

J. C. EVENDEN.
DYEING MACHINE.
APPLICATION FILED DEC. 4, 1908.

1,065,036.

Patented June 17, 1913.

2 SHEETS—SHEET 1.

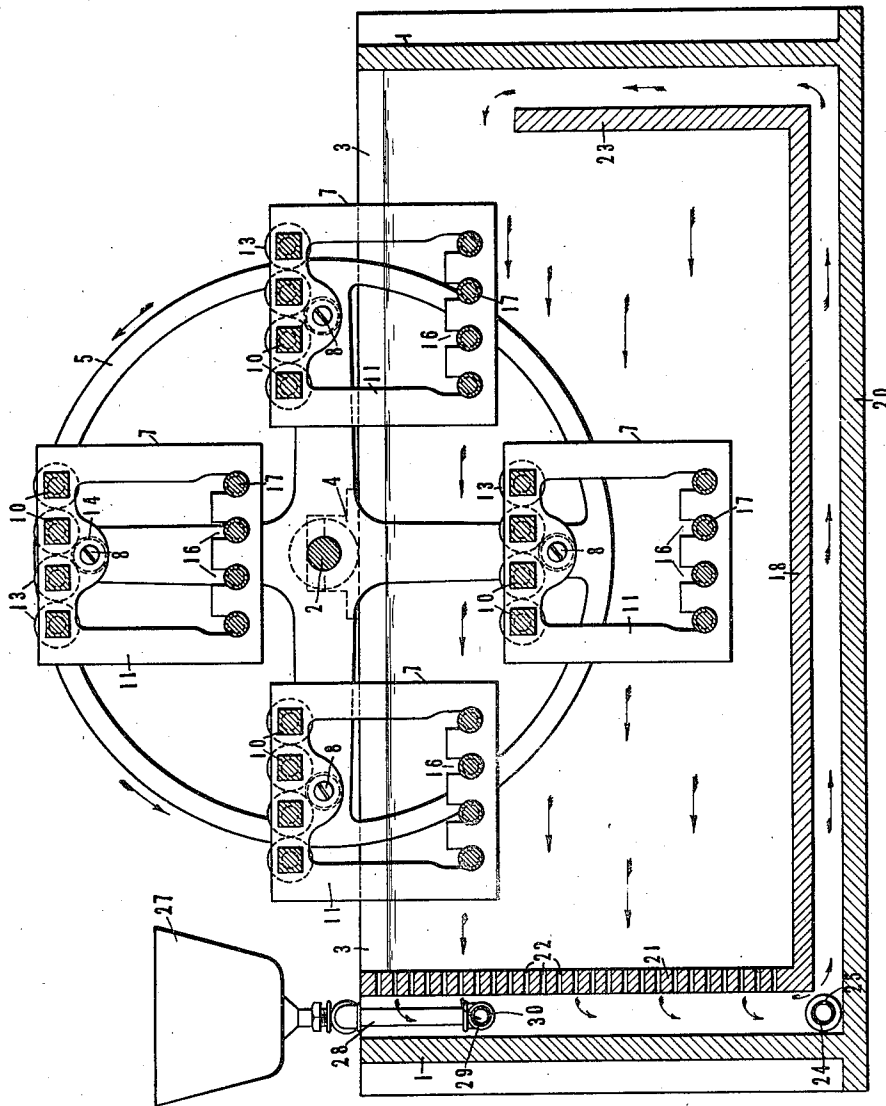


FIG. 1

WITNESSES
Morris Perry
Royal W. France.

