L. W. Boynton,

Wool-Washing Machine,

No. 8,287. Patented Aug. 12. 1851.

Fig: 1.

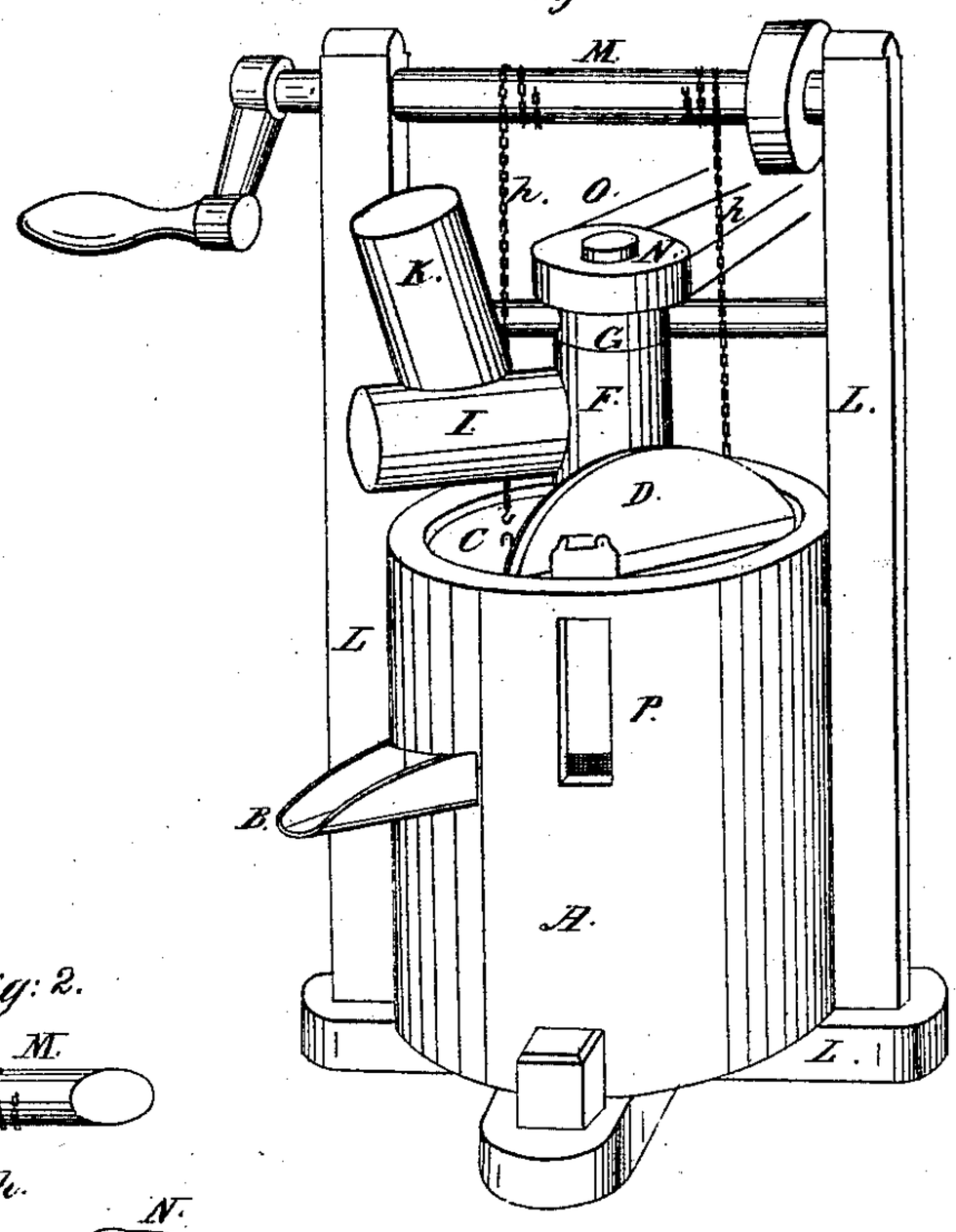


Fig: 2.

