H. M. DUDLEY.

DYEING MACHINE.

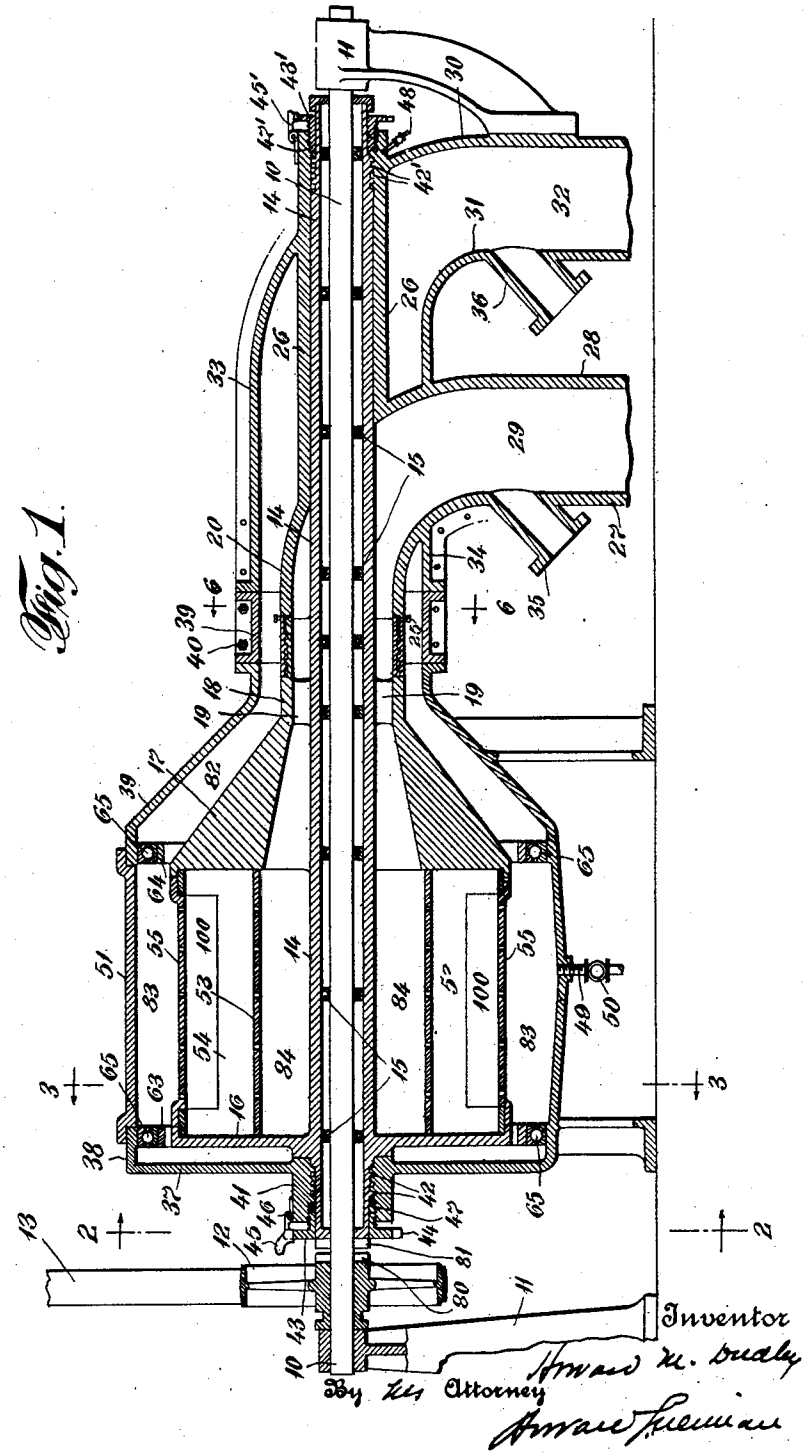
APPLICATION FILED DEC. 1, 1919.

1,395,669.

Patented Nov. 1, 1921.

5 SHEETS—SHEET 1.

Fig. 1.



