J. RICHARDSON & J. F. NEEF.

DYEING MACHINE.

APPLICATION FILED DEC. 7, 1909.

957,801.

Patented May 10, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

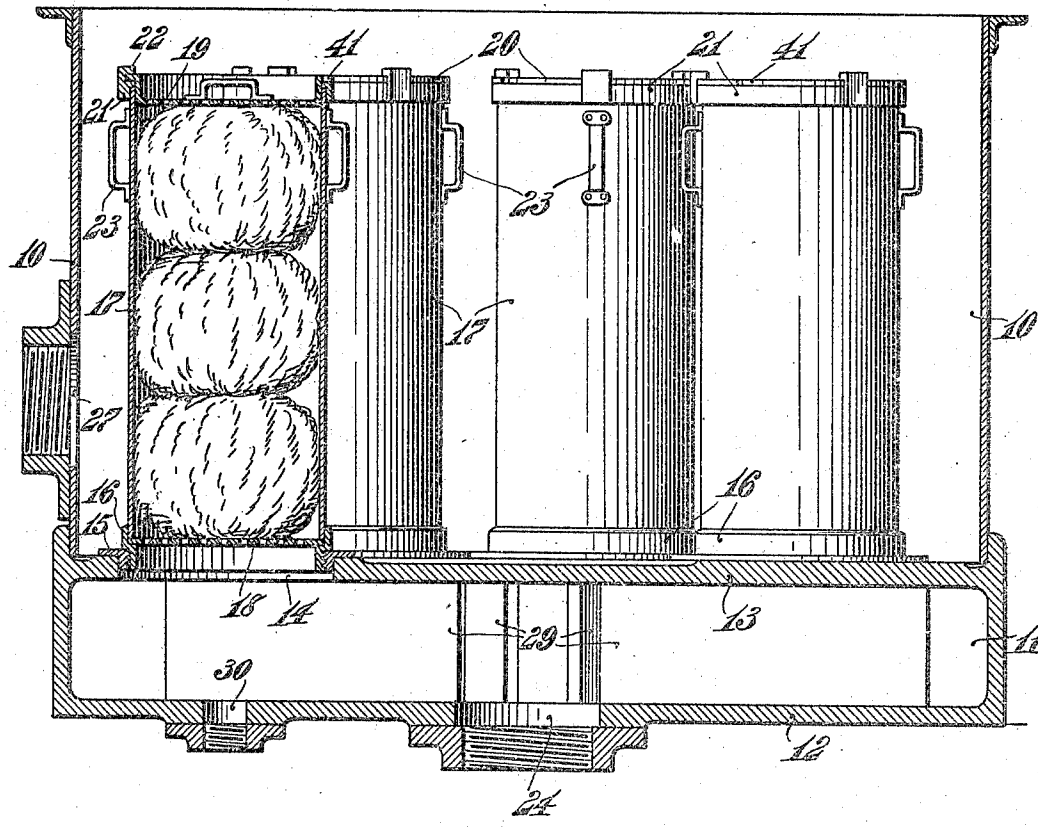
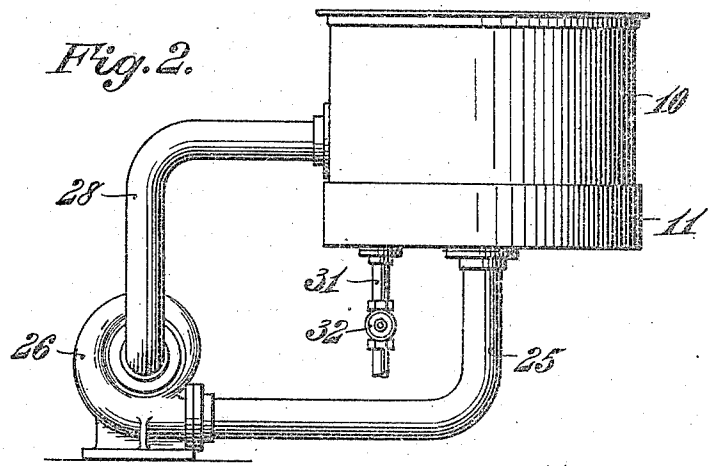


