

(No Model.)

2 Sheets—Sheet 2.

R. HOFFHEINS.
SCRUBBING MACHINE.

No. 550,971.

Patented Dec. 10, 1895.

Fig. 4.

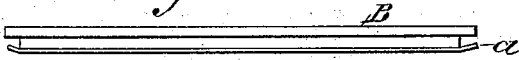


Fig. 5.

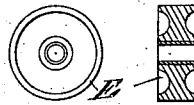


Fig. 6.

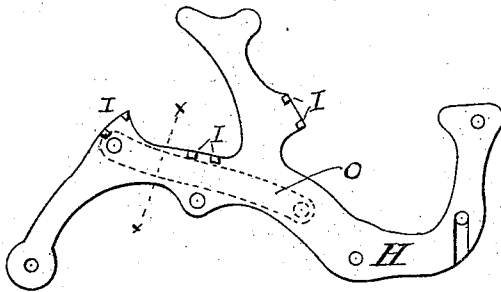


Fig. 7.



Fig. 8.

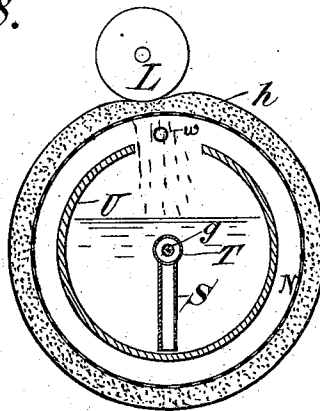


Fig. 9.

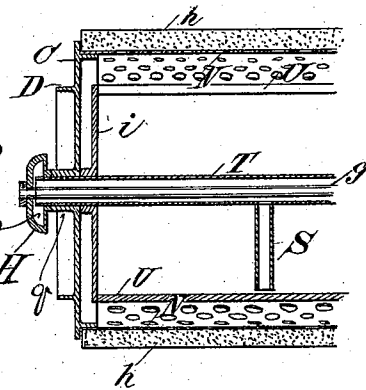


Fig. 10.



Witnesses
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UNITED STATES PATENT OFFICE.

REUBEN HOFFHEINS, OF CHICAGO, ILLINOIS.

SCRUBBING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 550,971, dated December 10, 1895.

Application filed February 18, 1895. Serial No. 538,888. (No model.)

To all whom it may concern:

Be it known that I, REUBEN HOFFHEINS, of Chicago, in Cook county, in the State of Illinois, have invented new and useful Improvements in Scrubbing-Machines; and I do hereby declare that the following is a full and accurate description of the same, reference being had to the accompanying drawings, wherein—

10 Figure 1 is a plan view of my machine. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical longitudinal section of the same. Fig. 4 represents the method of packing the tank-lid. Fig. 5 is an elevation and a section
15 of a bearing-wheel. Fig. 6 is a side elevation of one side frame. Fig. 7 is a transverse section of the same on line *x x*, Fig. 6. Fig. 8 is a transverse section of the mop-cylinder. Fig. 9 is a vertical longitudinal section of the
20 same. Fig. 10 is a transverse section of water-pipe in the mop-cylinder.

I am aware that machines have been made for the purpose of scrubbing floors and that all of them employ brushes in one form or
25 another to scrub the floor and that they have receptacles for the necessary water and means for taking up again the surplus water. Therefore I do not claim, broadly, either of those features; but I believe the improve-
30 ments which I have invented are essential to a satisfactory and successful machine.

That the following description and claims may be clearly understood I will first briefly
35 enumerate the points which I believe to be novel in my machine.

First. The side frame is in one piece, preferably of cast metal, and it carries fixed provision for bearings of all the working parts
40 of the machine and also internal water-ways for the passage of water from one tank to another.

Second. The water-tanks to supply water to the scrubber and the tank to receive mop-water are in communication, so that the same
45 water may be employed over and over.

Third. The distributing water-tank is provided with a settling-chamber to receive the solid matters removed from the floor with the
50 mop water.

Fourth. The mop is longer than the scrubber, so that it does not leave behind it streaks of loose water.

Fifth. The face of the mop-cylinder to which the mop is attached is reticulated, being preferably made of perforated metal, and the
55 squeezing-roller squeezes the mop directly upon the perforated cylinder, thus dispensing with one squeezing-roller.

Sixth. The propelling-handle is reversible, so that the scrubber may be operated from
60 either side.

There are other subordinate points of improvement which will be described and claimed, but which it is not necessary to enu-
65 merate here.

The frames H, I have heretofore made of cast-iron galvanized, but they may be made of any other proper material which will with-stand the action of water. Cast-iron covered
70 with zinc and known as "galvanized" appears to be preferable, both for cheapness and adaptability.

The frames H are so fashioned that they embrace within themselves pivots for the arms of the bearing-wheels E F, pivots for
75 the mop-cylinder C, points of attachment for the bail J of the handle and position racks I for the same, bearings for the scrubber G, point of attachment for the squeezing-roll L, and points for attaching the water-tank A and
80 the water-way O.

The scrubbing-brush G and the mop-cylinder C are driven by friction and caused to revolve in direction opposite to the direction of advance, so that neither scrubber nor mop
85 simply roll upon the floor, but actually and forcibly rub thereon as they pass over it. The required friction is secured by the bearing-wheels E F, which run upon the floor and against the spindles of the brush and mop,
90 respectively, and cause them to revolve in a direction opposite to that of advance. The amount of this driving-friction is determined, primarily, by the weight of the machine, but is capable of being increased by the operator
95 by bearing down upon the propelling-handle.