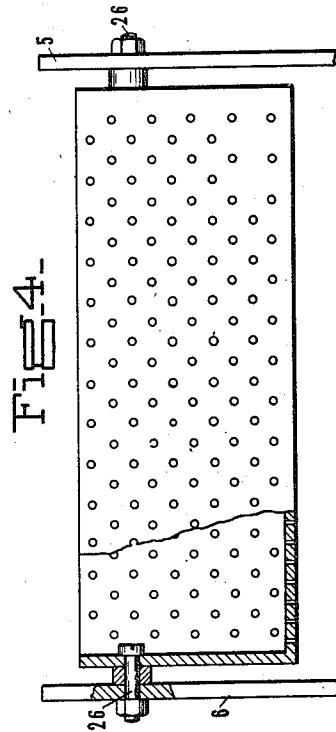
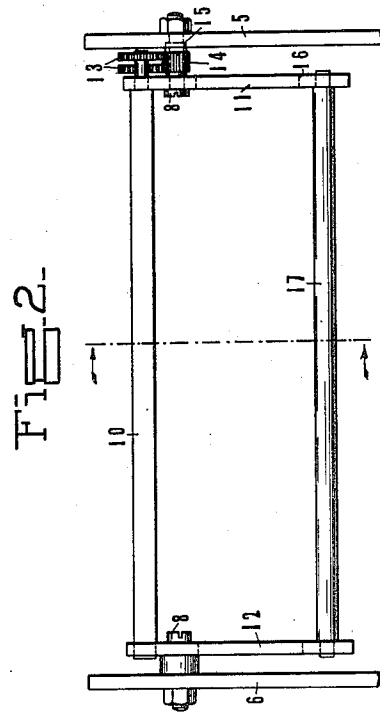
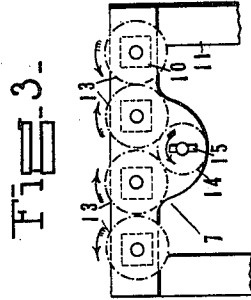
INVENTOR
J. C. Evenden
BY
Wm. W. W. W. W.
ATTORNEYS

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2 SHEETS-SHEET 2.



WITNESSES
Novins Perry
Royal W. France.

INVENTOR
J. C. Evenden
BY
Duell, Warfield & Duell
ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN C. EVENDEN, OF AMSTERDAM, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO KLAUDER-WELDON DYEING MACHINE COMPANY, OF AMSTERDAM, NEW YORK,
A CORPORATION OF NEW YORK.

DYEING-MACHINE.

1,065,036.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed December 4, 1908. Serial No. 465,903.

To all whom it may concern:

Be it known that I, JOHN C. EVENDEN, a citizen of the United States, residing at Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Dyeing-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for dyeing, scouring, bleaching, or otherwise treating fibrous material, and it more particularly relates to an improvement in apparatus of this character adapted for dyeing skein yarn composed of various materials.

One of the objects of the invention is to provide apparatus such that the yarn will be uniformly saturated or impregnated with the dye.

Another object is to provide, in combination with a rotary carrier for the material to be dyed, new and improved means whereby the dye liquor may be caused to circulate through the dye tank in a direction opposite to the direction of movement of said material.

A further object is to provide new and improved means for moving the skeins of yarn upon their respective carriers whereby all portions of the skeins are uniformly subjected to the action of the dye liquor.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein are illustrated two of various possible embodiments of the invention, Figure 1 is a vertical sectional view taken longitudinally of the machine; Fig. 2 is a view in elevation of a portion of the rotary carrier for the material to be dyed, showing the means for driving the yarn sticks; Fig. 3 is an end view of a portion of the frame for carrying the material to be treated and showing the arrangement of the gears by means of which the yarn sticks are rotated; and Fig.

4 is a view in elevation partly broken away showing a different embodiment of carrier for the material to be treated.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings 1 denotes a tank for holding the dye liquor, said tank being preferably formed rectangular as shown, and being open at its upper portion. A shaft 2 extends transversely of the tank at its upper portion intermediate its ends, and is supported upon the side walls 3 of the tank in journal box 4. Wheels 5 and 6 are mounted upon opposite ends of shaft 2 adjacent the side walls of the tank within the same, the lower portion of the wheels being immersed in the dye liquor as shown. Referring to Figs. 1 to 3 inclusive, the numeral 7 designates a plurality of frames, said frames being interposed between wheels 5 and 6 and journaled at their upper portions upon stud screws 8 suitably fastened in the wheels, the construction being such that the frames hang upon their journals and remain at all times in vertical position as shown in Fig. 1 of the drawings. It is to be understood, of course, that the frames 7 when wheels 5 and 6 are rotated will be first dipped vertically into the dye liquor, then moved sidewise through the same and withdrawn from the liquor in a vertical direction.

