UNITED STATES PATENT OFFICE.

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WINDING AND DYEING MACHINE.

1,415,964.


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To all whom it may concern:

Be it known that I, EUGENE A. THOMPSON, a citizen of the United States of America, and resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Winding and Dyeing Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in the process of winding and dyeing yarns and the like and a new and improved apparatus for carrying out the same.

Yarn, thread or similar fibrous material furnished to the manufacturer of knitted fabrics, is ordinarily supplied to a winding machine by means of which it is wound on proper sizes and shapes of cones or bobbins for use in the various knitting machines which produce the knitted fabric and it is preferably during this process of rewinding that my invention is applied to preferably intermittently, or if desired continuously, dye, stain or color the same.

The primary object of the invention is to produce a new process and apparatus capable of applying dye to yarn either in intermittent or continuous lengths, the desired lengths being easily determined and regulated as desired.

My process and apparatus are adapted for applying a series of colors to the length of the yarn and for applying said colors in regular sequence along the length of the yarn as desired.

Further, my invention provides accurate controlling means for regulating the quantity of dye supplied to the yarn.

In the drawings:

Figure 1 is an enlarged elevation partly in section illustrating the dyeing, staining or coloring mechanism applied to a well known winding machine.

Figure 2 is a vertical sectional view of the rotary dye containing and applying apparatus.

Figure 3—3 is a cross section on line 3—3, Figure 2.

Figure 4 is an enlarged detail sectional view of the controlling means for the dyeing fluid.

Figure 5 illustrates a slightly modified method of using the apparatus disclosed in the other figures.

The usual and well known winding machine embodies a vertical spindle —1— having thereon a cone or bobbin —2— on which the yarn, thread or other fibrous material is adapted to be wound from the bobbin —3— suitably carried by the usual support —4—.

In its passage from the bobbin —3— to the bobbin —2—, the yarn is adapted to pass over a suitable rest —5— formed in connection with a nut —6— adjustably mounted upon a threaded rod —7—. Intermediate the rest —6— and bobbin —3— dyeing apparatus of this invention may preferably be supported. The apparatus comprises a pair of guides —8— mounted upon a platform —9— and intermediate the guides a rotary dye containing and applying apparatus —10— mounted upon a shaft —11— journaled in the platform —9— and the frame —12—. The spindle —1— and shaft —11— may be rotated in any suitable manner and at suitable relative speeds to attain the particular dye application desired and for this purpose the spindle and shaft are shown as provided with pulleys.

The dye containing and applying apparatus —10— may, as shown, be in the form of a cylindrical chamber having a vertical wall —14— which may if desired be divided into a plurality of chambers —15— and —16— by a suitable partition —17—, or such partition may be omitted. This apparatus is preferably cup-shaped in form and open at its top and provided with an enclosing cap —18—, which may be secured to the wall —14— in any suitable liquid tight manner as by a threaded engagement and suitable interposed packing.

A second wall —19— is formed around and preferably concentric with the wall —14— and contracted peripherally at an intermediate point toward the upper end of the wall —14— to form a circumferential concavity through which a series of spaced aligned openings 24 extend, constituting passage ways for a series of wicks —20—.

In other words a series of separated wick receiving spaces are formed exterior of the wall —14— and utilizing said wall as the interior surface of said wick receiving spaces,
the concavity of the wall —19— permitting the projection of said wicks beyond the adjacent enclosing portions of said wall for contact with the yarn or thread as herein-5 after described.

When the cap —18— is removed, suitable wicks may be slidably positioned in respective wick receiving spaces, preferably extending to or adjacent the lower end of the wall —14— and when the cap —18— is secured to said wall —14—, it acts to confine the wicks in desired position. Communication between the interior of the element —10— and each wick receiving space is afforded by an opening or orifice —21— for each space and formed in the lower edge of the wall —14— so as to feed dyeing fluid to the wicks and each orifice is preferably provided with a coacting valve —22— having its stem adjustably engaged with a removable nut —29— mounted in the wall —19—. The wick —20— may, as shown, have its lower end positioned between the valve and the valve seat about the orifice —21— so that compression of the wick itself will prevent flow of the fluid or as shown in Figure —2— the wick may rest upon the upper end of the valve stem and the valve itself be directly utilized to control the flow of the dye.

The interior of the element —10— may be divided into any suitable number of chambers and these chambers may contain dye of the same color or dyes of different colors as desired and the number of wicks may be predetermined to effect proper distribution of color. Any orifice —21— may be completely closed and the wick coacting with that orifice withdrawn from the element so that any particular number of wicks desired may be utilized.

By driving the element preferably in the same direction as and at a speed properly correlated with the speed of the yarn, mere dots spaced apart a distance equal to the spacing of the wicks may be formed upon the yarn or by driving the element at a less or greater speed, a relative movement of the yarn across each wick will be effected whereby dye or stain will be applied to the yarn in elongated lengths, the length of the dye or stain produced by each wick being determined by the relative speed of the parts and therefore wholly under the control of the operator.

Although I have shown and described a particular construction and method of operation of the same as illustrative of my invention, I do not desire to limit myself to the same as various changes and modifications may be made, all within the scope of the appended claims.

What I claim is:

1. In a dyeing machine, a rotary element, a wick projecting from the surface of said element, means for supplying dye to the wick, means for moving a thread across the periphery of said element in contact with said wick, and means for rapidly and continuously rotating the element during the entire period that the thread is in contact with the wick.

2. In a dyeing machine, a rotary element, a wick projecting from the surface of said element, means for supplying dye to the wick, means for rapidly moving the thread across the periphery of said element in contact with said wick, and means for rotating the element during the entire period that the thread is in contact with the wick.

3. In a dyeing machine, a rotary element, a wick projecting from the surface of said element, means for supplying dye to the wick, means for rapidly moving thread across the periphery of said element in contact with said wick, means for rapidly and continuously rotating the element during the entire period that the thread is in contact with the wick, and means for regulating the supply of dye to the wick.

4. In a dyeing machine, a rotary element, a plurality of wicks projecting from the surface of said element, means for supplying dye to the wicks, means for rapidly moving thread across the periphery of said element in successive contact with said wicks respectively, and means for rapidly and continuously rotating the element during the entire period the thread is in contact with the wicks.

5. In a dyeing machine, an element having a plurality of dye containing chambers, separate wicks projecting from the surface of said element and in communication with respective chambers, means for rapidly moving thread across the periphery of said element in successive contact with respective wicks, and means for rotating the element during the entire period that the thread is in contact with the wicks.

In witness whereof I have hereunto set my hand this 17th day of December, 1918.

EUGENE A. THOMPSON.

Witnesses:

H. E. CHASE,

GERTRUDE O'BRIEN.