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1,532,559

G. T. THOMAYER

YARN DYEING DEVICE

Filed May 15, 1924

Fig. 1.

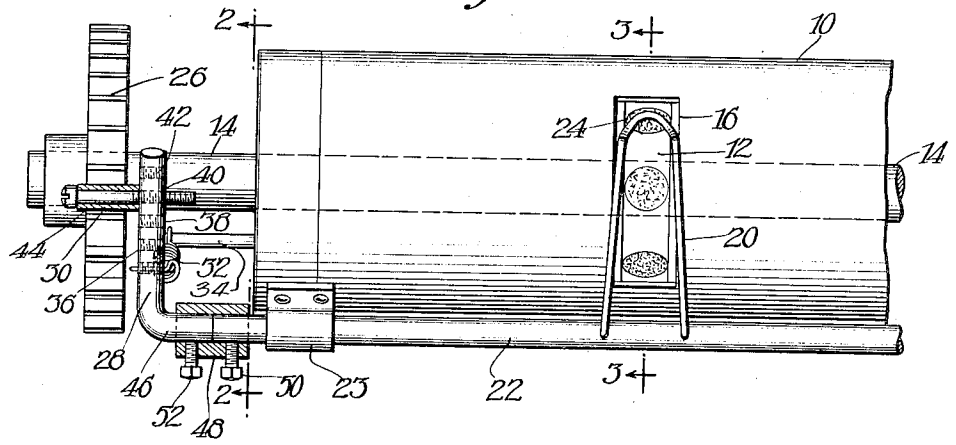


Fig. 2.

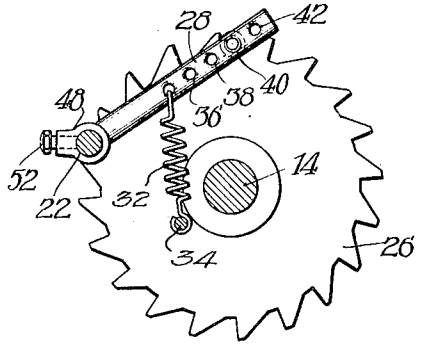
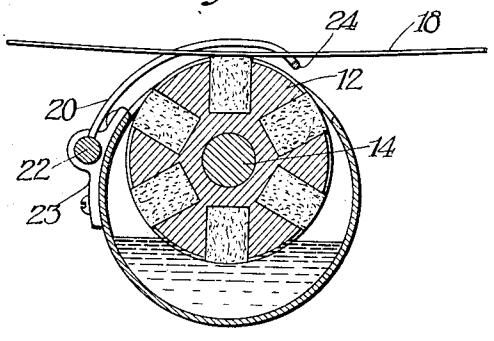


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE T. THOMAYER, OF ALBANY, NEW YORK, ASSIGNOR TO FULD AND HATCH KNITTING COMPANY, A CORPORATION OF NEW YORK.

YARN-DYEING DEVICE.

Application filed May 15, 1924. Serial No. 713,530.

To all whom it may concern:

Be it known that I, GEORGE T. THOMAYER, a citizen of the United States, and a resident of Albany, county of Albany, State of New York, have invented certain new and useful Improvements in Yarn-Dyeing Devices, of which the following is a specification.

This invention relates to a dyeing machine and, more particularly to an apparatus, such as the machine described in my Patent No. 1,488,299, for bringing yarn into and out of contact with a dye applying medium. More particularly, the present invention relates to an apparatus by which the periods of time of contact of the yarn or other filament being dyed with the dye applying means may be readily varied to provide various dyeing effects.

In the machine described in my preceding Patent No. 1,488,299, a tossing movement was imparted to yarn passing continuously over a dye tank by means of fingers, one for each yarn, rigidly mounted on a rock shaft at the side of the tank and given a slight rocking movement to successively lift and lower the yarn supporting ends of the fingers and thus impart the desired tossing movement to the yarn. This rocking movement was imparted to the rock shaft by means of an integral arm extending at right angles to the rock shaft and having a projecting member adapted to ride on a toothed or ratchet wheel acting in the manner of a cam to give a reciprocating movement to this member. In this mechanism the movement of the yarn guiding and actuating fingers is fixed and cannot be readily varied.

