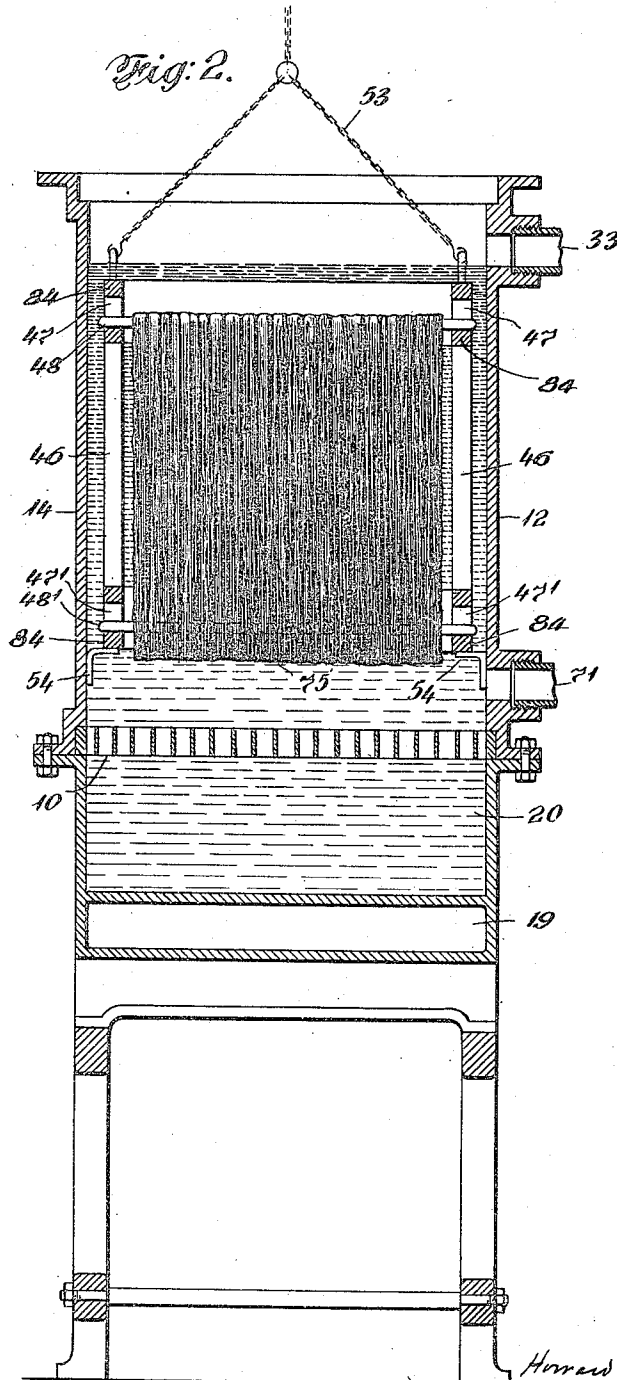


1,268,441.

H. M. DUDLEY.
SKEIN DYEING MACHINE.
APPLICATION FILED JUNE 28, 1917.

Patented June 4, 1918.

4 SHEETS—SHEET 2.



Inventor
H. M. Dudley

By his Attorney

Harold Freeman

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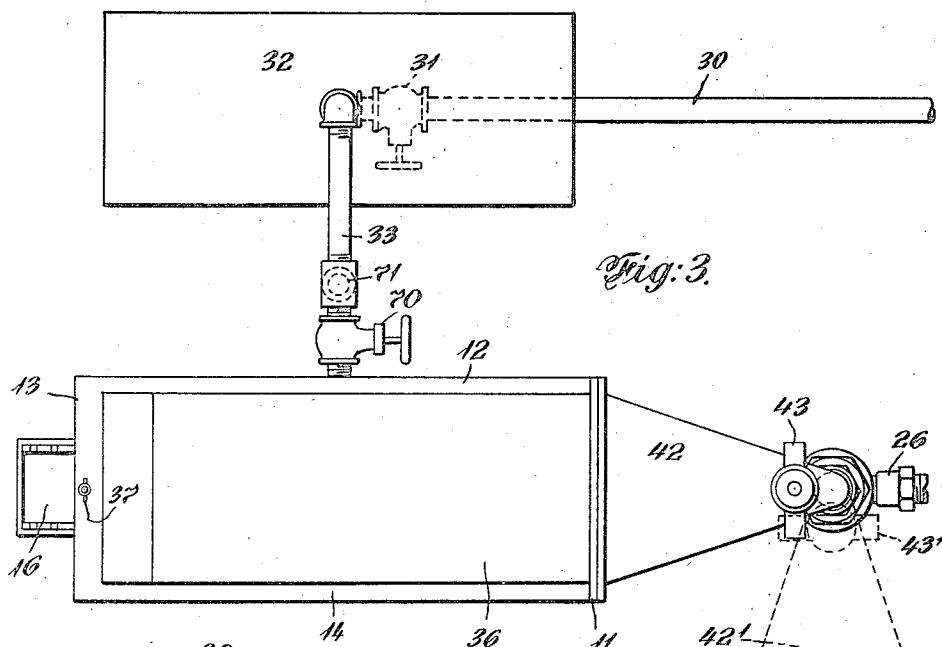