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

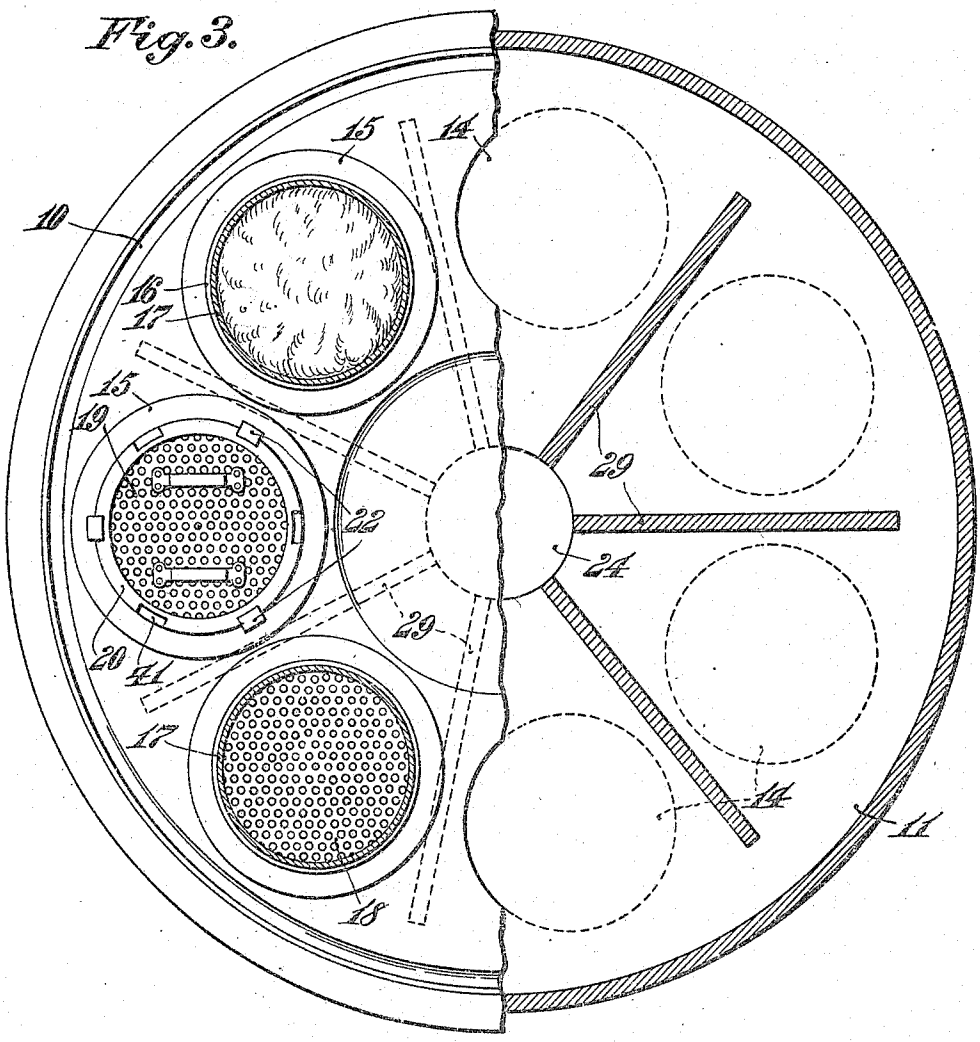
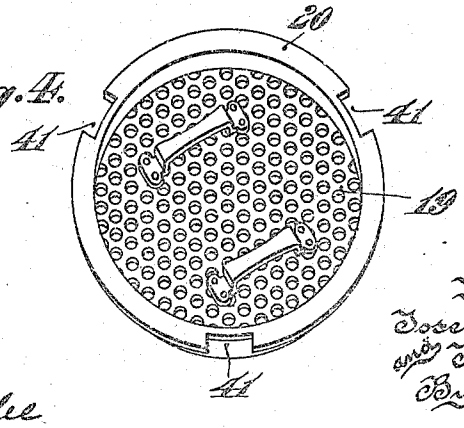


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

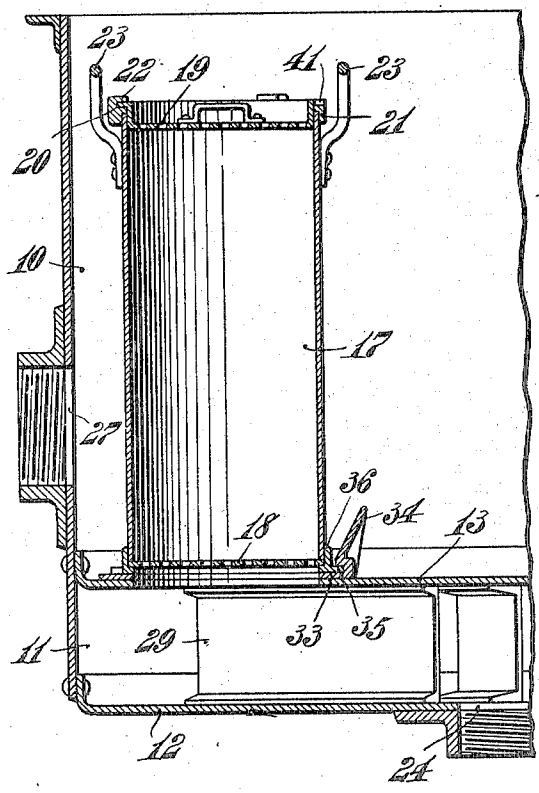


Fig. 6.