Inventor

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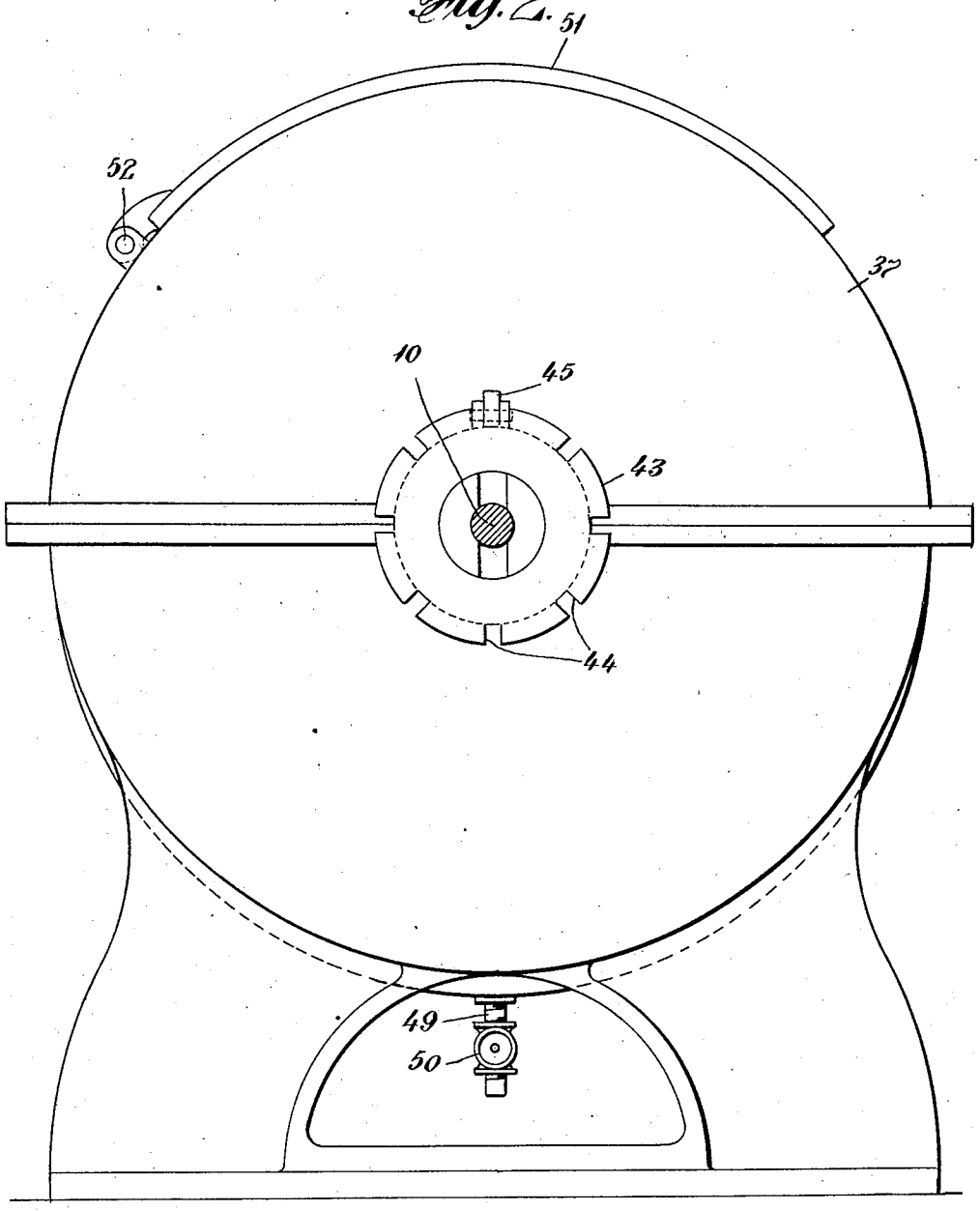
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5 SHEETS—SHEET 2.

Fig. 2.



