

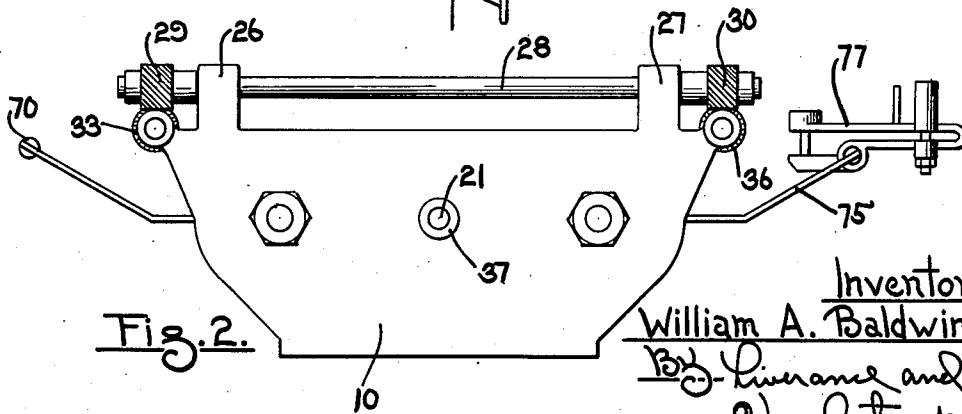
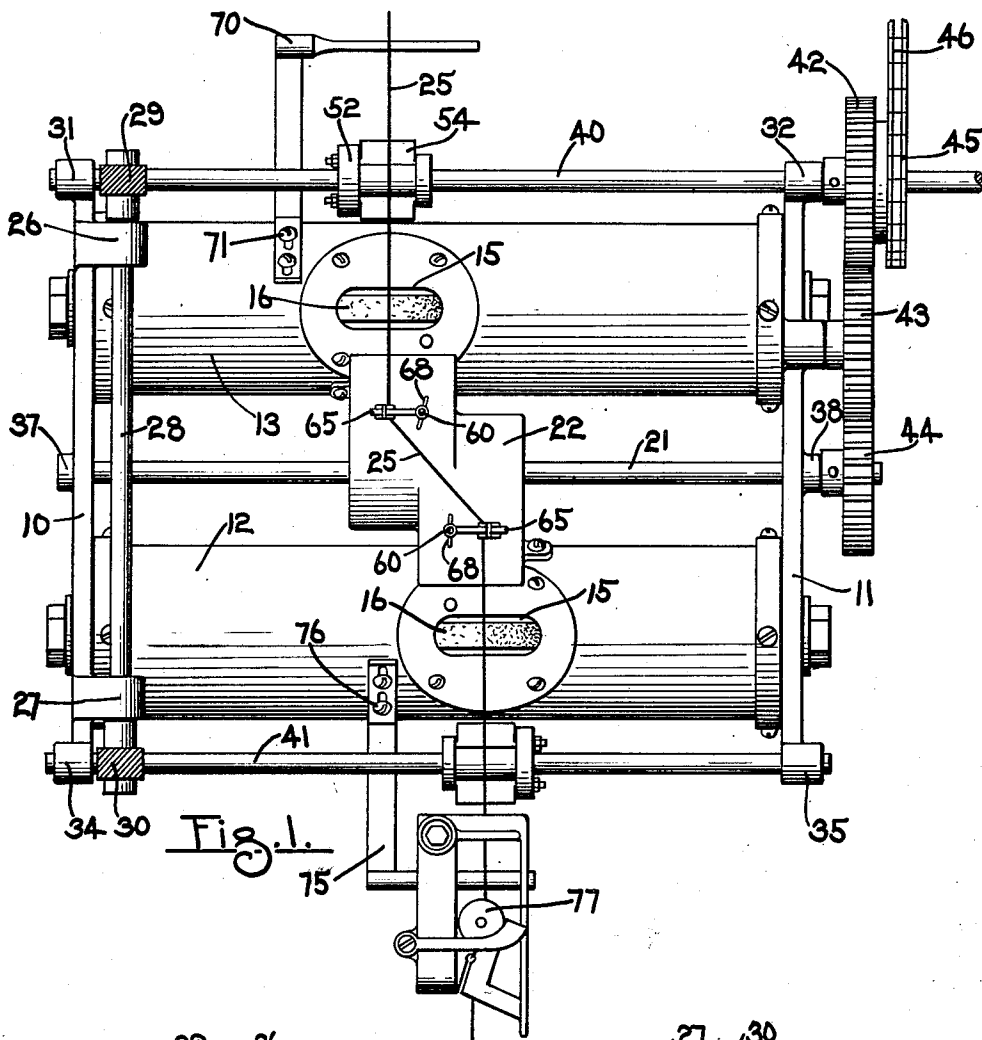
May 30, 1939.