Fig. 3.

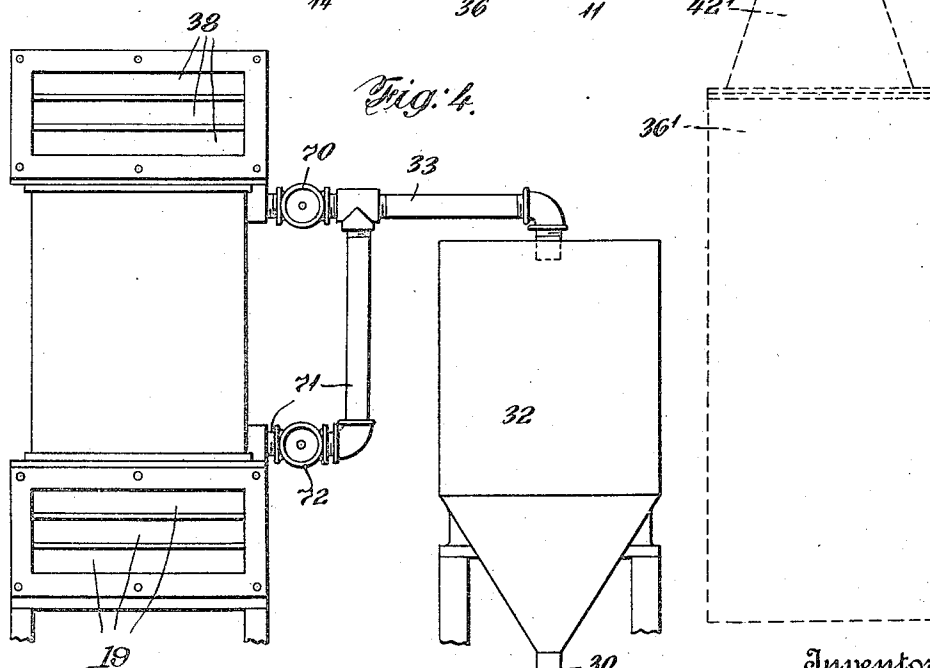


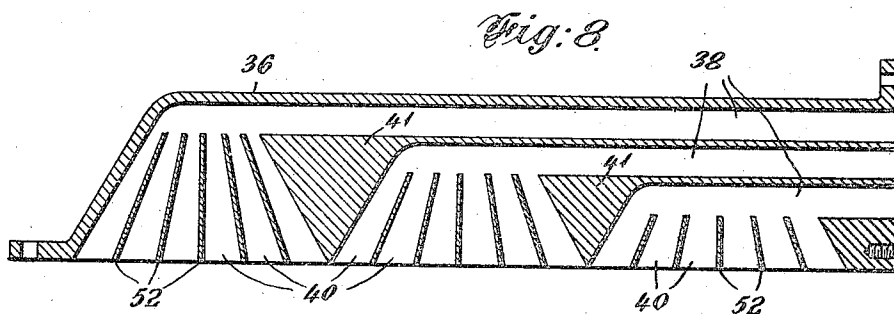
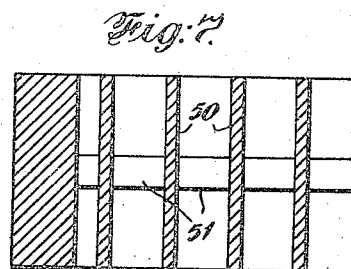
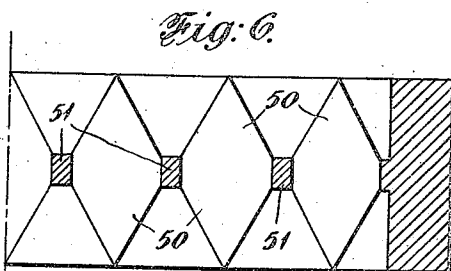
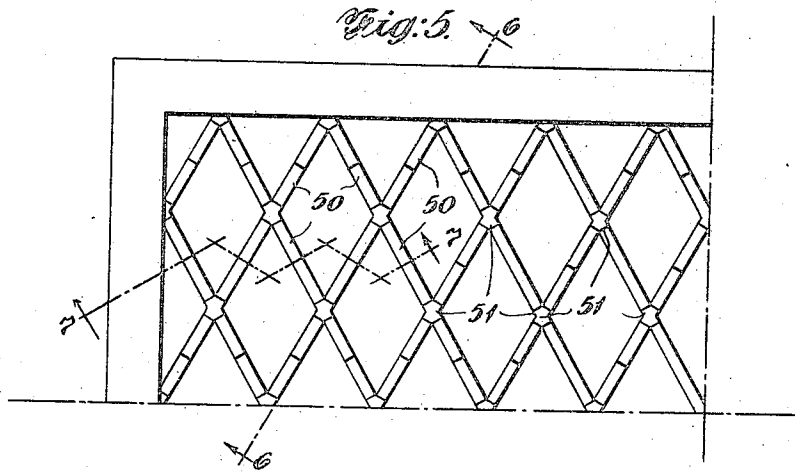
Fig. 4.

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UNITED STATES PATENT OFFICE.

HOWARD M. DUDLEY, OF PHILADELPHIA, PENNSYLVANIA.

SKEIN-DYEING MACHINE.

1,268,441.

Specification of Letters Patent.

Patented June 4, 1918.

Application filed June 28, 1917. Serial No. 177,457.

To all whom it may concern:

Be it known that I, HOWARD M. DUDLEY, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Skein-Dyeing Machines, of which the following is a specification.

My invention relates to skein dyeing machines and refers particularly to machines suitable for the dyeing of skeins by means of a circulating dye liquor.

One object of my invention is a device whereby skeins of textile fibers may be dyed evenly without manual manipulation.

Another object of my invention is a device in which a dye liquor may be passed in opposite directions through fiber skeins.

Another object of my invention is a device in which those portions of the skein which rest upon the supporting bars are dyed evenly with other portions of the skein.

Another object of my invention is a device in which the dye liquor is distributed evenly throughout the dyeing chambers.

Another object of my invention is a testing device whereby the condition of the fiber in the dyeing chamber may be determined without opening the dyeing chamber or disturbing or injuring the skein yarns therein.