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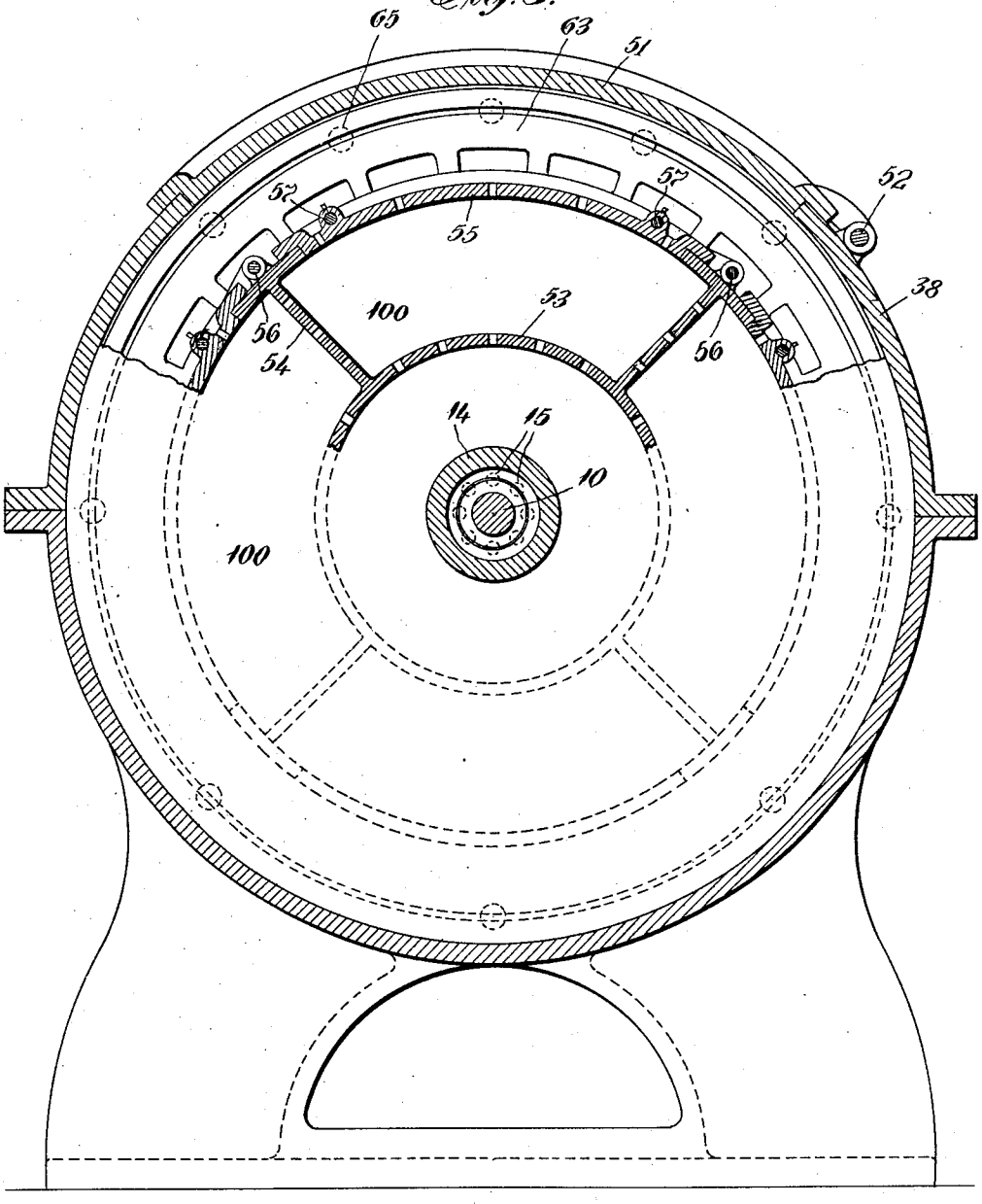
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5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

Fig. 5.

