

(No Model.)

2 Sheets—Sheet 1.

J. H. LORIMER.
DYEING OR SCOURING MACHINE.

No. 393,769.

Patented Dec. 4, 1888.

FIG. 1.

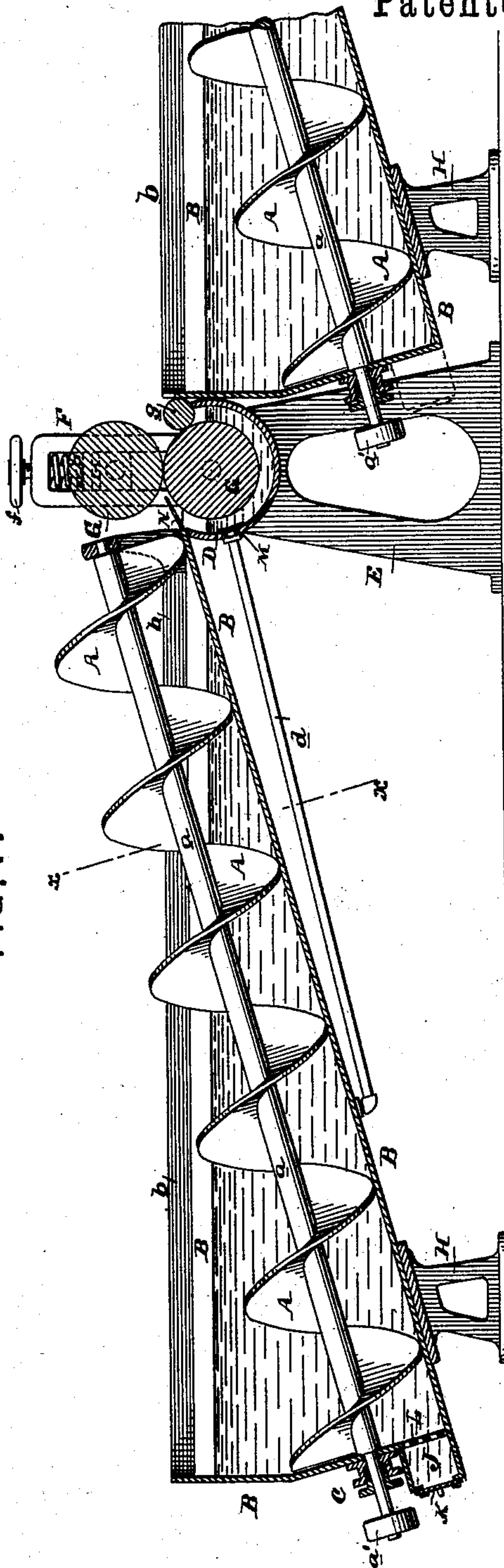
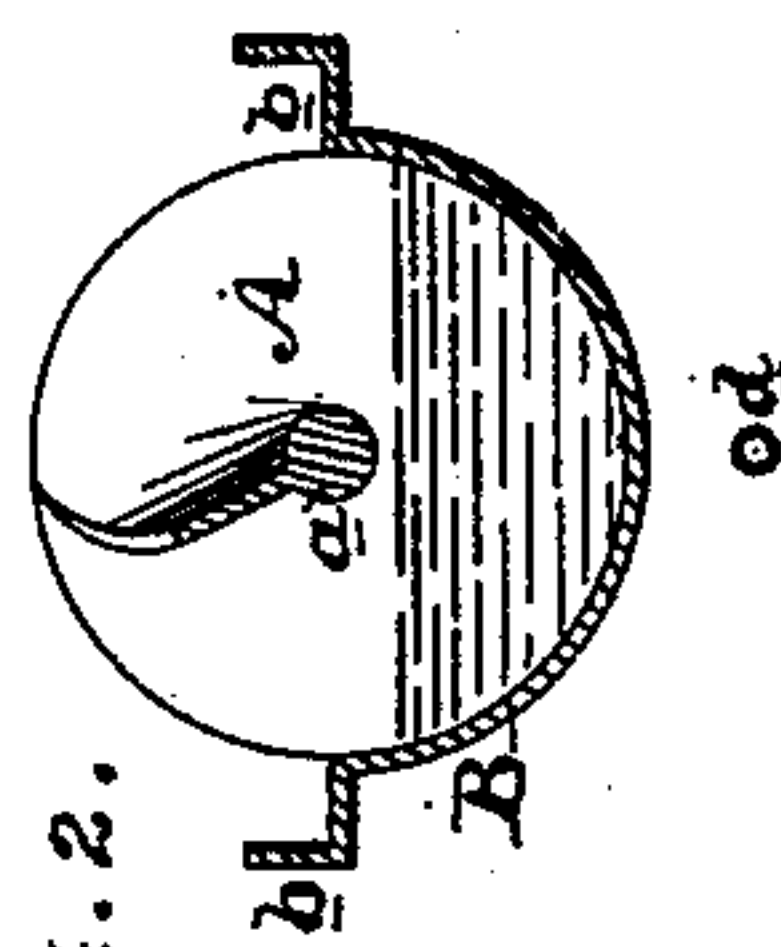


FIG. 2.