W. A. BALDWIN
DYEING MACHINE

2,160,300

Filed May 27, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

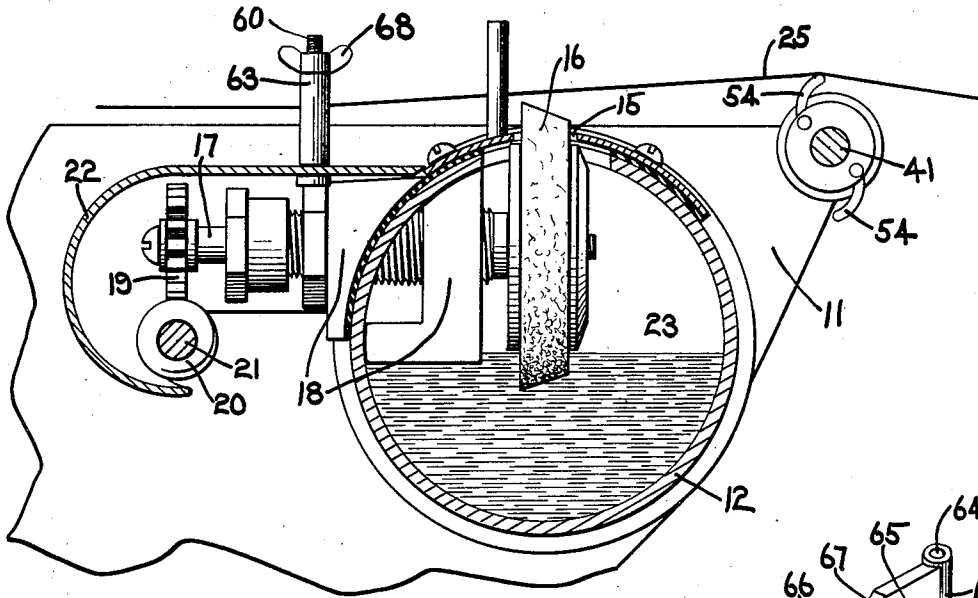


Fig. 3.

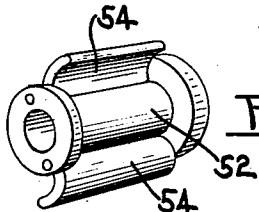


Fig. 5.

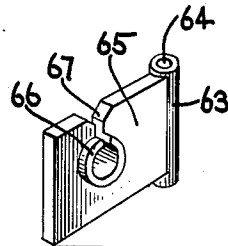


Fig. 7.

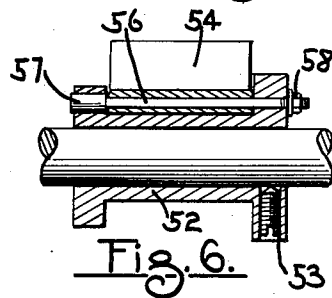


Fig. 6.

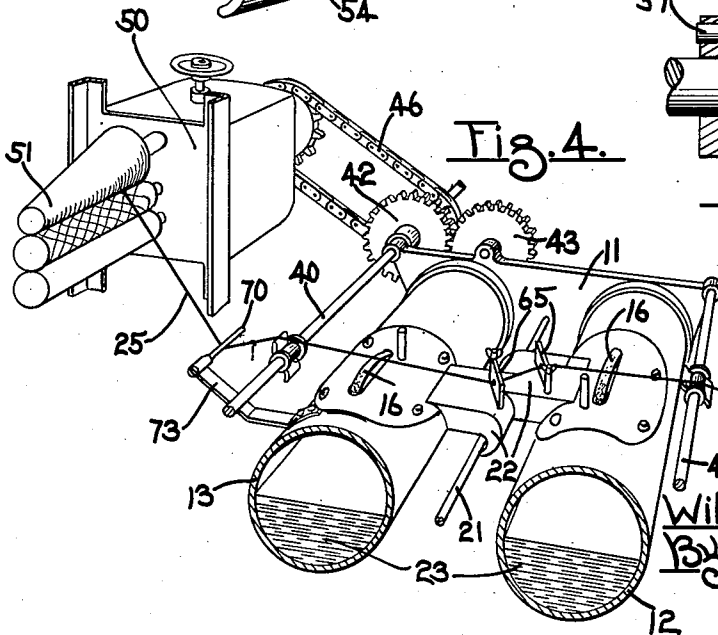


Fig. 4.

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UNITED STATES PATENT OFFICE

2,160,300

DYEING MACHINE

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Application May 27, 1936, Serial No. 82,059

11 Claims. (Cl. 68—203)

This invention relates to a dyeing machine.

Briefly described, my invention involves two sources of dye having dye applying means together with intermediate means for varying the path of the yarn which is being dyed and speed regulating adjustable mechanism for intermittently lifting the yarn from the respective dyeing applicators.