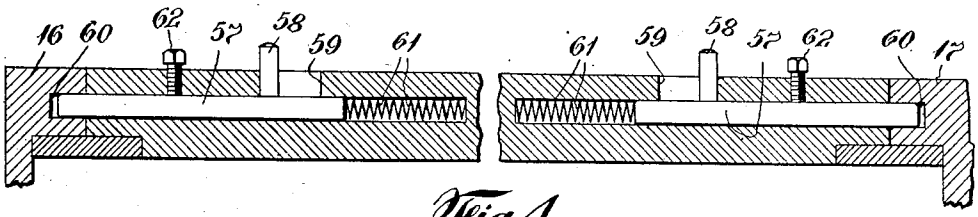
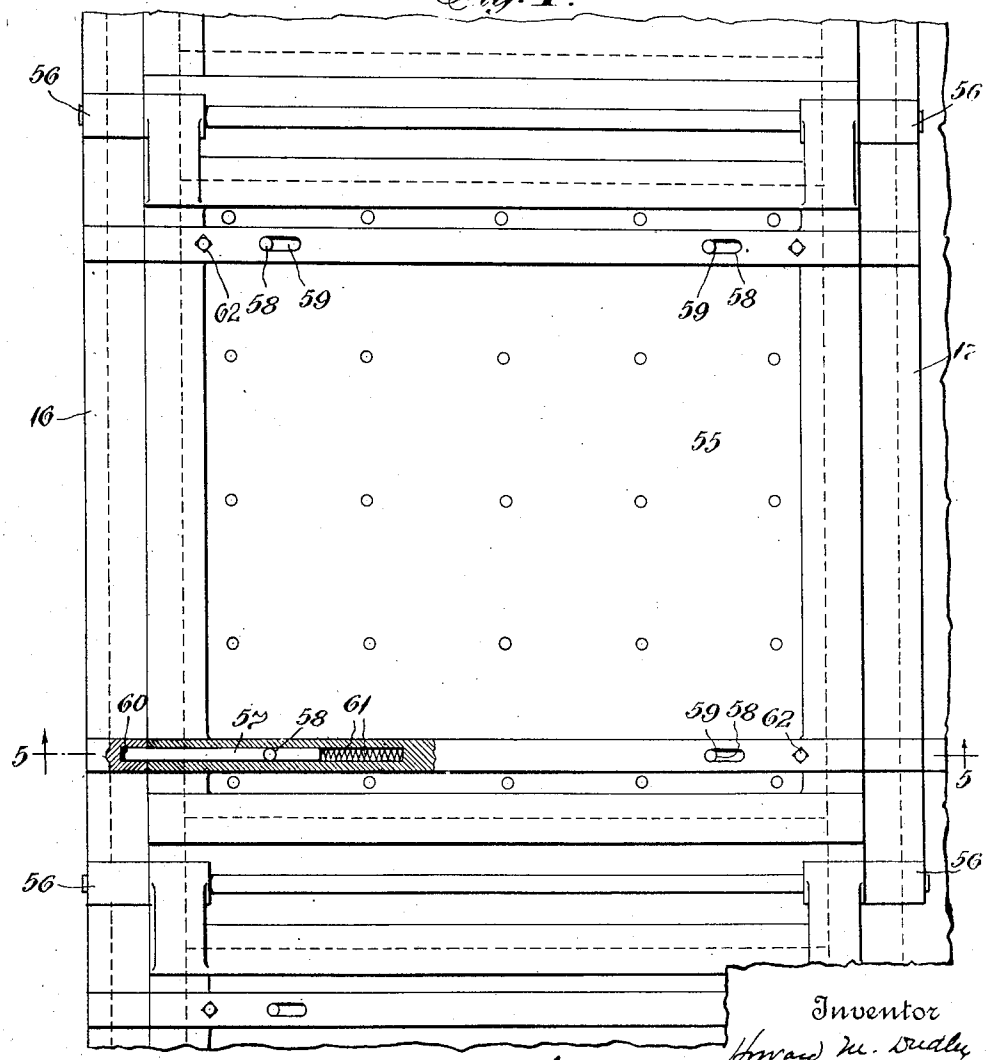


Fig. 4.



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5 SHEETS—SHEET 5.

Fig. 7.