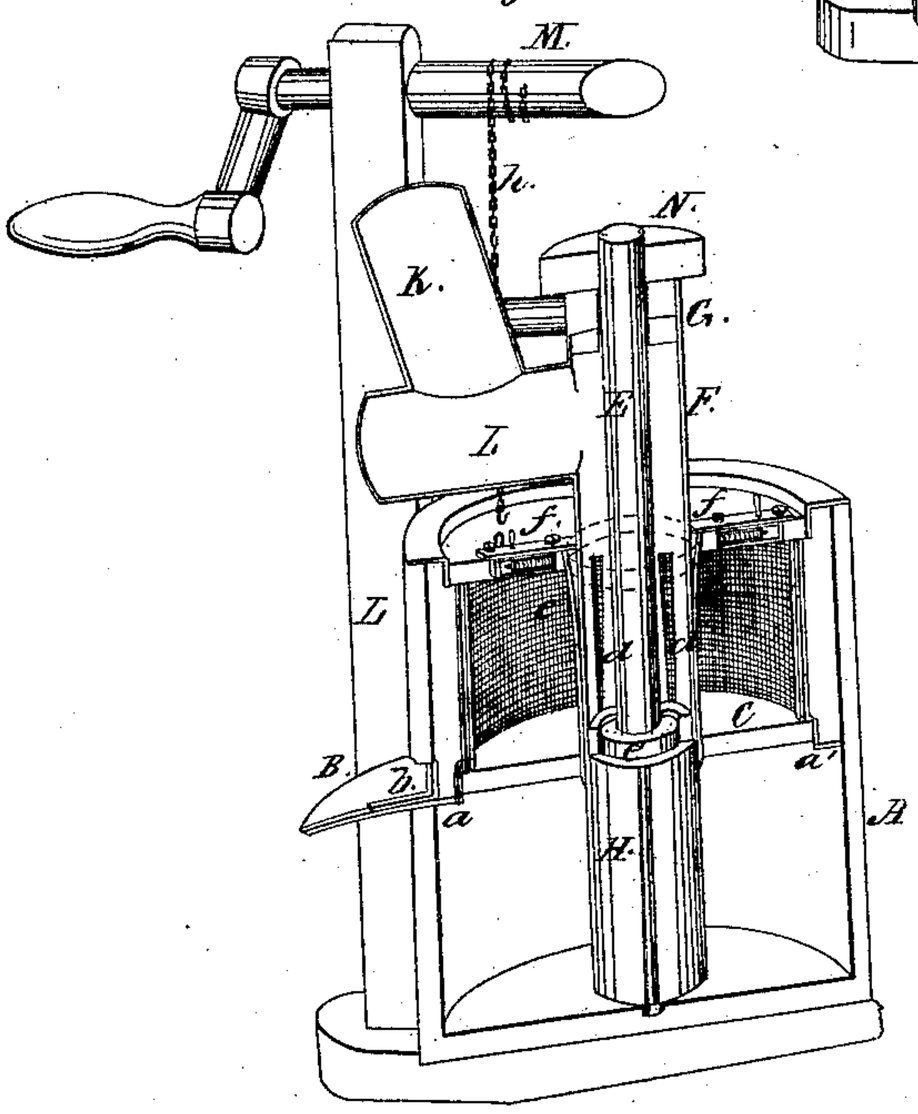


Fig: 4.

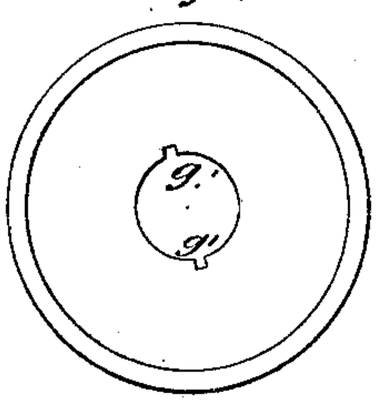
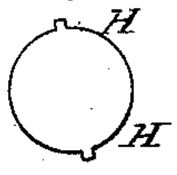


Fig: 3.



UNITED STATES PATENT OFFICE.

L. W. BOYNTON, OF SOUTH COVENTRY, CONNECTICUT.

MACHINE FOR CLEANSING WOOL.

Specification of Letters Patent No. 8,287, dated August 12, 1851.

To all whom it may concern:

Be it known that I, LEANDER W. BOYNTON, of South Coventry, in the county of Tolland and State of Connecticut, have invented a new and useful Improvement in Machinery for Cleansing Wool, &c.; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, which make a part of this specification, in which—

Figure 1, is a perspective view of the machine, showing its external structure and arrangement. Fig. 2, is a perspective view of a vertical section of the machine, showing the internal structure and arrangement of the several parts. Fig. 3, is a view of a cross section of the lower part of the shaft, showing the longitudinal flanges. Fig. 4, is a plan view of the bottom of the tub, showing the spaces into which the longitudinal flanges fit.