An object of the present invention is to provide a yarn randomer or tossing device for dyeing machines in which the position of the yarn during its tossing or vibrating movements may be varied to vary the dyeing effect on the yarn.

Another object of the invention is to provide a tossing or randoming device of the type indicated in which the tossing movement may be varied, and a further object is to provide a device in which the position of the tossed yarn relative to the dye applying means may be varied independently of the variation in the tossing movement.

With these and other objects in view the invention comprises the apparatus described and set forth in the following specification and claims.

The various features of the invention are illustrated in the accompanying drawings in which:

Fig. 1 is a plan view of a portion of a dyeing tank and associated apparatus and of a randoming actuating mechanism embodying my present invention,

Fig. 2 is a sectional or side view of the randoming apparatus taken on line 2—2 of Fig. 1, and,

Fig. 3 is a sectional view of the dyeing tank and apparatus taken on line 3—3 of Fig. 1.

In my present invention a finger actuating mechanism is provided by which the effective length of the actuating arm may be varied in such a manner that by varying the distance from the axis of the rock shaft to its point of engagement with the toothed wheel, the angular position of the yarn guiding fingers and the angular movement of these fingers may be readily varied. The angular position of the actuating arm relative to the yarn guiding fingers may also be varied by an adjustable mounting collar between the rock shaft and the actuating arm which permits the arm to be turned to various angles on the rock shaft. By means of these devices, the vertical position of the yarn guiding portion of the fingers may be adjusted and the movement of the yarn varied to provide different dyeing effects on the yarn.

Referring more particularly to the accompanying drawings, the invention is applied to a dyeing apparatus comprising a dye containing tank 10 partly filled with dye liquor into which dip dye wheels 12, only one being shown in the accompanying drawing, mounted on a rotating shaft 14 extending longitudinally in the tank. The wheel 12 is so positioned that its upper surface projects through an opening 16 in the upper surface of the tank 10 and carries a film of dye liquor from the body of dye upwardly on its rotating periphery to a position to be absorbed by a passing yarn 18 when this yarn is permitted to fall and rest lightly on the uppermost surface of the dye wheel in its passage to a winding mechanism. The shaft 14 may be driven in any suitable man-

ner to provide the desired film on its periphery.

In its passage over the dye wheel, the yarn 18 is tossed upwardly at successive intervals and permitted to fall between these intervals and rest on the upper surface of the dye wheel. This successive tossing of the yarn is obtained by means of a finger 20, rigidly mounted on a rock shaft 22 supported at one side of the tank by means of a bearing 23, the finger 20 being of a hair pin form having a bridge portion 24 over which the yarn passes and is supported and which is given a succession of rising and falling movements as the shaft 22 is rocked. The position of the finger 20, and accordingly of the yarn 18 is accordingly governed by the position and turning of the shaft 22 on its axial line.

A rocking movement is imparted to the shaft 22 from a toothed wheel 26, which may be rigidly mounted on and rotated by the dye wheel shaft 14 or by other suitable means through an arm 28 extending at a right angle from, and rigidly mounted on, the shaft 22 and having a projecting pin 30 riding on the teeth of the wheel 26, which act as a series of lifting cams or wipers and on which the pin is held by means of a spring 32 attached at one end to the arm 28 and at its other end to a pin 34 projecting from the end of the tank 10. The angle through which the shaft 22 rocks, and accordingly the amplitude of movement of the yarn guiding finger 20, the angular position of the shaft 22, and height of the finger above the dye wheel are governed by the distance between the axis of the shaft 22 and the pin 30, a shorter distance giving a larger amplitude of movement and a higher position of the finger 20.