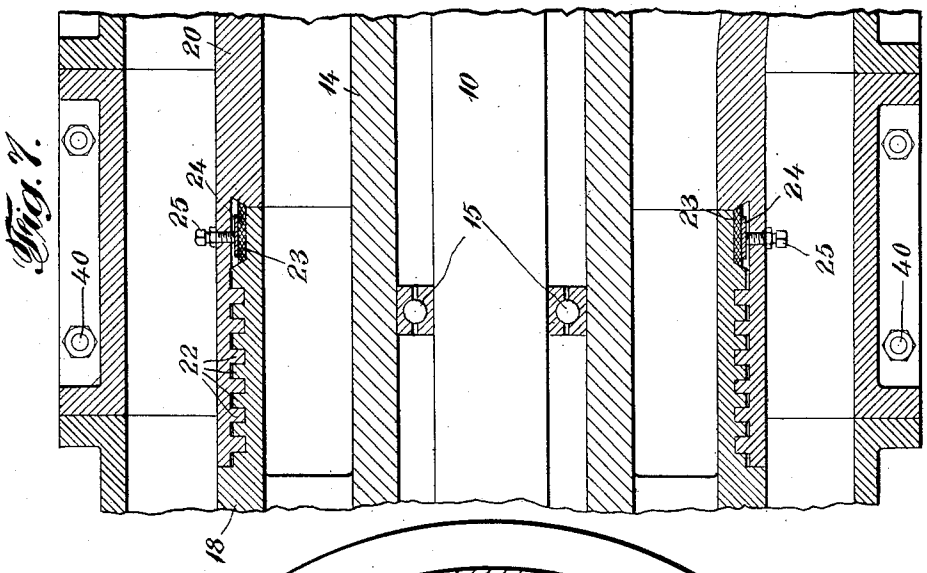
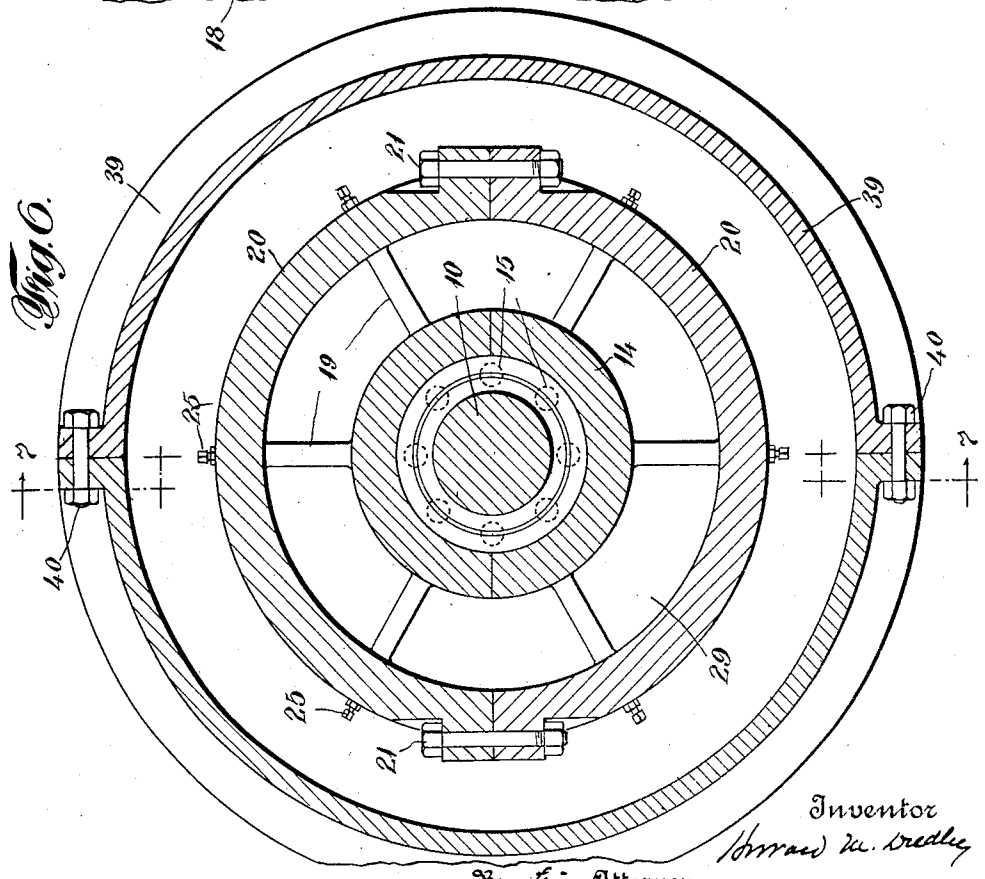