My improvement consists in the use of a cylindrical tub, made of wire cloth, or other suitable material, in a cylindrical vat, so that it may be raised and lowered at pleasure; and caused to revolve, so as to dry the wool, &c., after it has been soaked in proper liquor in the bottom of the vat; and, rinsed by clean water conveyed into the tub by a suitable pipe, the whole being done without handling the wool, except to put it into the tub, until it is entirely finished, and this without wasting the liquid use.

I make the cylindrical vat, A, Figs, 1, and 2, of wood, cast iron, or any other suitable material, water tight, about two diameters in height. About midway between the top and bottom, I fit a circular trough, as seen at *a*, and *a'*, Fig. 2, into which the cleansing liquid, as it comes out from the wool, will fall, and pass down through a gate-way, at *a*, into the lower part of the vat, to be used again. And the water which is used for rinsing the wool will fall into the same trough, but by sliding the gate *b*, in, it will close the passage to the lower part of the vat, and the water will pass off from the spout, B.

I make the cylindrical tub, C, Figs. 1, and 2, with a solid bottom, as seen, in section, in Fig. 2, and I make the sides of wire cloth, as seen in Fig. 2, perforated sheet metal, or any other suitable material, of such diameter as to pass freely, though closely, within the circular trough, *a* and *a'*, as represented in Fig. 2. In the top of this tub, I make one or more doors, as seen at D, Fig. 1, through which to put in, and take out, the wool, &c. Perpendicularly through the center of this cylindrical tub, I pass a shaft, E, Fig. 2, which rests in a proper bearing in the center of the bottom of the vat, A, passing through the center of the tub, C, and also through the center of a pipe, or tube, F, Figs. 1, and 2, and the upper end is secured in a proper bearing, at G, all as represented, in section, in Fig. 2.

The lower part of the shaft, E, is made large to correspond with the size of the tube, F, as high up as the trough, *a* and *a'*, and has longitudinal flanges on it, as seen at H, Figs. 2, and 3, which fit into appropriate grooves in the bottom of the tub, C, as seen in Fig. 4, at G, (or any other suitable device,) to cause the tub to revolve with the shaft. Above the trough the shaft is made small, as seen at E, Fig. 2.

I make the tube, or pipe, F, of sheet metal, or any other suitable material, of the same external diameter as the lower end of the shaft, and so that its lower end may rest on the shoulder, or bearing of the shaft, as seen at *c*, Fig. 2, while it extends upward some distance above the top of the vat, A, (and is steadied by the bearing, or head, G, Fig. 2,) where it receives a water pipe I, and also an air pipe K, all as seen in Figs. 1, and 2. In the lower part of this pipe, or tube, F, (below the top of the vat,) I cut longitudinal slots, or spaces, as seen at *d*, and *d*, Fig. 2, (or perforate it with small holes, as may be thought best,) to allow the water to pass out of this tube, F, in to the tube C, when the tub is raised to the upper part of the vat, as seen in Fig. 2, for the purpose of rinsing the wool, as hereafter explained.

To the lower, or large, part of the shaft, E, I attach two bars, or rods, *e*, and *e*, Fig. 2. Near the upper ends of these rods, and nearly as high as the top of the vat, I connect them by a circle or band, (represented by dotted lines,) which passes around the tube, F, loose enough to turn freely, while the tube is stationary. And in the upper head of the tub, C, I fit two dogs, spring slides, or catches, *f* and *f*, Fig. 2. When these dogs, *f* and *f*, are forced, by their

springs, over the upper ends of the bars, or rods, *e*, and *e*, the weight of the tub, C, is sustained by them wholly.

Having made the various parts of the machine, or apparatus, I fit the vat, A, in a suitable frame, as L, L, L. In this vat I place the tub, C, with the shaft, E, tube, F, &c., as represented in Fig. 2.

In the top of the frame I fit a windlass, M, by means of which, and chains, *h*, and *h*, which connect with the tub, C, I raise, or lower the tube, at pleasure.

