W. H. Churchman,

Washing Mach.

No. 111,176. Patented Jan. 24, 1871.

Fig. 1.

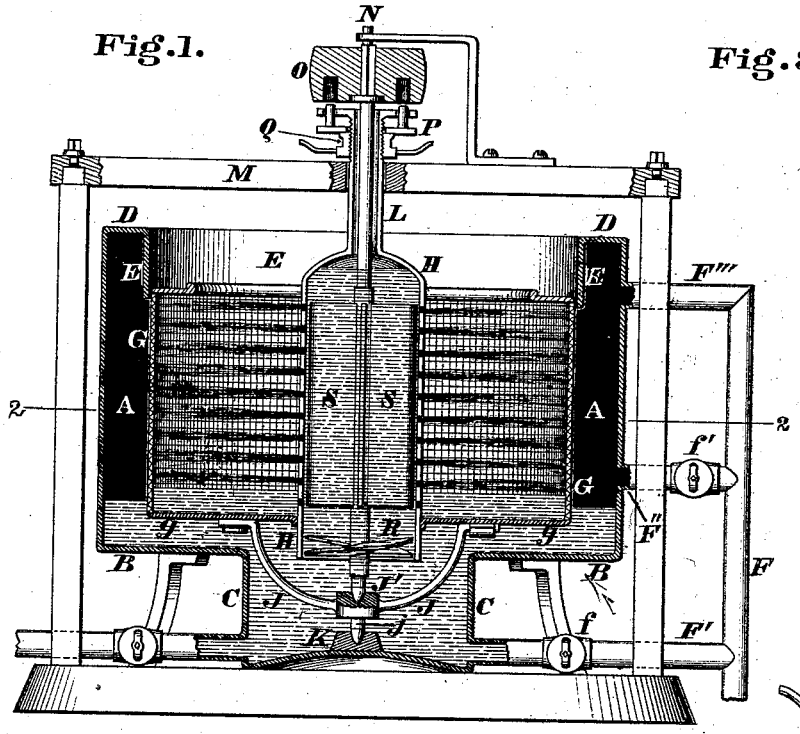


Fig. 3.

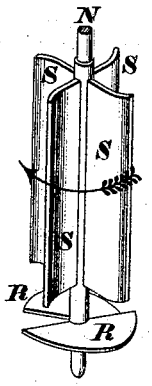


Fig. 4.

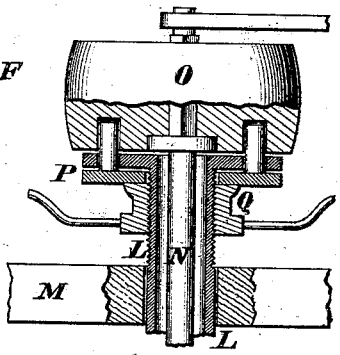


Fig. 5.

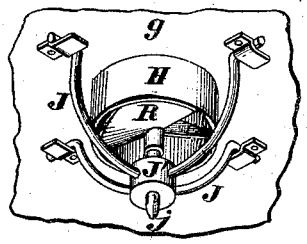
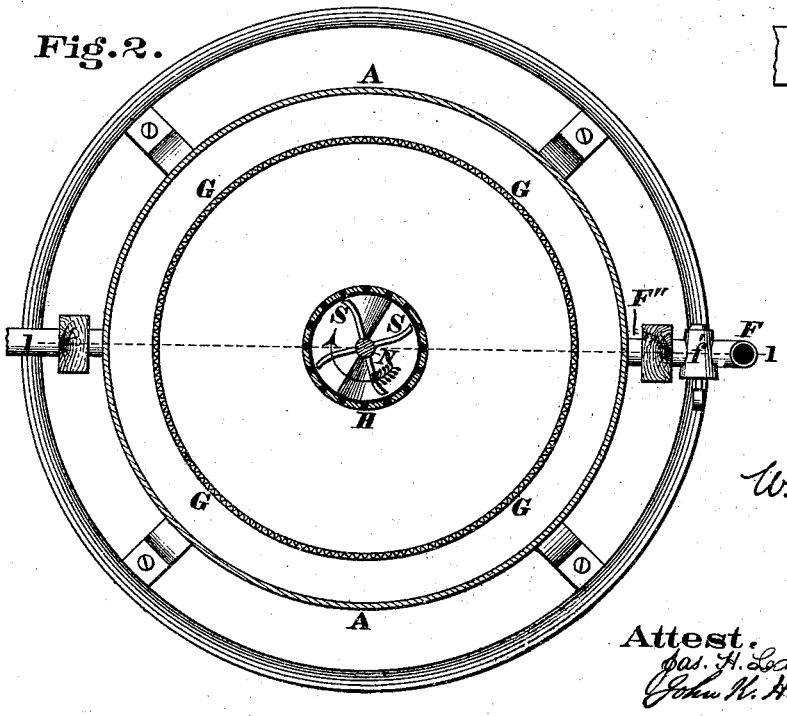


Fig. 2.