Fig. 6.



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UNITED STATES PATENT OFFICE.

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DYEING-MACHINE.

1,395,669. Specification of Letters Patent. Patented Nov. 1, 1921.

Application filed December 1, 1919. Serial No. 341,678.

To all whom it may concern:

Be it known that I, HOWARD M. DUDLEY, a citizen of the United States, residing in the city of 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 full, clear, and exact specification.

My invention relates to dyeing machines and refers particularly to machines suitable for the dyeing of fabrics such as hosiery and similar fabric forms.

My invention relates to devices whereby fabric forms may be readily and evenly dyed by a circulating dyeing liquid while the fabric is being moved therethrough and includes means for the passage of air through the fabric during the movement of the latter.

In the accompanying drawings illustrating one form of the device of my invention, similar parts are designated by similar numerals.

Figure 1 is a vertical cross-section of one form of my device.

Fig. 2 is a section through the line 2—2 of Fig. 1.

Fig. 3 is a section through the line 3—3 of Fig. 1.

Fig. 4 is a development of a portion of the device showing the covers to the fabric chambers.

Fig. 5 is a broken section through the line 5—5 of Fig. 4.

Fig. 6 is a section through the line 6—6 of Fig. 1.

Fig. 7 is a section through the line 7—7 of Fig. 6.

The particular form of my device, shown in the accompanying drawings, comprises a stationary shaft 10, supported by the supporting arms 11, 11 and carrying a revoluble shifting pulley 12 capable of being connected by the belt 13 to a source of revoluble power. Revoluble upon the shaft 10 is a sleeve 14, ball-bearings 15, 15 being interposed between the shaft 10 and the sleeve 14. The sleeve 14 carries the annular end plate member 16 and also the hollow conical member 17 which is extended into the hollow cylindrical member 18, the members 17 and 18 being connected to the sleeve 14 by the arms 19, 19. The member 18 is revoluble within the stationary sleeve 20 as shown particularly in Figs. 6 and 7. The sleeve 20, for purposes of ease of assembly, is made in two parts connected together by the bolts 21, 21. A tight revoluble joint is maintained between the members 18 and 20 by means of the projections and grooves 22, 22, a packing material 23 being had in position by the split ring 24 and the screw bolts 25, 25. The upper portion of the member 20 is extended into the sleeve portion 26, while the lower portion of the member 20 is extended downwardly into the wall 27 which, with the wall 28 forms the annular conduit 29. The wall 30 carried by the member 26, and the wall 31 carried by the member 28, form an annular conduit 32, the extension of which is formed by the wall 33 carried by the member 26 and the wall 34 carried by the member 27. A pipe 35, having a valve not shown, is connected to the conduit 29, and a pipe 36 having a valve, not shown, is connected to the conduit 32.

A liquid chamber, within which the sleeve 14 is revoluble, comprises the end 37, the annular side 38 and the conical-shaped end 39. The end 39 is fixedly attached to the members 33 and 34 by means of the annular channel bar 39 made of the two parts attached by means of the bolts 40, 40. A tight joint is made between the annular members 41 of the end 37 and the sleeve 14 by means of the projections and grooves 42, 42. Threaded within the interior of the member 41 is an annular member 43, the outer periphery of which has a series of indents 44, 44. Carried by the member 41 is a latch, or pawl, 45, revolubly pivoted at 46. A ring of packing material 47 is placed around the sleeve 14, the member 43 screwed inwardly to compress the packing, and when properly packed, the pawl 45 is dropped into one of the indents 44, thus preventing the movement of the member 43, The other end of the revoluble sleeve 14 and the surrounding stationary member are similarly packed and jointed as indicated by corresponding prime numerals. A drain pipe 48 is introduced for the purpose of withdrawing any liquid that might find its way behind the packing. The pulley 12 has a series of teeth 80, 80, capable of meshing with teeth 81, 81 carried bythe member 14.