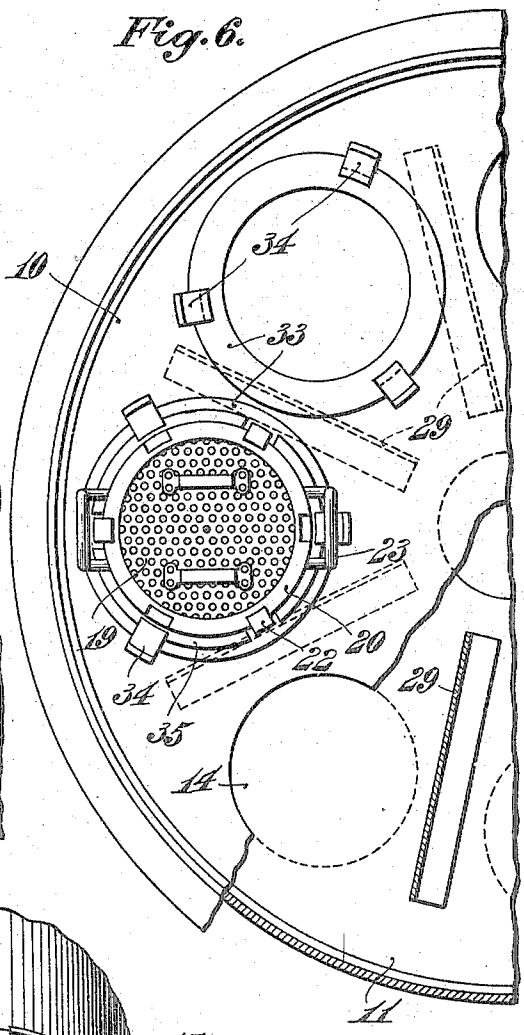
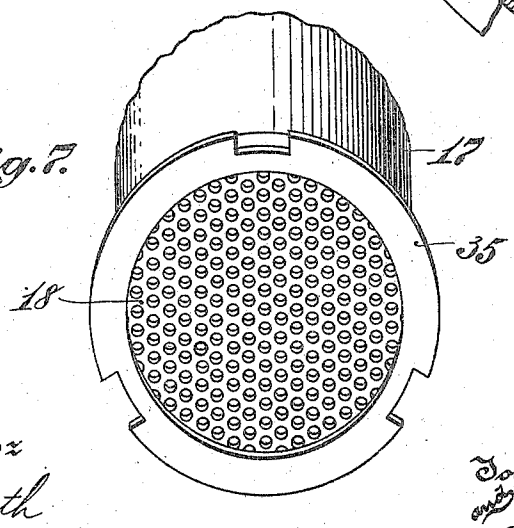


Fig. 7.



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UNITED STATES PATENT OFFICE.

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DYEING-MACHINE.

957,801. Specification of Letters Patent. Patented May 10, 1910.

Application filed December 7, 1909. Serial No. 531,794.

To all whom it may concern:

Be it known that we, JOSEPH RICHARDSON and JACOB F. NEEF, respectively a subject of the King of Great Britain (who has declared his intentions of becoming a citizen of the United States) and a citizen of the United States, both residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Dyeing-Machines, of which the following is a specification.

Our invention relates to dyeing machines, and it has particular relation to the construction and arrangement of a machine for dyeing raw stock, such as ramie, jute in cones, raw wool, raw cotton, and worsted tops.

The principal object of our invention is to provide a machine for dyeing textile materials in which all portions of the same will be uniformly subjected to the action of the dye liquor.

The nature and characteristic features of our invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof, in which,

Figure 1 is a vertical central section of a dyeing tank having a series of material-containing cylinders mounted therein, constituting the principal part of our present invention; Fig. 2 is an elevation, on a reduced scale, of the dyeing tank, showing also the means for circulating the dye liquor therethrough; Fig. 3 is a plan, partly in section and with certain parts removed, of the dyeing tank shown in Fig. 1; Fig. 4 is a perspective of a removable perforated top cover for the material-containing cylinders; Fig. 5 is a vertical central section, similar to Fig. 1, of a modified form of dyeing tank; Fig. 6 is a fragmentary plan thereof, partly in section and with certain parts removed; and Fig. 7 is a perspective of the lower portion of one of the material-containing cylinders shown in Figs. 5 and 6.