W. H. Churchman
INVENTOR.
By Knight Bros
Attys

Attest.
Jas. H. Lowman
John K. Harris

UNITED STATES PATENT OFFICE.

WILLIAM H. CHURCHMAN, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN SCOURING, WASHING, AND WRINGING MACHINES.

Specification forming part of Letters Patent No. **111,176**, dated January 24, 1871.

To all whom it may concern:

Be it known that I, WILLIAM H. CHURCHMAN, of Indianapolis, Marion county, Indiana, have invented a new and useful Scouring, Washing, and Wringing Machine, of which the following is a specification.

This invention is an improvement upon the well-known "centrifugal wringing-machine," whereby such machine is rendered capable of performing the several offices of scouring, washing, and rinsing, as well as that of wringing merely, and is adapted to general use in factories, dye-houses, hotels, public laundries, and other public institutions for the purposes of cleansing and drying all kinds of textile fabrics and materials.

The essential parts of the ordinary wringing-machine above alluded to are, first, a cylindrical metallic basket or receptacle for the clothing or other articles to be wrung out, which basket is made to rotate rapidly about a vertical axis by steam or other power, for the purpose of expelling, by centrifugal force, the water or other detersive fluid with which said articles have been saturated in the process of cleansing; and, second, an inclosing tank or case, with a bottom outlet, for the purpose of receiving and carrying off such detersive fluid after its expulsion through the perforations of the basket.

My improvement upon said machine consists in combining with it a centrifugal washing device whose main features are as follows: First, a perforated cylinder of equal height with the basket and about one-fourth its diameter is planted vertically in the center of the bottom of the latter, and made to communicate interiorly with the water-space in the tank below the basket, through an extension of its own length, to the depth of several inches below the bottom of said basket, which extension, however, is without perforations; second, within said cylinder is placed a mechanical contrivance for elevating water or other fluid substance, and projecting it, by centrifugal force and at a high velocity, through the perforations into the interior of the basket, where it percolates through the articles to be cleansed, and, passing through the interstices of the basket, returns to the bottom of the tank, to be again elevated and projected as before, thus producing a circulation of detersive fluid which may be continued at will; third, certain mechanical arrangements are introduced, by which the washing device may be operated independently with the basket at rest, or the latter made to rotate for the process of wringing, at the discretion of the operator, thus providing in one apparatus for the several successive processes involved in scouring, washing, &c., without the handling of the articles until ready to be transferred to the drying-room. The whole device is preferably constructed of iron or other suitable metal, those parts liable to corrode by contact with the fluids being suitably plated or enameled.

In the drawings, Figure 1 is a vertical section of the machine taken at the line 1 1. Fig. 2 is a horizontal section of the same at the line 2 2. Fig. 3 is a perspective view of the centrifugal water elevator and projector. Fig. 4 is an enlarged sectional view showing the clutch coupled to the driving-pulley. Fig. 5 is a perspective view showing the manner of attaching the toe or spindle.

A is the inclosing tank or case with a central depression or well, C, in its floor B for the purpose of collecting the water, &c., to be elevated by the pumping device and affording room for the latter, together with the support of the basket, without unduly increasing the capacity of the water-space. The inwardly-projecting ledge D and dependent verge E are for stiffening the tank, and at the same time preventing the splashing over of the water, &c. F′ and its continuation F form a discharge-pipe for emptying the tank A. The said pipe F′ is provided with a stop-cock, *f*, for retaining the water, &c., during the cleansing process. The branch pipes F″ and F‴, connecting the tank with the extension of the discharge-pipe F, are overflows for carrying off the water during the rinsing process, the water being introduced in a continuous stream by an appropriate supply-pipe communicating with the well. The valve *f′* is for closing the lower overflow, F″, when desirable.

