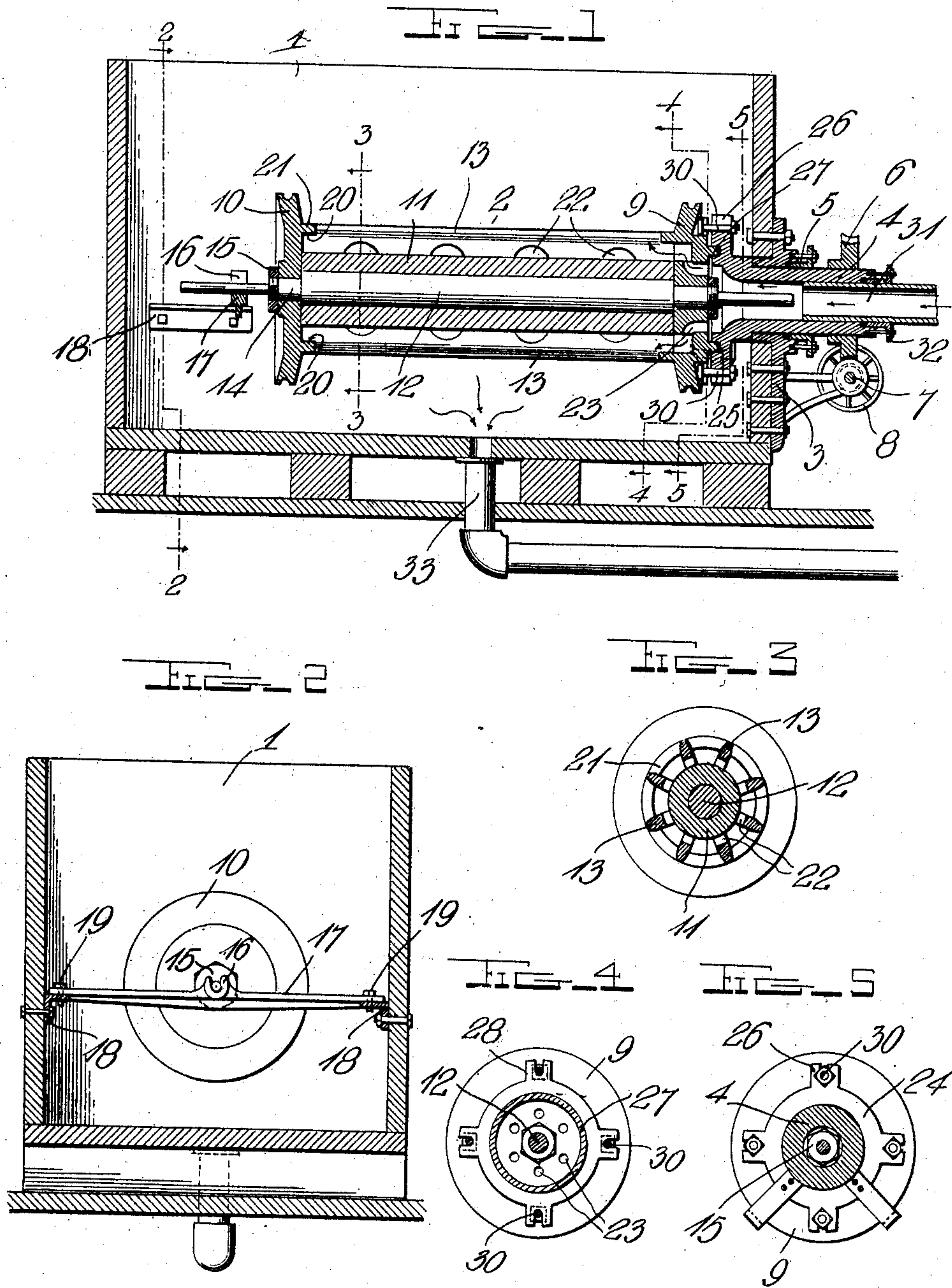


F. M. MORTON.
 RIBBED REVOLVING VACUUM BEAM FOR DYEING MACHINES.
 APPLICATION FILED AUG. 1, 1910.

975,270.

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Witnesses

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UNITED STATES PATENT OFFICE.

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RIBBED REVOLVING VACUUM-BEAM FOR DYEING-MACHINES.

975,270.

Specification of Letters Patent.

Patented Nov. 8, 1910.

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To all whom it may concern:

Be it known that I, FRANK M. MORTON, a citizen of the United States, residing at Phoenix, in the county of Lee and State of Alabama, have invented certain new and useful Improvements in Ribbed Revolving Vacuum-Beams for Dyeing-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in yarn dyeing machines and more particularly to a ribbed or fluted revolving vacuum beam on which the yarn is wound so that the dye-liquor may be forced through the yarn in an inward or outward direction.

One object of the invention is to provide a beam of this character which will be simple, practical and inexpensive in construction and which will permit the yarn to be effectively and uniformly dyed.

Another object of the invention is to provide improved means for detachably mounting the beam in the tank or receptacle of the dyeing machine.

With the above and other objects in view the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section through a dyeing machine or apparatus embodying my invention; and Figs. 2, 3, 4 and 5 are detail sectional views taken respectively on lines 2—2, 3—3, 4—4, and 5—5 of Fig. 1.