Attest:
Henry Drury
E. W. Breckinridge

Inventor:
John H. Lorimer,
By *W. H. Drury*
W. H. Drury

(No Model.)

2 Sheets—Sheet 2.

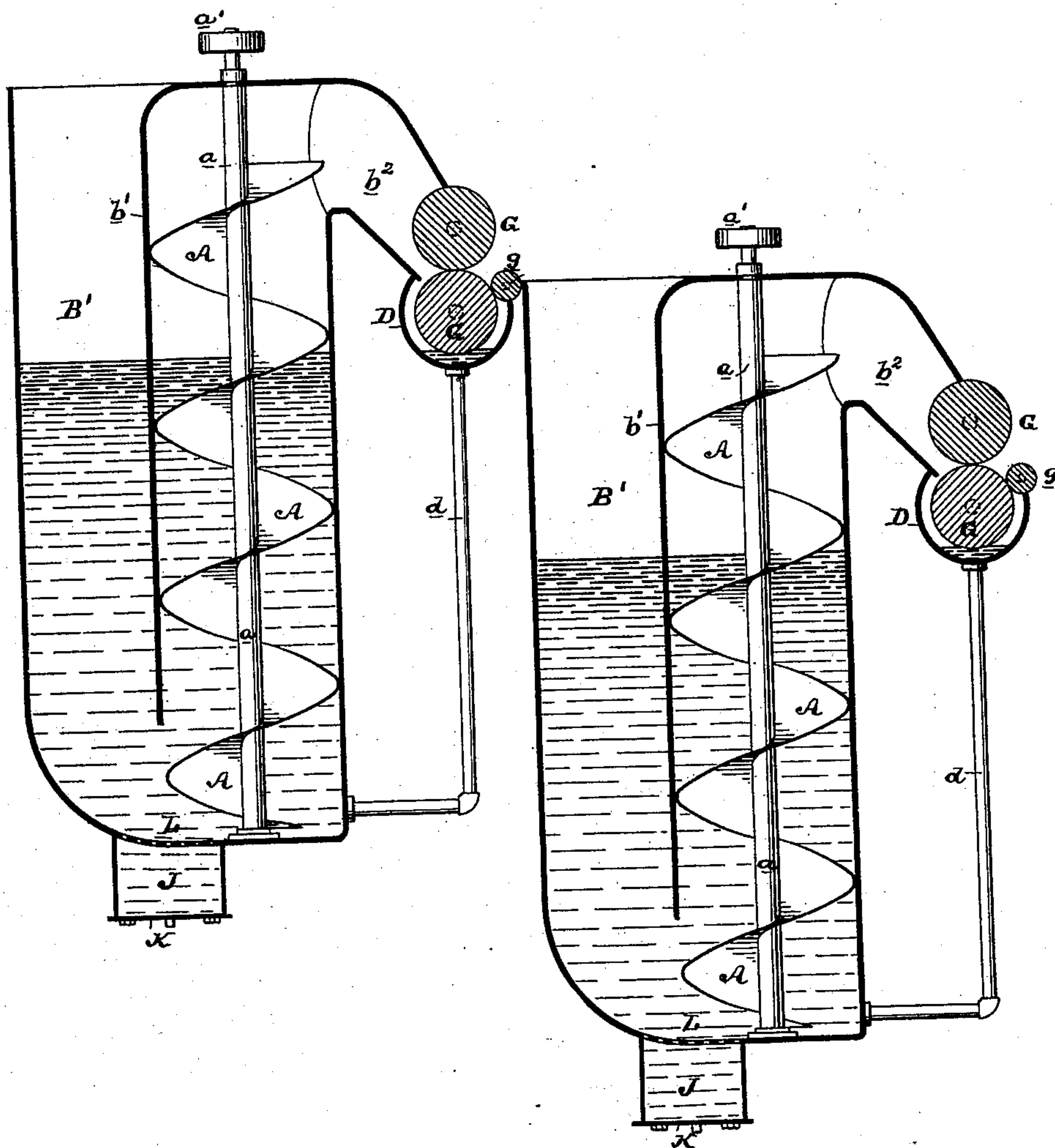
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FIG. 3.