I put the liquid for cleaning the wool into the lower part of the vat, A, (below the trough, *a*, and *a'*,). I put the wool into the tub, C, at the doors, or openings, D, Fig. 1; draw back the dogs, or slides, *f*, and *f;* and by means of the windlass, M, and the chains, *h*, and *h*, I let the tub, C, down into the liquid in the bottom of the vat, A, where it may remain stationary, or may be moved up and down by the windlass. I then draw back the slide gate, *b*, to the position seen in Fig. 2, so as to open a passage from the trough, *a*, and *a'*, as seen at *a*, to the lower part of the vat, (the upright part of the slide gate, *b*, will then close the passage into the spout, B, as seen in Fig. 2.) I then, by the windlass, raise the tub to the top of the vat, and unhook the chains from the top of the tub, C; and, by means of the pulley, N, and the band, O, Fig. 1, I give a rotary motion to the tub, C, which, by its centrifugal force, will throw all the liquid out of the wool against the inside of the vat, so that it will run down into the trough, *a*, and *a'*, and pass to the lower part of the vat, through the gate-way at *a*.

To rinse the wool, I push in the gate, or slide, *b*, so as to close the gate-way at *a*, and open that at the spout, B. I then let in the clean water through the pipe, I, which will pass into the tub, C, through the slots, or spaces, *d*, and *d*, so as to pervade every part of the wool in the tub, (care should be taken to have the water pass into the pipe, I, a little faster than it passes out of the slots, *d*, and *d*, so that the pressure may be, comparatively, equal throughout the whole extent,) while the tub is revolving, and throwing out the water, by its centrifugal force, against the sides of the vat, whence it runs down into the trough, *a*, and *a'*, and passes off at the spout, B.

When the wool has been sufficiently rinsed, I stop the flowing of the water in the pipe, I, and continue the revolving motion of the tub until the wool is comparatively dry. And, should it be deemed best, a current of hot, or cold, air may be forced into the tub, C, through the pipe K, to dry the wool more effectually; in which case the slide, P, Fig. 1, must be opened to let the air out of the vat.

The rotary motion of the tub, C, should commence very slow, and increase very gradually to its maximum, and at the conclusion, should decrease gradually until the motion is very slow, before it is stopped. For this reason I would recommend the use of a pair of plain cone pulleys on which the bands may be varied regularly each way, to increase, and to decrease the revolving motion of the tub.

Should it be found, in any case, that the wool, by the centrifugal force, is pressed too hard against the inner surface of the tub, so as to prevent the moisture from escaping, small pins may be inserted through the bottom of the tub and pass upward to the top of the tub (at a suitable distance from the wire cloth, or perforated metal,) so as to keep the wool from coming directly in contact with the sides of the tub, and thereby allow a free escape for the water, &c.

My improvement is also designed for, and, is peculiarly applicable to, coloring wool (and other similar substances). I put the wool into the tub, C, the same as for cleansing; and put the coloring liquid in the bottom part of the vat, A, so that the wool may, as often as desired, be raised out of the liquid, the liquid thrown out of the wool, (returning to the lower part of the vat again, as first described,) the wool aired with either hot, or cold air, as before described, and returned to the coloring liquid again. This is deemed a very important part of the usefulness of my apparatus.

The mechanical means, by which the tub, C, is lowered and raised, may be varied at pleasure, as by using one chain through the center of the shaft, or otherwise.

The advantages of my improvement, over all methods heretofore used, or known, consist, in part, in so constructing and arranging the several parts of the apparatus, that the wool does not need to be handled, at all, in the process, except to put it into the tub, at the beginning, and, to take it out, when it has been perfectly cleansed and dried; while, by all other processes it must be handled over several times during the process of cleansing. And, in, that the wool may be put into the tub in a loose, free, and open state, and remain so during the whole process, (except so far as it is affected by the presence of the water, and the pressure of the centrifugal force,) while by other methods, the wool is stirred about in the vat to bring the different parts in contact with the liquid, by which means it is often drawn into knots, and matted together, more or less, by the operation, so that it cannot be equally cleansed. And by my operation, the wool being dried in the tub, C, entirely by the centrifugal force, or by the use of hot, or cold, air, it will be in a much better state for use, as well as being much more equally cleansed. And as it is all done at one opera-

tion, as above stated, much time and labor are saved, and, consequently, much expense.

I do not claim either of the parts of the apparatus, as such, as my invention; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the tub, C, with the shaft, E, and tube, F, when these are combined with the vat, A, (with its trough, *a*, and *a'*,) and the whole is constructed, arranged, combined, and operated, substantially, as herein described, for the purpose of cleansing, or for coloring wool, and other analogous substances, as herein described.

L. W. BOYNTON.

Witnesses:

R. FITZGERALD,

J. D. WILLARD.