These and other objects of my invention will be evident upon a consideration of my specification, drawings and claims.

In the dyeing of skein yarns it is necessary that the skeins be moved continuously through the dye liquor or that the dye liquor be passed continuously through the skeins in order that all portions of the yarn receive equal treatment to produce even dyeings.

It is further necessary in the dyeing of fibers of this character, to suspend or support each skein separately in order that the fibers may not become tangles and thus interfere with the further operations. There is a tendency toward uneven dyeings at those portions of the skein which rest upon the supporting means, and which are usually not subjected to the same treatment as those portions which are subjected to free treatment of the dye liquor.

My device overcomes all of the above and other difficulties and presents a method whereby uniform and even dyeing results

may be obtained with a minimum of time, labor and expense.

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

Figure 1 is a vertical cross-section of one form of my device, with the raised position of the cover indicated in dotted lines.

Fig. 2 is a cross-section through the line 2-2 of Fig. 1 with the upper foraminous plate removed, and the hoisting device in position for removing the skein frame.

Fig. 3 is a top plan view of Fig. 1 with the revolved position of the cover indicated in dotted lines.

Fig. 4 is a cross-section through the line 4-4 of Fig. 1.

Fig. 5 is a broken top plan view of the foraminous plates.

Fig. 6 is a cross-section through the line 6-6 of Fig. 5.