Attest:

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E. W. Breckinridge,

Inventor:

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[Signature]

UNITED STATES PATENT OFFICE.

JOHN H. LORIMER, OF PHILADELPHIA, PENNSYLVANIA.

DYEING OR SCOURING MACHINE.

SPECIFICATION forming part of Letters Patent No. 393,769, dated December 4, 1888.

Application filed October 14, 1887. Serial No. 252,293. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. LORIMER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Dyeing or Scouring Machines, of which the following is a specification.

My invention refers to dyeing or scouring machines in general, but more especially to those adapted to dye or scour wool or other fibrous material.

It consists of certain improvements, which are fully set forth in the following specification, and shown in the accompanying drawings, which form a part thereof.

Prior to the date of my invention scouring and washing machines have been set out in Letters Patent No. 269,984, of 1883, No. 203,995, of 1878, and No. 293,789, of 1884, in which the material to be scoured or washed has been fed up an incline and between rollers either by an endless belt having teeth or by a pair of reciprocating oblique slides, each having upwardly-projecting teeth, so as to gradually cause the material to be drawn up out of the liquid and delivered to the feed-rolls; but in these constructions the feeding devices are located wholly within the tank, as are also the rolls in the first and last of the patents referred to. I do not claim any of these constructions, as my invention comprehends mechanism of an entirely different character.

It is the object of my invention to more perfectly dye or scour the wool or other material to be treated by drawing it gradually through a chamber or vessel filled with the liquid, so that it is thoroughly saturated, the liquid passing through it and permeating every fiber. To this end I use a curved vessel, in which I place a spiral conveyer for the material to be treated. The vessel is filled with the dyeing or scouring liquid, above the surface of which one end of the conveyer emerges. Through this liquid the material is carried by the spiral conveyer, and upon emerging it may be wrung dry and treated similarly in a second vessel.

The particular construction of the parts is immaterial, as the important feature is to convey the fibrous material to be treated through the liquid by means of a conveyer and then subject it to squeezing-rolls.

Referring to the drawings, Figure 1 is a lon-

gitudinal sectional plan view of my improved machine. Fig. 2 is a sectional elevation of the same through the line $x x$, and Fig. 3 is a sectional elevation view of a modified form of my machine in which the vessels are upright.

A is a spiral conveyer having a central shaft, a .

B is a suitable vessel to contain the spiral, the shaft of which is loosely journaled in it at e and e' . The shape of this vessel B should be such that the spiral when placed in it should be on such an incline that one end of the spiral will emerge from the liquid. The triangular form in longitudinal section shown in Fig. 1 is therefore preferred. A lip or gutter, b , is formed upon the upper edges of the vessel B, to collect such of the liquid as may drop from the spiral in its forward movement, or be pushed forward.

a' is a band-wheel at the end of the shaft a , by which the spiral A is put into motion.

E is a frame supporting one end of the vessel B. It also supports the squeezing-rolls G, which are located at the upper end of the spiral, where it emerges from the liquid. It is found most efficacious and desirable to have the line of contact of these rolls even or on a level with the lower edge of the spiral at its upper end. By means of an adjusting-screw and spring, f , on a frame, F, these squeezing-rolls may be adjusted to vary the pressure of the rolls to suit the thickness and kind of material operated upon.

D is a catch basin or vessel located beneath the rolls G to catch the liquid squeezed out of the material. This liquid is conducted back to the vessel B by a pipe, d , leading from the catch-basin D to the vessel below the liquid-level. A stripping-roll, g , is used to conduct the material from the squeeze-roll. In practice it is found advantageous to repeat this operation of dyeing or scouring that has been performed by the vessel A, spiral B, &c., so a second vessel is located immediately at the stripping-roller g , from which the material drops into this second vessel, which is in construction exactly similar to the one described, and so on to any number of vessels, according to the requirements of the case.

H is a small frame to support lower end of the vessel B.

In Fig. 3 a slightly-modified form is shown, in which the spirals are perpendicular, but the general arrangement of the parts is the same as in the form described above. With the upright spirals the vessel B is divided into two compartments by a wall, b' . This wall b' does not, however, extend to the base of the vessel B, so that there is open communication at the bottom between the compartment B' and the spiral A. The material to be treated is dropped into B' and falls to the bottom, whence through this opening it enters the spiral and is carried up by the rotation of this to the top. Here there is a short neck or tube, b^2 , to guide the material to the squeezing-rolls. In other respects the devices of Figs. 1 and 3 are identical.