Probably the primary feature of my invention may be said to reside in the mechanism which is capable of coloring a strand of yarn in many different patterns. For example, the yarn may be alternately colored in two different colors, these colors appearing in either equal or different lengths. Or the colors may be alternately disposed, as just explained, with more or less of the original yarn, usually white, appearing between every other color or every sequence of colors as desired. Additionally, there are many other color combinations which may be created by use of my novel mechanical arrangement.

Further advantages will become apparent as the description proceeds.

In the drawings:

Fig. 1 is a plan view of a machine constructed in accordance with my invention.

Fig. 2 is an end view of Fig. 1.

Fig. 3 is an enlarged fragmentary vertical cross sectional view illustrating one of the dye reservoirs and the means for raising the yarn.

Fig. 4 is a perspective view of my mechanism.

Fig. 5 is a perspective view of the yarn raising means.

Fig. 6 is a longitudinal sectional view through Fig. 5.

Fig. 7 is a perspective view illustrating one of the adjustable yarn eyelet members.

Like numerals refer to like parts throughout the several views.

Referring particularly to Figs. 1 and 2, numerals 10 and 11 indicate the end or mounting plates. These plates carry spaced reservoirs 12 and 13 between them. Each reservoir has an opening 15 therein through which an absorbent disk 16 extends, this disk preferably being of felt and being shaped as shown in Fig. 3. Each disk 16 is detachably mounted upon a shaft 17, carried by the bearing member 18. The shaft 17 has a worm gear 19 which is driven by the worm 20 on a shaft 21. The shaft 21 is revolvably mounted in bearings 37 and 38 on the end plates 10 and 11, respectively.

A suitable housing 22, see Figs. 1 and 4, conceals the driving mechanism just described. It is to be understood that the shaft 21 drives both disks 16 through similar driving mechanism. Each of the disks 16 rotates and dips into the fluid dye 23, see Fig. 3, and carries it upwardly whereby the yarn may contact thereagainst.

The end mounting plate 10 carries extensions

26 and 27 which act as bearings for a shaft 28. The shaft 28 carries beveled gears 29 and 30. The end plate 10 also has a bearing member 31 which acts as one end bearing for the shaft 40, the other end bearing 32 being formed on the end plate 11, see Fig. 1. The shaft 40 carries a beveled gear 33 which meshes with the beveled gear 29 and thus the shaft 40 drives the shaft 28.

A shaft 41 is located in a bearing 34 on the end plate 10 and a bearing 35 on the end plate 11. This shaft 41 carries a beveled gear 36 which meshes with the beveled gear 30 and thus the shaft 41 is rotated. Preferably the construction is such as to cause the shafts 40 and 41 to be driven at the same speed.

The shaft 40 carries a gear 42 which meshes with an idler gear 43 to drive a gear 44 attached to the shaft 21.

The shaft 40 carries a sprocket wheel which drives the speed mechanism 50 whereby the yarn carrying spindle 51 is caused to rotate at an adjustable but constant speed thus pulling the yarn 25 through the machine at a constant speed. The shaft 40 is driven by any suitable means.

Each of the shafts 40 and 41 carries a double vaned construction which consists of a spool-like member 52 circumferentially adjustably attached by means of a screw 53 onto its respective shaft, see Fig. 6. Curved vanes 54 are pivoted upon the pin member 56, having the enlarged head 57, and a locking nut 58. It will be understood that adjustment of the nut 58 causes movement of the head 57 either against or away from the vane 54 thus locking it in the desired position or else loosening it for movement to the desired position.

As shown in Figs. 1 and 4, studs 60 extend upwardly from the casings 22 and pass through openings 64 in the journals 63 of eyelet members 65. An eyelet 66, having a tapered entering slot 67, is formed as shown in Fig. 7. Winged nuts 68 thread onto the studs 60 and contact the eyelet members 65 to hold them in their adjusted position.

As is shown in Figs. 1 and 2, my construction is provided with bracket means 70, adjustably attached at 71, to control the angle of the yarn entering the machine.

As is shown in Fig. 1 a bracket member 75 is adjustably connected at 76 onto the reservoir 12. The bracket 75 adjustably carries mechanism 77, this mechanism serving to tension the yarn 25 and to cause it to properly pass through the dyeing mechanism.

The operation of my device is easily understood. The conical spindle member 51 pulls the yarn 25 through the machine at a constant rate of speed.

The shaft 40, driven by the prime mover, drives the gear mechanism 50 through the sprocket

chain 46 and its associated gear wheels and likewise drives shaft 41 through the cross shaft 28 and its associated gears. Thus, the shafts 40 and 41 rotate at a constant speed.

5 The center shaft 21 is driven through the gears 42, 43 and 44 and thus the felt washers 16 are rotated to carry the dye upwardly whereby contact between the yarn 25 and the felts 16 cause dyeing to occur.