G is the rotating basket, with open-work periphery and solid bottom *g*, for containing the articles to be cleansed.

H is a perforated fountain-cylinder, with closed top and open bottom, attached to the floor of the basket at its center, and extending a few inches below the same, which extended part is without perforations, as mentioned in the general description.

J is a spider or four-armed support, bolted or otherwise secured to the bottom of the basket and sustaining the same.

Projecting from the bottom of the hub J′, from which the arms spring, is a toe or spindle, *j*, which rests in a step, K, in the bottom of the tank-well. The top of said hub is hollowed to serve as a step for sustaining the lower end of the shaft of the water elevator and projector, hereinafter to be described.

Screwed firmly into the closed top of the fountain-cylinder H is a hollow shaft, L, which is journaled in the bridge-piece M, and surmounted by a firmly-attached driving-plate, which forms a portion of the clutch P, for attaching said hollow shaft, and consequently the basket G, with its fountain-cylinder H, to the driving-pulley O, when it is desired to rotate the basket and its contents for wringing.

N is a shaft, which carries the water-elevator R and projector S, that revolve within the fountain-cylinder H, and, with the latter, constitute the washing device proper, referred to in the general description. The lower end of said shaft N rests in a step or cavity in the top of the hub J′ of the spindle, and its upper end is journaled in a suitable support surmounting the bridge-piece M. The driving-pulley O is firmly attached to said shaft N, and rotates it either separately or in conjunction with the basket when attached by the clutch P, as before stated.

The water-elevator R is composed of one or more spiral blades, attached to the shaft N at the proper point for rotating them within the unperforated extension of the fountain-cylinder H.

The projector S is constituted of a series of vertical or slightly spiral blades, so attached to the shaft N as to cause them to be rotated within the perforated portion of the fountain-cylinder H. Its office is to project the water or other detersive fluid elevated by the screw-pump R through the perforations of the fountain-cylinder into the body of the basket and among the articles to be cleansed. This is done with greater or lesser force, according to the speed at which the machine is run, its effective speed being about one thousand revolutions per minute.

The clutch P is composed of the driving-plate attached to the tubular shaft L, a movable plate with two or more dowel-pins, which slide up and down the shaft L, the pins occupying guide-holes in said driving-plate, and the screw sleeve-nut Q, by which the sliding plate with its dowel-pins is elevated or depressed. When said plate is depressed, the shaft N, with its attachments, is rotated independently for the purposes of scouring, washing, and rinsing. When it is desired to attach the basket to the driving-pulley for wringing, the sliding plate is elevated by the sleeve-nut until the pins enter appropriate sockets in the under side of the driving-pulley.

In the bottom of the tank A may be placed a steam pipe or coil, with suitable connections, for the purpose of heating the water, &c., when desired.

The operation is as follows:

First. The scouring or washing fluid being let into the tank in sufficient quantity, and the articles to be cleansed placed in the basket, the washing device is put in motion with the basket at rest.

Second. After said fluid has been passed and repassed through the articles for a sufficient length of time, it is drawn off through the discharge-pipe. The basket is then attached to the driving-pulley, as described, and rotated for a few moments to wring out what remains in the articles being cleansed.

Third. For rinsing, the basket is detached and the washing device again set in motion with a stream of water flowing into the tank-well through the supply-pipe and out of the machine through either of the overflows, at the discretion of the operator. Upon the completion of this process the water is cut off, the tank emptied, and the basket rotated as before for the final wringing.

I claim as new and of my invention—

1. The combined water elevator and projector N R S, operating within a hollow cylinder, H, substantially as described.

2. The combination of the perforated fountain-cylinder H and the wringer-basket G, as described, for the purposes set forth.

3. The described arrangement, one within the other, of the combined water elevator and projector N R S, and the fountain-cylinder H, with its hollow shaft L, the whole constituting, in conjunction, the scouring and washing device of my machine.

4. The combination, substantially as set forth, of the centrally-disposed washing device H L N R S with the centrifugal wringing-machine.

5. The described arrangement of the hollow shaft L, screw-threaded sleeve or nut-clutch Q P, and socket-pulley O, or devices substantially equivalent, for readily changing from a scouring, washing, and wringing device to a wringer, or the reverse, at the will of the operator.

In testimony of which invention I hereunto set my hand.

W. H. CHURCHMAN.

Witnesses:

GEO. H. KNIGHT,

H. W. BALLARD.