the provision of means for applying tinting solutions uniformly to rapidly moving yarns while said yarns are being wound and/or twisted on to bobbins.

A further object of our invention is the provision of means for traversing the yarn as it is being tinted so that it may be wound evenly on said bobbins.

Still a further object of our invention is the provision of tinting means for highly twisted yarns useful in the weaving of crepe fabrics.

Other objects of our invention will appear from the following detailed description.

In the application of tints to yarns, and particularly in the application of fugitive tints to yarns for the purposes of identifying the yarns, it is highly desirable that the depth of shade along the length of the yarn be uniform since it is only when the color is uniform that the yarn can be easily and quickly identified. In addition, uniformity of tint minimizes any tendency toward ringiness or streakiness in a particular bobbin of yarn or also avoids any variations in shade from cone to cone which detract from the appearance and saleability of the yarn. Not only does uniformity of shade result in these obvious advantages, but it also enables the tint to be removed from the yarn by a standardized procedure. In a particular tint application where the tint applied exhibits wide variations in shade, some of the tint may be removed from the yarn by merely applying cold water but to remove the remaining tint it may be necessary to use hot water. In some cases even the application of hot water is unavailing, and it is then necessary to treat the yarn drastically as by heavy scouring, bleaching or both, frequently to the detriment of the yarn or fabric properties.

Our invention will now be described in detail with reference to the accompanying drawing, wherein there is shown a device, incorporating certain preferred embodiments, for applying tints to a moving yarn.

In the drawing

Fig. 1 is a side elevational view of our novel tinting mechanism showing a tint being applied to a yarn, by a suitably driven roller set in a trough, while the yarn is wound after it is twisted by being drawn over the end of a rotating package and passed through a steam chamber;

Fig. 2 is a front elevational view of the mechanism of Fig. 1 showing the driving and traversing means for the tint trough and roller, the yarn guides, the take-up spools, the steaming chamber and the yarn feed bobbins; and

Fig. 3 is a side elevational view of another embodiment of our invention showing the steaming chamber, the tinting roller and a suitable ring and traveler for imparting twist to the yarn as it is being drawn downwardly and wound to form a suitable package of twisted yarn.

Like reference numerals indicate like parts throughout the several views of the drawing.

In the device of our invention, a yarn 4 is twisted by being drawn continuously over the end of a rotating bobbin 5 being driven at very high speed in a clock-wise direction by suitable means (not shown). The yarn being twisted is guided by a pigtail guide 6 into a steaming chamber 7 which is provided with suitable openings 8 and 9 through which the yarn 4 enters and leaves. By means of a pigtail guide 10 above the steaming chamber 7 at which the direction of the yarn path is changed, the twist which is being inserted in the yarn is prevented from running beyond the guide 10 and in this way substantially all the twist is inserted in the yarn between the pigtail guides 6 and 10 while it is under the influence of the steam in chamber 7. As is well known in the art, the action of the steam serves to set the twist, thus enhancing the creping properties of the yarn. After the twist has been inserted, the tint is applied to the yarn by drawing it over a rotating roller 11 set in a semi-circular concentric trough 12 which holds a quantity of tinting solution 13 in which the roller 11 is partially submerged so as to pick up the tinting liquid. The yarn after being tinted passes through another pigtail guide 14 and is taken up by a take-up spool 15 carried on and driven by a shaft 16. The roller 11 is rotated by a suitably powered drive shaft 17 journaled in a bearing 18. In addition to the rotary movement of the roller, the tinting trough 12 and roller 11 are traversed horizontally by the action of a traverse bar 19 so that a uniform amount of tinting liquid is applied to the yarn as it comes in contact with the roller. The reciprocating horizontal movement of the traverse bar 19 is produced by the rotation of a circular, peripherally-grooved cam 20 which engages a rotatable cam follower 21 set at the end of the traverse bar 19. The rotation of the cam 20 causes the cam follower 21 to slide in the groove of cam 20 forcing the bar 19 to move back and forth horizontally as the cam 20 rotates. The cam 20 is mounted on a spider 22 which is attached at the other end to a hollow

boss 23 keyed to a suitable driving shaft (not shown). In addition to the traverse motion causing a uniform amount of tinting liquid to be applied to the yarn, said motion causes the yarn passing through pigtail guide 14 to traverse the take-up spool 15 and to wind evenly on said rotating spool forming a uniform package of tinted yarn. The shaft 17 which turns the roller 11 is rotated during its traverse motion as by a suitable slider gear (not shown) so keyed to the shaft 17 at any convenient point outside the trough 12 that it will mesh uninterruptedly with a complementary driving gear during the entire traversing motion.

As an alternative, the yarn may be tinted after the insertion of the twist as shown in Fig. 3. In doing this, the yarn 4 is drawn downwardly through a steaming chamber 7, provided with suitable openings 8 and 9 to permit the passage of the yarn therethrough. After being steamed, the yarn 4 is then drawn through a pigtail guide 24 and tint is applied by leading it over the rotating tinting roller 11 set in the trough 12 and partially submerged in the tinting solution 13. The roller 11 is supported and rotated by shaft 17. Both the roller 11 and the trough 12 are given a reciprocating horizontal traverse motion while the yarn is in motion by the means described above in detail. After being tinted, the yarn 4 passes through a pigtail guide 25 and is then wound on to a pirn 26 rotating at high speed. The twist is inserted in the yarn by the action of a traveler 27 through which the yarn passes as said traveler is carried about a ring 28, the device being a twisting means well known to the art. The arrangement of the parts is such that the twist being inserted in the yarn runs back and substantially the greatest portion is inserted while the yarn is under the influence of the steam in the chamber 7. In this way the tint is applied after the yarn is twisted.

While our invention is applicable for the tinting of various types of yarns such as those made from cotton, wool, silk, the regenerated cellulose type of rayon and mixtures thereof, it is particularly applicable for the tinting of yarns of organic derivative of cellulose materials, and particularly such yarns in which a high degree of twist has been inserted with the object of obtaining crepe yarns. Yarns made from organic esters of cellulose and cellulose ethers are suitable. Examples of organic esters of cellulose are cellulose acetate, cellulose propionate, cellulose butyrate and mixed esters such as cellulose aceto-propionate and cellulose aceto-butyrate, while examples of cellulose ethers are ethyl cellulose and benzyl cellulose.

It is to be understood that the foregoing detailed description is merely given by way of illustration and that many variations may be made therein without departing from the spirit of our invention.

Having described our invention, what we desire to secure by Letters Patent is:

1. In a device for coloring travelling yarns, the combination with a movable, color-carrying surface to contact said yarn, of means for supplying coloring material to said surface, means for causing said movable, color-carrying surface to traverse across the path of said travelling yarn and traversing guide means for guiding said travelling yarn on to a take-up package.

2. In a device for coloring travelling yarns, the combination with a rotatable cylindrical color-carrying roller to contact said yarn, of a concentric trough carrying a coloring solution in which said roller is partially immersed, means including a traverse bar attached to said trough for causing said roller and solution containing trough to traverse across the path of said travelling yarn and guide means on said traversing trough for guiding said travelling yarn on to a take-up package.

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