It is evident that many other forms of vessels might be used, and that there might be various arrangements of the spiral without in the least departing from the spirit of my invention; nor do I limit myself to any mere details of construction, which may manifestly be varied to suit the particular requirements of the case.

While I find the use of two or more dye-vats or scouring-vessels more efficacious, as the dyeing or cleansing process is thus repeated, one vessel alone may be used, if it be so desired, and instead of placing the upright vats or vessels on different levels, as is shown in Fig. 3, so that the wool or other material may be transferred from one to the other, it is evident that they may be placed on the same level, and the transfer accomplished by extending the spiral conductor to a sufficient height above the top of the vessel. I find it advantageous, also, to have a small compartment or chamber, J, at the lower end of the vessel, having a perforated wall or screen, L, through which the fibrous particles and dirt, which result from the washing, may be collected. This chamber J is provided with a door, K, through which the accumulated dirt may be removed, when necessary.

The outlet of the pipe d from the catch-basin D may be provided with a screen or perforated cover, M, to keep such fibers and particles as may have been liberated from the material in washing it from collecting in the pipe and stopping it up as would prevent the return of the liquid to the vessel B and cause the catch-basin to overflow.

To facilitate the delivery of the material operated upon from the spiral conveyer to the squeezing-rolls, I find it advantageous to place a small guide-plate, N, with a smooth surface, between the end of the conductor and the rolls, inclining slightly toward the bite of the latter. This plate N acts as a guide for the wool or other material in its passage to the squeeze-rolls. This machinery, moreover, is suited to a great many purposes other than dyeing or scouring, though I find it most available for those purposes.

In operation the wool or material to be treated is dropped into the vessel B, so that

it is taken up gradually without compression by the rotation of the spiral A and carried through the liquid until it emerges at the squeeze-rolls, which have been previously adjusted to suit the thickness of the material and the pressure required. After it has passed through these squeeze-rollers G, it is guided by the stripper-roll g away from the squeeze-rolls and falls into the second vessel or vat, B, and the operation is repeated.

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

1. In a dyeing or scouring machine, a vessel open at the top and adapted to hold the liquid, in combination with a rotary spiral conductor loosely journaled in said vessel and having one end submerged and the other end exposed to feed the material to be treated upward and through the liquid, and a pair of squeeze-rolls arranged adjacent to the exposed end of the conductor and having their line of contact above the liquid-level.

2. In a dyeing or scouring machine, a vessel open at the top and adapted to hold the liquid, in combination with a rotary spiral conductor loosely journaled in said vessel and having one end submerged and the other end exposed to feed the material to be treated upward and through the liquid, a pair of squeeze-rolls arranged adjacent to the exposed end of the conductor and having their line of contact above the liquid-level, a basin or compartment beneath the squeeze-rolls to catch the expressed liquid, and a passage-way between said basin or compartment and the vessel, so that the liquid expressed may return to the main tank or vessel.

3. In a dyeing or scouring machine, a main tank or vessel to hold the liquid, open at the top and having an inclined bottom, in combination with a rotary spiral conductor contained therein and adapted to feed the material to be treated up said inclined bottom, a pair of squeeze-rolls arranged close to the upper end of the inclined bottom and spiral conductor, so that the material to be treated is moved over said inclined bottom directly into the rolls, a basin or compartment under the squeeze-rolls, and a liquid passage-way connecting the main tank or vessel and the basin or compartment below the normal liquid-level, so that the liquid in both compartments may find the same level.

4. In a dyeing or scouring machine, a suitable vessel to hold the liquid, in combination with a spiral conductor contained therein, squeeze-rolls located near the upper end of said spiral conductor, a basin beneath said squeeze-rolls to catch the liquid squeezed from the material, and a pipe connecting said basin with the main vessel to conduct back the collected liquid to the latter.

5. In a dyeing or scouring machine, a suitable vessel to hold the liquid having an inclined bottom and a lip or gutter about its upper edge, in combination with a rotary spiral

conductor arranged in said vessel and at an incline.

5 6. In a dyeing or scouring machine, a vessel to hold the liquor, squeeze-rolls arranged at one end and above the liquor, a rotary spiral conductor having one end lower than the other and extending from the bottom of the vessel to the squeeze-rolls, and a dirt-collecting compartment arranged in the bottom of

said vessel and at the lower end of said conductor.

In testimony of which invention I hereunto set my hand.

JOHN H. LORIMER.

Witnesses:

RICHARD S. CHILD, Jr.,

ERNEST HOWARD HUNTER.