To enable this distance between the axis of the shaft 22 and the pin 30 to be varied the arm 28 is provided with a number of threaded openings 36, 38, 40 and 42, at different distances from the axis of the shaft 22, in any one of which the pin 30 may be inserted. The pin 30 may be provided with a protecting collar 44 to receive the wear from contact with the surface of the wheel 26.

The arm 28 is also so mounted on the shaft 22 that its angular position relative to the finger 20 may be varied. For this purpose, the arm 28 is provided with a portion 46 in alignment with the shaft 22 and is rigidly connected to, and mounted on, the shaft 22 by means of a collar 48 which spans and overlaps the adjacent ends of the shaft and portion 46 and is secured thereto by means of set screws 50 and 52, respectively. By loosening either of these set screws, the collar may be rotated relatively to the corresponding shaft and the position of the arm on the shaft thus adjusted to bring the finger ends 24 to the desired position above the tank 10 regardless of the position of the arm 28.

By means of this invention, therefore, a great variety of tossing movements of the yarn 18 relative to the dye wheel 12 may be obtained by merely adjusting the position of the arm 28 on the shaft 22 and of the pin 30 on the arm 28, which may be easily and readily accomplished as indicated.

As changes of construction could be made within the scope of my invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

Having described the invention, what I claim and desire to secure by Letters Patent is:

1. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm on said shaft, a pin on said arm riding on said toothed wheel, and means for adjusting the position of said pin on said arm.

2. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm on said shaft, a pin on said arm riding on said toothed wheel, and means for adjusting the distance of said pin from the axis of said shaft.

3. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm on said shaft, a pin on said arm riding on said toothed wheel, and means for varying the angular position of said arm relative to said yarn guilding finger.

4. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm on said shaft, said arm having a series of holes a different distance from the axis of said shaft, and a pin insertable into said holes and riding on said toothed wheel.

5. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm having a pin riding on said toothed wheel and a portion in alignment with said rock shaft, and a collar adjustably connecting said rock shaft with the portion of said arm aligned therewith.

6. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm mounted on said shaft, a pin on said arm riding on said toothed wheel, means for

adjusting the distance of said pin from the axis of said shaft, and means for varying the angular position of said arm on said rock shaft relative to said yarn guiding finger.

7. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm having a series of holes at different distances from the axis of said shaft and a portion in alignment with said shaft, a pin mountable in a selected one of said holes and riding on said toothed wheel, and a collar adjustably connecting said rock shaft with the portion of said arm aligned therewith.

8. Apparatus of the type described which comprises, a dye tank, a rotating shaft extending through said tank, a dye applying wheel in said tank mounted on said shaft, a toothed wheel mounted on said shaft outside of said tank, a rock shaft mounted at the side of said tank, an arm having a portion in alignment with said rock shaft and a portion at a right angle thereto and a series of holes in said right angle portion, a pin mounted in a selected one of said holes and riding on said toothed wheel, a collar adjustably connected to said rock shaft and the aligned portion of said arm, and a yarn guiding finger on said rock shaft for guiding yarn over said dye applying wheel.

9. Apparatus of the type described which comprises, a dye applying means, means for passing yarn over said dye applying means, means for tossing said yarn upwardly and permitting it to fall into contact with said dye applying means at successive intervals, and means for varying the relative periods of time in which said yarn is respectively in contact with, and out of contact with, the dye.

10. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding means on said shaft, a toothed wheel, means on the rock shaft for engagement with said toothed wheel, and means for varying the distance between the wheel engaging means and the axis of the shaft.

11. Apparatus of the type described which comprises, a dye tank, dye applying means in said tank, a rock shaft, a yarn guiding finger on said shaft, a toothed wheel, an arm on said shaft, means carried by said arm for riding on said toothed wheel, and means for varying the position thereof on said arm.

GEORGE T. THOMAYER.