A drain pipe 49 having the valve 50, is connected with the interior of the liquid receptacle.

The upper portion of the side member 38 carries a door 51 pivoted at 52.

Spaced from the sleeve 14, and extending between the ends 16 and 17, is an annular foraminous member 53, from which extends a series of spaced foraminous plates 54, 54 connecting the ends 16 and 17, thus forming a series of fabric compartments 100, 100 with foraminous bottoms and sides.

Each fabric compartment has a foraminous cover 55 hinged at 56, 56 to the members 16 and 17. In order to lock each cover 55 in a closed position, the cover carries a series of oppositely opposed slidable bolts 57, 57, each having a pin or handle, 58, extending through an opening 59. Each bolt 57 is slidable within an indent 60 in the end member 16 or 17, being maintained therein by means of a spiral spring 61. A screw bolt 62, abuttable upon the bolt 57, can be used as a means for holding the bolt in either an engaged, or disengaged, position with respect to the indent 60.

The annular member 63 of the end member 16, and the annular member 64 of the end member 17, are revoluble upon the series of ball-bearings 65, 65, 65, 65 of the non-revoluble members 38 and 39.

The chambers 29 and 32 are connected with a source of dye liquid supply and have suitable valves, not shown, and the pipes 27 and 36 are connected with a source of air supply and have suitable valves, not shown.

The operation of the device is as follows:—

The proper amount of fabric is introduced into a fabric compartment 100 through the opening in the member 38, caused by opening the door 31, and through the opening caused by opening the cover 55. The cover 55 is then closed and locked by means of the bolts 57, 57 and the device revolved to bring the next fabric compartment in position for charging with fabric. When all of the fabric compartments have been loaded, the door 31 is closed and locked. The pulley 12 is shifted so that its teeth 80, 80 mesh with the teeth 81, 81 of the member 14 and a revoluble movement given the pulley 12 by means of the belt 13. Dye liquid is now passed through the conduit 32, the valves, not shown, of pipes 35 and 36 being closed. The liquid passes through the conduit 32, the chamber 82 between the members 17 and 39, the chamber 83, the foraminous covers 55, 55, the fabric chambers 100, 100 and the fabric therein, the foraminous members 53, 53, the chamber 84 and thence outwardly through the conduit 29 for continuous circulation. At the same time the liquid has free circulation between the fabric chambers 100, 100 through the foraminous plates 54, 54. A reverse movement of the liquid may be accomplished by passing the liquid inwardly through the conduit 29, the chamber 83, the plates 55, 55, the fabric chambers 100, 100, the plates 53, 53 and the chambers 84 and 82 and the conduit 32.

When it is desired to pass air through the device, the valves, not shown, to the conduits 29 and 32 are closed and the valves, not shown, to the pipes 35 and 36, are opened, the liquid drained from the receptacle through the pipe 49 and air is forced alternately through the pipes 35 and 36.

It will thus be seen that liquid and air can be passed in opposite directions through the device while the fabric chambers and their contents are being revolved.

The device of my invention is not limited to the particular size, shape, number and arrangement of parts, as shown and described, all of which may be varied without going beyond the scope of my invention as described and claimed.

What I claim is:—

1. In a dyeing machine, in combination, a receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, means for revolving the sleeve, a series of foraminous dyeing chambers carried by the sleeve within the receptacle, a chamber surrounding the foraminous dyeing chambers, means whereby a liquid may be introduced simultaneously and continuously into all portions of one end of the surrounding chamber and means whereby a liquid may be passed through the dyeing chambers and then through the receptacle.