Journaled in the upper portion of each of frames 7 in the present instance are a plurality of preferably square yarn sticks 10, said sticks extending lengthwise of the frames and being supported in the end walls 11 and 12 thereof. Each of these sticks at one end is operatively connected with a gear wheel 13 as clearly shown in Figs. 2 and 3, the several gear wheels preferably intermeshing as shown so as to rotate simultaneously in the directions indicated by the arrows in Fig. 3. The several gear wheels 13 and their associated sticks are driven by a gear wheel 14 which is fixed upon the wheel 5 as by means of a squared portion 15 which enters a similarly shaped recess in the flange of the wheel. Gear wheel 14 in the present instance intermeshes with the gear wheels 13. By reason of this construction it will be seen that when the wheels 5 and 6 are rotated the several gear wheels will be

similarly rotated, since the frames rotate upon their journals and always remain in a vertical position. The lower portion of each of said frames is provided with slots as at 16, round sticks 17 being loosely positioned in the slots, the number of round sticks corresponding to the number of squared sticks journaled in the upper portion of the frame. Each pair of round and square sticks is adapted to support a plurality of skeins of yarn, and it will be understood that the squared sticks as well as the round ones may be conveniently removed from their supports by moving the same longitudinally to the left, in Fig. 2, for example, when it is desired to position the skeins in operative position with respect to the sticks or remove them, as when the dyeing operation has been completed.

In order to maintain a circulation of the dye liquor through the tank in a direction opposite to that in which the material to be treated is moved therethrough, I provide a false structure within the dye tank comprising a floor 18 in the bottom portion of the tank, said floor being spaced from the bottom wall 20 and terminating short of the end walls of the tank as shown. Extending upward from one end of this floor through the dye liquor and transversely of the tank is a partition 21 which is provided with a plurality of perforations 22 through which the dye liquor may circulate as indicated by the arrows. Upon the opposite end of the floor 18 is provided an imperforate partition 23, said partition extending transversely of the tank and upward in the dye liquor, but terminating short of the upper surface thereof. A steam pipe 24 extends transversely of the tank adjacent the junction of floor 18 with the perforated partition 21, said steam pipe being provided with jets 25 which deliver steam beneath the false floor 18 in the direction indicated by the arrows.

Having thus described the construction of this embodiment of my invention the operation thereof may now be understood. When shaft 2 is rotated, thereby rotating wheels 5 and 6 in the direction indicated by the arrows, the frames 7 are progressively dipped in the dye liquor in a vertical direction, moved sidewise therein and then withdrawn from the dye liquor vertically, as has been hereinbefore explained, gear wheels 14 rotating the square sticks 10 simultaneously with the rotative movement of the rotary carrier. The jets in the steam pipe 24 will cause the hotter dye liquor to flow in the direction of the escaping steam underneath the floor 18, thence over the end of the partition 23 and through the tank as indicated by the arrows, the colder liquor being drawn through the perforated partition 21. It will, therefore, be seen that the continuous circu-

lation of the dye liquor is maintained in the tank and that the direction of circulation thereof is opposite to the direction of the movement of the carriers for the material which is being treated.

In Fig. 4 I have illustrated a different embodiment of carrier for the material to be treated, said carrier comprising a perforated box which may be interposed between the wheels 5 and 6 and suspended therefrom upon stud screws 26. These boxes may be similarly carried through the dye liquor when the supporting wheels are rotated.

A bowl 27 is suitably supported above the tank and is connected therewith by means of a pipe 28 extending downwardly between partition 21 and the end of the tank. From this pipe leads a pipe 29 which extends transversely across the tank and is provided with a plurality of downwardly directed perforations 30. The color from the bowl 27 flows by gravity through pipe 28 into pipe 29, from which it is drawn by suction produced by the circulation previously described. This insures that the dye shall be thoroughly mixed and dissolved in the liquid before the same is passed through the material which is being treated.