Fig. 7 is a cross-section through the line 7-7 of Fig. 5.

Fig. 8 is a vertical cross-section of a modification of the tubular members.

The form of my device as illustrated comprises a dyeing chamber formed by the fixed foraminous bottom 10, the sides 11, 12, 13, 14 and the removable foraminous top 15. A testing chamber 16 is situated adjacent to the dyeing chamber and connected thereto by the upper opening 17 and the lower opening 18 through the side 13. The lower face of the foraminous bottom 10 is connected with a series of tubular members 19, 19, 19 having the upwardly divergent openings 20, 20, 20 formed by the end members 21, 21, 21 of the tubular members. These tubular members 19, 19, 19 lead into a pipe 22, carrying the valve 23, the pipe 22 being connected with the pipe 24 carrying the universal joint 25. The pipe 24 is connected with the pipe 26, which in turn is connected with the pump 27. The other side of the pump 27 is connected with the pipe 27, which is connected with the pipe 28, carrying the valve 29. The pipe 28 is connected with a liquid supply tank (not shown). The pipe 27 is also connected with the pipe 30 carrying the valve 31, the pipe 30 being connected with the bottom of the reserve liquid tank 32. A pipe 33 carrying the valve 34 connects the upper portion of the dyeing chamber with the top of the reserve tank 32. A pipe 35, carrying the valve 36 connects

the bottom of the dyeing chamber with the pipe 33 and hence with the reserve tank 32. The pump 57 carries the pipe 34 with the valve 35 connected with a source of water supply. A cover 36 is capable of being clamped tightly to the side walls of the dyeing chamber by means of the wing-nut clamp 37. Within the cover 36, and carried thereby, are a series of tubular members 38.38.38 formed by the walls 39.39.39 and having downwardly divergent openings 40.40.40, formed by the end members 41.41.41 abutting upon the upper face of the foraminous top 15. The tubular members extend outwardly into the tube or pipe 42, carrying the valve 43, and connected with the tube or pipe 44 connected with the universal joint 25. The joint 25 allows the cover 36 and the tubular members 38.38.38 to be revolved vertically into the position shown in dotted lines in Fig. 1 and then revolved horizontally as shown in dotted lines in Fig. 3.

The skein holding means comprises a frame-work of the side members 84.84, connected together and the vertical members 46.46. Within the side members 44.44 are a series of slots or openings 47.47' into which the round supporting bars 48.48.48' may be introduced and from which they may be readily removed. A similar frame-work and supporting rods are introduced into the testing device 16.

The foraminous plates 10 and 15 consist of parallel and intersecting upwardly and downwardly extended converging members 50.50 between which are the supporting members 51.51.

In the modification shown in Fig. 8, the divergent openings 40.40.40 contain a series of divergent plates 52.52, for the further distribution of the dye liquor.

The operation of the device is as follows: The skein carrying frame is removed from the dyeing chamber by means of the hoisting chain 53, the rods 48.48.48' removed, the skeins placed thereon and the frame with the skeins lowered into the dyeing chamber until it rests upon the lugs 54.54, as shown in Fig. 2, the cover 36 being in the position 36' of Fig. 3. The foraminous top 15 is then placed within the dyeing chamber, the top 36 revolved into the position 36' of Fig. 1, then lowered into the position 36 of Fig. 1, and clamped down by means of the clamp 37. The skein supporting frame with skeins is then placed in the testing device 16. The device is then in position for the dyeing operation.

All of the valves are closed with the exception of 29, 23 and 70 and the pump 57 is started. The dye-liquor passes downwardly through the pipe 28 into the pump 57 from which it is forced through the pipes 26, 24, 22 and the tubular members 19.19.19,

through the foraminous plate 10, the dyeing chamber and the skeins contained therein, out through the pipe 33, into the reserve tank 32. At the same time the dye liquor passes through the opening 18, the testing device with the skeins contained therein and out through the opening 17, thus treating the fiber in the testing device in the same manner as the fiber in the dyeing chamber is treated. When sufficient dye liquor has been obtained from the dye liquor chamber (not shown) through the pipe 28, the valve 29 is closed and the valve 31 is opened. The dye liquor now passes upwardly through the dyeing chamber, outwardly through the pipe 33 into the reserve tank 32 and then through the pipes 30 and 27 into the pump 57, for continuous circulation.