Referring more particularly to the drawings, 1 denotes a suitable receptacle such as a tub or tank adapted to contain the dye-liquor and in which my improved ribbed revolving vacuum beam 2 is removably mounted. On one wall of the tank 1 is suitably secured a plate 3 having a bearing for a tubular trunnion 4, to the inner end of which latter is detachably connected one end of the beam or drum 2. A stuffing box 5 is provided on the bearing to prevent the escape of the dye-liquor around the trunnion. Any means may be provided for rotating the trunnion but I preferably employ a worm gear 6 which is fixed to the projecting end of

the tank and which meshes with the worm on a transverse shaft 7 journaled in bearing brackets projecting from the plate 3 and carrying a belt wheel or pulley 8. The beam 2 consists of two circular heads 9 and 10, a hollow cylindrical body member or sleeve 11, an inner core or shaft 12 arranged within the sleeve 11 and an annular series of radially projecting and longitudinally extending ribs, slats or bars 13. The shaft 12 has an enlarged central portion arranged within the sleeve 11 and it also has reduced portions which extend through central openings in the heads 9 and 10 and are provided with screw threads to receive nuts 15, which latter retain the heads 9 and 10 on the shaft and against the ends of the sleeve 11. The extremities of the shaft 12 are reduced as shown in Fig. 1, one extension projecting into the tubular trunnion 4 and the other being removably arranged in the bearing recess 16 provided at the center of a cross bar 17 slidably and adjustably supported on angle brackets 18 secured to the opposite walls of the tank 1. Pins or bolts 19 are provided for retaining the ends of the cross bar 17 in adjusted position. The annular series of slats or bars 13 are secured in position at intervals around the outer surface of the sleeve 11. By notching the outer corners of said bars as shown at 20 and engaging these notches 20 with annular flanges 21 formed on the opposing inner faces of the heads 9 and 10, the bars or slats 13 make the beam fluted or ribbed so that when the yarn is wound upon it, spaces will be formed between the adjacent bars 13, the yarn and the sleeve 11. To permit the dye-liquor to circulate through these spaces the bottom or inner edges of the bars 13 are notched as shown at 22. The head 10 is solid or closed but the head 9 is formed with openings or passage ways 23 so that the dye-liquor may circulate through the spaces in the beam and the bore of the trunnion 4.

The detachable connection between the head 9 of the beam and the trunnion 4 is effected by forming on the inner end of said trunnion and circular flange 24, having in its inner face an annular packing groove 25 and around its outer edge notched lugs 26. The head 9 is formed on its outer face with an annular flange 27 to enter the groove 25 and prevent the escape of the dye-liquor

between said head and the flange 24 on the trunnion. The outer face of the head 9 is also formed with notched and recessed lugs 28 adapted to receive the heads of bolts or similar fastenings 30, which latter also engage the notches in the lugs 26 on the flange 24 of the trunnion and thereby detachably connect the head 9 to the trunnion as will be readily understood on reference to Figs. 1, 4 and 5.

Any means may be provided for causing the circulation of the dye-liquor through the trunnion 4, the openings 23 in the head 9, the spaces in the beam 2 and the yarn wound on the beam, and also causing such circulation in the reverse direction; as illustrated, however, a combined inlet and discharge pipe 31 projects into the outer end of the trunnion 4 and through a stuffing box 32 on the latter, and a second combined discharge and inlet pipe 33 communicates with the bottom of the tank 1. These pipes 31 and 33 are, of course, connected to a suitable force pump and valves and connections for reversing the direction of the flow of the dye-liquor through them.

From the foregoing it will be seen that when the beam is placed in the machine in the tank with the yarn wound upon it and the circulation of the dye-liquor is started, when this liquor moves in the direction of the arrows in Fig. 1, it will be forced outwardly through the yarn as the beam is rotated. When the direction of movement of the liquor is reversed it will be sucked through the yarn and into and through the trunnion 4.

34 denotes annular supporting arms arranged on flange 24 to support the head 9.

While I have shown and described in detail the preferred embodiment of my invention, I wish it understood that I do not limit

myself to the precise construction set forth since changes in the form, proportion and arrangement of parts and in the details of construction may be resorted to within the spirit and scope of the claimed invention.

What I claim is:

1. The combination of a tank for dye-liquor, a tubular trunnion journaled in one wall of the tank, said trunnion having at its inner end a radially projecting flange formed with an annular groove and notches, a ribbed beam to support the yarn and provided at one end with a head having dye-liquor openings, and an annular flange adapted to enter said groove in the flange of the trunnion, said head also having recesses, fastenings engaged with said recesses and notches in the flange of the trunnion whereby the beam is detachably secured to the trunnion, means for rotating said trunnion and means whereby the dye-liquor may circulate through the tank, the beam and the trunnion.

2. In a dyeing machine, a beam composed of a shaft, a sleeve arranged thereon, heads secured to the shaft at the ends of said sleeve, and provided on their opposing faces with inwardly extending flanges, one of said heads being formed with openings to permit of the passage of the liquor, and an annular series of longitudinally extending bars having notched ends to engage the flanges on said heads; the inner edges of said bars being engaged with said sleeve and formed with transverse notches.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK M. MORTON.

Witnesses:

J. S. KIMBROUGH,
GEO. A. HAYS.