10 The vanes 54 are angularly adjusted to the desired position and the spools 52 are circumferentially adjusted upon their respective shafts. The vanes 54 contact the yarn and raise it from contact with the associated felt 16 whereby the dyeing of the yarn is interrupted.

15 The adjustable vane construction, located on the shaft 40, see Fig. 4 of the drawings, raises the yarn 25 from the felt disc 16 at certain periods whereby the yarn is maintained free from dye at certain regular spaces. Similarly, the vane mechanism of the shaft 41 raises the yarn 25 from the other felt disc 16. In order to properly synchronize the application of dye on the yarn 25 the eye members 65 are turned and locked in any desired adjusted positions, see Fig. 1, whereby the dye applied from one felt will be in a properly spaced linear relationship on the yarn with respect to the dye applied from the other felt.

30 Furthermore, the double vaned lifting mechanism serves to permit the yarn to be raised practically continuously, if desired, whereby the yarn may have extremely short dyed portions. It will be apparent that many different dyeing combinations may be had.

35 The shaft 21 drives both of the felt discs 16 similarly and thus a proportioned amount of dye is lifted from each of the reservoirs.

40 The same driving means which drives the shaft 21 also drives the synchronized lifting means. Furthermore, the two sets of vaned lifting means are timed or synchronized with respect to the speed of the conical roller 51 inasmuch as the length of the yarn dyed is a function of both the speed of the yarn's movement and the rota-

45 tive speed of the vaned lifting means. Having thus revealed this invention, I claim as new and desire to secure the following combinations and elements, or equivalents thereof, by Letters Patent of the United States.

50 I claim:

1. In a construction of the class described, a first reservoir containing dye, dye applying means associated therewith, a second reservoir contain-

55 ing dye, additional dye applying means associated therewith, means for mounting the two reservoirs in spaced relationship, means for drawing the material which is to be dyed successively across the said dye applying means, means for intermit-

60 tently and automatically raising the said material from one of said dye applying means, additional means for intermittently and automatically raising the said material from said other of said dye applying means and means for varying

65 the path of travel of the material being dyed intermediately the two reservoirs.

2. In combination with a dyeing machine having spaced dye applying means, said means adapted to apply dye to the material intermit-

70 tently in predetermined cycles as it is drawn past said means, means to vary the length of material moving between said spaced dye applying means.

3. In combination with a dyeing machine hav-

ing spaced dye applying means, said means adapted to apply dye to the material as it is drawn past said means, means for applying the dye intermittently in predetermined cycles at each of the spaced dye applying means and means to vary the length of material passing between said spaced dye applying means.

4. In combination with a dyeing machine having spaced dye applying means, means for rendering each of said dye applying means intermit-

10 tently inoperative, said means being driven synchronously, means for varying the length of material between said spaced dye applying means whereby the intermittent applications of dye to the material by one of the dye applying means

15 may be moved relative to the applications of dye by the other dye applying means.

5. In combination two spaced dye applicators to treat yarn, guiding means situated between said applicators, said guiding means including a plurality of elements rotatable about one end thereof having eyelets therein through which said yarn passes and adapted to vary the length of material between said applicators.

6. A device for dyeing yarn comprising in combination a yarn winder, means to operate said winder at a constant speed or a constant pre-

25 determined cycle of speeds, a plurality of spaced apart dye applicators operable by and synchronously with said means to operate said winder, means to intermittently render said dye applicators inoperative, and means to vary the length of yarn between each of said applicators.

7. A device for dyeing yarn comprising in combination the elements defined in claim 6, said last named means including a pair of elements rotatable about one end thereof and having eyelets therein through which said yarn passes, situated between said applicators.

8. A machine for dyeing yarn comprising two spaced apart dye applicators, means for continuously passing a strand of yarn past both applicators, independent contact means for each applicator acting to intermittently cause contact of said yarn with each respective applicator, means for synchronously actuating said respective contact means and means for varying the phase of such synchronism.

9. The elements in combination defined in claim 8 combined with means for varying the length of the path of travel of the yarn between said applicators.

10. A yarn dyeing machine comprising a dye applicator, means for controlling the intermittent contact of the yarn with said dye applicator comprising a rotating member having a yarn contacting edge rotating in a circular path, means for continuously drawing yarn past said contacting member and said applicator in a path normally intercepting the circular path of travel of said contacting edge as a chord and means for varying the length of chord intercepting said circular path.

11. A yarn dyeing machine comprising, two spaced apart dye applicators, means for continuously drawing a strand of yarn past both dye applicators, separate means for intermittently forcing said yarn into contact with said dye applicators whereby each dye applicator intermittently applies dye to intermittent lengths of said yarn, and means adjustable while the machine is in operation for registering the portions of yarn dyed by the respective applicators.

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