When the dye liquor has passed through the device in this direction for the required length of time, the valves 23 and 70 are closed and the valves 43 and 72 are opened. The dye liquor now passes through the pipes 26, 44, 42, the tubular members 38.38.38, the foraminous top 15, the dyeing chamber and the skeins contained therein, the pipes 71 and 33 into the reserve tank 32 from which it returns to the pump 57, through the pipes 30 and 27 for circulation. At the same time the liquor passes through the opening 17, into and downwardly through the testing machine and the skeins contained therein and through the opening 18 into the bottom of the dyeing chamber. The skeins may be washed by admitting fresh water through the pipe 34 into the pump 57, after closing off the dye liquor.

By having the skeins slightly longer than the distance between the bars 48.48.48'48', they are clear of the bars 48'48' while the liquor is passing downwardly and clear of the bars 48.48 when the liquor passes upwardly thus allowing even dyeings at those portions of the skeins.

I do not limit myself to the particular size, number, shape or arrangement of parts all of which may be varied without going beyond the scope of my invention as described and claimed.

What is claimed is:

1. In a fiber treating device, in combination, a dyeing chamber, a removable fiber carrying frame within the dyeing chamber, a foraminous plate below the fiber carrying frame, a removable foraminous plate above the fiber carrying frame, a second dyeing chamber adjacent to the first dyeing chamber, a fiber carrying frame within the second dyeing chamber, means whereby the upper and lower portions of the second dyeing chamber are connected respectively with the upper and lower portions of the first dyeing chamber to allow of the flow of a liquid therethrough and means whereby a liquid

may be passed in opposite directions through the plates and the dyeing chamber.

2. In a fiber treating device, in combination, a dyeing chamber, a removable fiber carrying frame within the dyeing chamber, a foraminous plate below the fiber carrying frame, a removable foraminous plate above the fiber carrying frame, the foraminous plates having extended diverging members with openings between them, a second dyeing chamber adjacent to the first dyeing chamber, a fiber carrying frame within the second dyeing chamber, means for the passage of a liquid connecting the top and bottom portions of the second dyeing chamber respectively with the top and bottom portions of the first dyeing chamber, and means whereby a liquid may be passed in opposite directions through the plates and the dyeing chamber.

3. In a fiber treating device, in combination, a dyeing chamber, a removable skein carrying frame within the dyeing chamber, a foraminous plate below the skein carrying frame, a foraminous plate above the skein carrying frame, a series of tubular members abutting upon the outer face of each of the foraminous plates and means for passing a liquid in either direction through the tubular members, the foraminous plates and the dyeing chamber.

4. In a fiber treating device, in combination, a dyeing chamber, a removable skein carrying frame within the dyeing chamber, a foraminous plate below the skein carrying frame, a foraminous plate above the skein carrying frame, a series of tubular members abutting upon the outer face of each of the foraminous plates, a second dyeing chamber adjacent to the first dyeing chamber, a fiber

carrying frame within the second dyeing chamber, means for the passage of a liquid connecting the top and bottom portions of the second dyeing chamber respectively with the top and bottom portions of the first dyeing chamber, and means for passing a liquid in either direction through the tubular members, the foraminous plates and the dyeing chamber.

5. In a fiber treating device, in combination, a dyeing chamber, a removable skein carrying frame within the dyeing chamber, a foraminous plate below the skein carrying frame, a foraminous plate above the skein carrying frame, the foraminous plates having extended diverging members with openings between them, a series of tubular members abutting upon the outer face of each of the foraminous plates and means for passing a liquid in either direction through the tubular members, the foraminous plates and the dyeing chamber.

6. In a fiber treating device, in combination, a dyeing chamber, a removable skein carrying frame within the dyeing chamber, a foraminous plate below the skein carrying frame, a foraminous plate above the skein carrying frame, a series of tubular members abutting upon the outer face of each of the foraminous plates, a series of divergent elements within the tubular members adjacent to the foraminous plates, and means for passing a liquid in either direction through the tubular members, the foraminous plates and the dyeing chamber.

Signed at Phila., in the county of Philadelphia and State of Penn., this twenty-second day of June, 1917.

HOWARD M. DUDLEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."