It will accordingly be seen that I have provided a construction well adapted to attain among others all the ends and objects above pointed out in an extremely simple, yet efficient, manner. It will be obvious that the various relative movements which take place between the material to be treated and the dye liquor will result in an even and thorough impregnation of said material with the dye. If desired a suitable cover may be positioned upon the tank.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. In a dyeing apparatus the combination with a tank of means adapted to circulate a liquor within said tank in a closed path from one side to another, means adapted to move an article laterally in said tank against the flow of said liquor comprising a shaft extending transversely of and above the

tank and suitably journaled upon the side walls thereof, a structure mounted upon said shaft comprising spaced rotary carriers which extend downwardly into the liquor, 5 frames carried by said carriers and interposed between the same, the construction being such that said frames will be progressively dipped into the liquor and withdrawn therefrom during the rotation of said carriers, a plurality of sticks supported in the 10 upper portion of each of said frames, intermeshing gear wheels operatively associated with said sticks for rotating the same, and a gear wheel fixed upon one of the carriers 15 and meshing with said first-mentioned gear wheels to drive the same simultaneously with the rotation of said carriers.

2. In a dyeing apparatus, the combination with a tank adapted to hold a dye liquor, of 20 a rotary carrier positioned above said tank so that its periphery passes through said dye liquor for carrying the material to be dyed into and out of the tank, and means within said tank for compelling the dye liquor contained therein to circulate in a closed path 25 from one side to another opposite in direction to the movement of the material to be dyed as it passes laterally through said tank on said rotary carrier.

3. In a dyeing apparatus, the combination with a tank adapted to hold the dye liquor, of a rotary carrier for the material to be 30 dyed operatively positioned with respect to the tank and adapted to immerse said material in the dye liquor during the rotation thereof, and means for compelling a circulation 35 of the dye liquor, comprising a false floor in the lower portion, a perforated partition extending transversely of the tank 40 and spaced from the end wall thereof adjacent the end of said false floor, an imperforate partition extending transversely of the tank at the opposite end thereof, and spaced from the end wall of the tank, and 45 means for delivering the steam into the tank beneath said false floor in such direction as will cause the dye liquor to flow between said floor and the bottom wall of the tank, thence upward and over said imperforate

partition, thence longitudinally of the tank 50 in a direction opposite to that of the movement of said material through the tank whence it flows through said perforated partition.

4. In a dyeing apparatus, the combination 55 with a tank adapted to hold the dye liquor, of a rotary carrier for the material to be dyed supported above the tank and partly immersed in the dye liquor so that when said carrier is rotated the material to be 60 dyed will be progressively immersed and withdrawn from the liquor, and means for compelling a circulation of the dye liquor through said tank, comprising a false floor arranged in the lower portion of the tank 65 and spaced from the bottom wall thereof, said floor terminating short of the end walls of the tank, a transverse perforated partition extending upwardly through the tank from one end of said floor and an imperforate 70 partition extending transversely of the tank at the opposite end of said floor, said partition terminating below the surface of the liquor, and a steam pipe extending transversely of the tank at one end thereof and having jets 75 for delivering the steam beneath said floor, the direction of said jets being such that the dye liquor is compelled to flow first between said floor to the bottom wall of said tank, thence upward and over said imperforate 80 partition, thence longitudinally of the tank in a direction opposite to the movement of the material to be treated, thence through said perforated partition, whence it returns to be again circulated through said tank. 85

5. In a dyeing apparatus, in combination a tank, means adapted to circulate a liquid within said tank in a closed path from one side to another and means adapted to move an article laterally in said tank against the 90 flow of said liquid.

In testimony whereof I affix my signature, in the presence of two witnesses.

JOHN C. EVENDEN.

Witnesses:

CHARLES FROHLICH,
HARRY SHERBURNE.