2. In a dyeing machine, in combination, a stationary receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, a series of dyeing chambers each having a foraminous outer member, a foraminous inner member and foraminous longitudinal sides carried within the receptacle by the sleeve, a chamber surrounding the foraminous dyeing chambers, means whereby a liquid may be introduced simultaneously and continuously into all portions of one end of the surrounding chamber and means for passing a liquid through the foraminous members of the dyeing chambers and then through the receptacle.

3. In a dyeing machine, in combination, a stationary receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, two spaced annular end plates carried by the sleeve within the receptacle, an annular foraminous inner plate spaced from the sleeve and connecting the two end plates, a series of spaced side foraminous plates extending outwardly from the inner plate, a removable foraminous outer plate closing the dyeing chambers thus formed, a chamber surrounding the foraminous dyeing chambers, means whereby a liquid may be introduced simultaneously

and continuously into all portions of one end of the surrounding chamber and means for forcing a liquid through the foraminous members of the dyeing chambers and thence through the receptacle.

4. In a dyeing machine, in combination, a stationary receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, means for revolving the sleeve, two spaced annular end plates carried by the sleeve within the receptacle, an annular foraminous inner plate spaced from the sleeve and connecting the two end plates, a series of spaced side foraminous plates extending outwardly from the inner plate, a removable foraminous outer plate closing the dyeing chambers thus formed, a chamber surrounding the foraminous dyeing chambers, means whereby a liquid may be introduced simultaneously and continuously into all portions of one end of the surrounding chamber and means for forcing a liquid through the foraminous members of the dyeing chambers and thence through the receptacle.

5. In a dyeing machine, in combination, a receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, a gear pulley carried by the shaft and slidable thereon, means for revolving the pulley, means whereby the pulley may be meshed with the sleeve revolving the latter, a series of foraminous dyeing chambers carried by the sleeve within the receptacle, means surrounding the foraminous dyeing chambers, means whereby a liquid may be introduced simultaneously and continuously into all portions of one end of the surrounding chamber and a chamber whereby a liquid may be passed through the dyeing chambers and then through the receptacle.

6. In a dyeing machine, in combination, a receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, means for revolving the sleeve, a series of foraminous dyeing chambers carried by the sleeve within the receptacle, means whereby a liquid may be passed through the receptacle and then through the dyeing chambers, means whereby a liquid may be passed through the dyeing chambers and then through the receptacle and means for forcing air in reverse directions through the device.

7. In a dyeing machine, in combination, a stationary receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, a series of ball bearings between the shaft and the sleeve, two spaced annular end plates carried by the sleeve within the receptacle, an annular foraminous inner plate spaced from the sleeve and connecting the two end plates, a series of spaced side foraminous plates extending outwardly from the inner plate, a removable foraminous outer plate closing the dyeing chambers thus formed, means for forcing a liquid into the receptacle and thence through the foraminous members of the dyeing chambers, means for forcing a liquid through the foraminous members of the dyeing chambers and thence through the receptacle and means for forcing air in reverse directions through the device.

8. In a dyeing machine, in combination, a stationary receptacle, a stationary shaft passing through the receptacle, a revoluble sleeve supported by the shaft, a gear pulley carried by the shaft and slidable thereon, means for revolving the pulley, means whereby the pulley may be meshed with the sleeve revolving the latter, a series of ball bearings between the shaft and the sleeve, two spaced annular end plates carried by the sleeve within the receptacle, an annular foraminous inner plate spaced from the sleeve and connecting the two end plates, a series of spaced side foraminous plates extending outwardly from the inner plate, a removable foraminous outer plate closing the dyeing chambers thus formed, a series of ball bearings between the end plates and the sides of the receptacle, means for forcing a liquid into the receptacle and thence through the foraminous members of the dyeing chambers, means for forcing a liquid through the foraminous members of the dyeing chambers and thence through the receptacle and means for forcing air in reverse directions through the device.

Signed at Chelsea in the county of Suffolk and State of Mass. this 22nd day of November, 1919.

HOWARD M. DUDLEY.