In the particular embodiment of our invention shown in Figs. 1 to 4 of the drawings, 10 is a cylindrical tank, preferably made of sheet steel, which is secured at its bottom edge to the base casting 11. Base casting 11 is provided with the bottom horizontal wall 12 and the perforate top horizontal wall 13. The top horizontal wall 13 forms a diaphragm separating the upper tank 10 and the base casting 11 into two chambers. The upper horizontal wall 13 is provided with a plurality of circular openings 14 in each of which is secured a ring 15 interiorly threaded to receive a threaded ring 16 which is carried at the lower end of each of the material-containing cylinders 17. The threaded ring 16 is offset and serves to maintain the perforated bottom plate 18 in place at the lower end of the material-containing cylinder 17. Each material-containing cylinder 17 is provided with a removable perforated top cover 19. The top cover 19 is removably secured to the top of the material-containing cylinder 17 by means of an outwardly extending flange 20 suitably recessed at various points on its periphery as at 41, and a ring 21 is carried at the upper end of each material-containing cylinder 17, the ring 21 having a series of lugs 22 extending over the flange 20 of the top cover 19, the construction being such that the top cover 19 may be rotated to bring the recesses 21 to such position with respect to the lugs 22 that the cover may be thereby readily removed. The material-containing tanks 17 are provided with handles 23 near the top thereof so that the operator may readily unscrew any of said material-containing cylinders 17 from the threaded ring 15 and thereby if desired remove the same from the dyeing tank 10. The lower horizontal wall 12 of the base casting 11 is provided with a centrally disposed opening 24 and a pipe 25 is preferably connected at this point, which pipe communicates with the outlet end of a centrifugal or other type of circulating pump 26, which is in communication, by means of a pipe 28, with an opening 27 in the side wall of the tank 10 above the horizontal diaphragm 13. Radiating from the central opening 24 in the bottom of the base casting 11 is a series of vertical walls 29, preferably cast integral with the top and bottom horizontal walls 13 and 12 respectively. The bottom horizontal wall 12 of the base casting 11 is also provided with a suitable outlet 30, to which may be secured a pipe 31 having a valve 32 mounted therein, so that the dye liquor may be drawn off from the tank 10 when desired.

It will be seen that the dye liquor which is caused to circulate from the top tank 10 through pipes 28 and 25 by means of the circulating pump 26 will enter the base casting 11 at the center thereof, and will be

equally distributed through said base casting 11 by means of the vertical walls 29, after which the dye liquor will pass through each of the vertical material-containing cylinders 17, overflowing from the top thereof into the tank 10. The radiating vertical walls 29 will cause an equal distribution of the dye liquor through all of the vertical material-containing cylinders 17, notwithstanding any differences of resistance which may exist in the same, and by arranging the material-containing cylinders 17 so that the dye liquor is forced to travel vertically therethrough all of the material contained therein will be uniformly subjected to the action of the dye liquor.

In the embodiment of our invention shown in Figs. 5 to 7 of the drawings, the dyeing tank 10 and the base 11 are both formed of an integral piece of sheet steel, to which the horizontal walls 12 and 13, also formed of sheet steel, are riveted, and the radiating vertical walls 29 are preferably formed in this instance by means of short lengths of channel beams riveted or otherwise secured to the horizontal walls 12 and 13. In Figs. 5 to 7 there is also shown a modified means for securing the material-containing tanks 17 to the perforate horizontal wall 13, which consists of a ring 33 secured in place on the horizontal wall 13 at each of the openings therein. The ring 33 is provided with a series of outwardly flaring projections 34 which at the lower portion thereof extend over a flange 35 extending outwardly from a ring 36 carried by the bottom of the material-containing cylinder 17. The flange 35 of the ring 36 is recessed at suitable points so that when the cylinder 17 is turned to the proper position the recesses will be brought opposite the overlapping projections 34 and thereby permit the cylinder 17 to be removed.

Having thus described the nature and characteristic features of our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a dyeing apparatus, a tank, a diaphragm arranged in said tank dividing the same into two compartments, a plurality of openings in said diaphragm, material-containing receptacles having their lower ends detachably mounted in the openings in the diaphragm and extending vertically upward therefrom, said material-containing receptacles having perforated bottoms and removable perforated top covers, a centrally disposed inlet communicating with the compartment below the diaphragm, and a plurality of vertical walls arranged in said lower compartment and extending radially outward from said inlet.

2. In a dyeing apparatus, a tank, a diaphragm arranged in said tank dividing the same into two compartments, a plurality of openings in said diaphragm, material-containing receptacles having their lower ends detachably mounted in the openings in the diaphragm and extending vertically upward therefrom, said material-containing receptacles having perforated bottoms and removable perforated top covers, a centrally disposed inlet communicating with the compartment below the diaphragm, a plurality of vertical walls arranged in said lower compartment and extending radially outward from said inlet, and means for causing the dye liquor to circulate from the upper to the lower compartment and thence through the material-containing receptacles.

In testimony whereof, we have hereunto affixed our signatures in the presence of two witnesses.

JOSEPH RICHARDSON.
JACOB F. NEEF.

Witnesses:
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S. MURDOCK.