I find it advantageous to introduce some elasticity in the combination of frictional driver and driven, and this I secure in a highly-satisfactory manner by means of wheels
100 E F, which are made of solid elastic material, like vulcanized rubber, molded upon proper pieces of metallic tubing to form wearing-surfaces for the pivot-pin. The wheels E F are

also mounted at the free ends of arms *k k*, which are pivoted at *Q Q* to the frame *H*, so that said wheels are free to rise and fall as the pressure upon them may be increased or diminished.

The water-way *O* is usually made within the frame *H* by casting the same with an open groove, which is afterward closed and made to constitute a tube by soldering a piece of tin or other non-corrodible sheet metal over said groove, as shown in Fig. 7; but said water-way may be made by coring or by attaching a separate tube. At one end said water-way communicates with the mop-tank by means of the tube *T* and at the other end it communicates with the water-tank *A* by means of the short tube *V*, which may be provided with a stopper or with a gate, so that it may be closed at the will of the operator, and then none but clear water will pass to the scrubber.

At each side of the machine there is a frame *H*. Said frames are duplicates, except that they are right and left.

The scrubbing-brush *G* is an ordinary cylindrical brush, having its pivots journaled in the frame *H*, and to facilitate the removal of said brush I prefer to make said journal or pivot bearings in slots *f*, although this is manifestly a convenience and not a necessity. The wheel *F* bears against the shaft of the brush *G* and causes it to revolve when said wheel revolves.

The water-tank *A* is located above the brush *G* and is provided with a concave bottom to set over the brush like a saddle. A row of holes *m* are provided along the front part *n*, through which water is discharged upon the brush. These holes are closed and controlled by the cylindrical eccentric valve *Z*, which may be operated by the hand-wheel *Y*. Packing-rings *p* are placed on the spindle of said valve within the tank and between said valve and the wall of said tank to prevent leakage at the hole through which the valve-spindle passes.

The tank *A* has a cover *B*, hinged at *b*, and as it is necessary that said cover shall fit tightly and not permit water to slop out as the machine is moved backward and forward I put a packing-strip *a* on the edges of the cover *B*, which packs the joint securely when the cover is forced down to its place.

At the rear side of the brush the tank *A* has a deep depression *W*, into which the water-pipe *V* discharges soiled water from the mop-tank, and said depression *W* constitutes a settling-chamber to receive and retain the solid matters brought over with the water from the mop-tank.

The mop, which follows after the scrubber and removes the free water from the floor, consists of a cylinder of reticulated material through which the water will pass freely as squeezed out of the mop by the squeezing-roll. Heretofore I have made this cylinder of perforated non-corrodible metal *N*, and

the same is covered with a spongy fibrous covering *h*, of some material capable of absorbing quickly and in considerable quantity the water which may be left free upon the floor by the scrubber *G*. The cylinder *N* is supported by two heads *C*, which may be cast integral with a projecting circular ledge *D*, which constitutes a friction-surface for the driving-wheel *E*. It has also a tubular hub *g*. Within said mop-cylinder a tube *T* extends axially from end to end, and at each end it enters the water-way *O* and may constitute the real axle upon which the mop-cylinder revolves. A tie-rod *g* passes through the tube *T* and projects through the frame *H* at each end. A nut and washer at each end outside said frame enable said rod to tie the frames *H* together.

A mop-water tank *U* is hung upon the tube *T* within the mop-cylinder *N*. Said tank is open along its top, and directly above said opening the squeezing-roll *L* is placed to squeeze out the water which is taken up in the mop-cover *h*, and said water runs down through the perforations of the cylinder *N* through said opening into the tank *U*.

The pipe *T* has one or more openings in its side, through which water will run away from the tank *U*, through the water-way *O* or its equivalent, to the tank *A* when the water-level in the tank *U* becomes higher than the water-level in the tank *A*.

If it is preferred to draw water from the bottom of the tank *U* or from any point below the axis, the pipe *T* may be extended to such point by means of the pendent portion *S*.

The squeezing-roller *L* is carried at the ends of two springs or elastic supports *M*, the fixed ends whereof are fastened to the frame *H*, as at *r*, and I find it convenient to hold said supports in place by means of a common screw and a common washer *R*.

In front of the scrubbing-brush *G*, I place a pendent apron *d*, attached to the tank *A*. This apron may be made of flexible material or may be rendered flexible by a hinge or attaching-strip *e*. This is to prevent splashing forward of the water thrown off from the brush *G* as it revolves.

The handle-bail *J* is pivoted to the frame *H* at *t*. It is preferably composed of an elastic wire rod, like steel, and is held in place by its own elasticity. The position racks *I* are so located that the handle may stand at convenient angles for use or to support the handle upright when the machine is not in use. When the handle is to be changed from one position to another, the bail springs apart sufficiently to permit its passage into or out of the racks *I* without trouble.

A socket *K*, rigidly fixed to the middle of the bail *J*, serves to receive an end of an ordinary wooden stick or handle with which to manage and operate the machine.

When the machine is to be operated, water is poured into the tank *A*. When its surface rises to the level of the tube *T*, it will over-

flow into the tank U and fill that to the level of the water in the tank A.

Water which is discharged on the brush G through holes *m* will be mostly taken up again by the mop and returned to the tank U, and as the discharge is continued from tank A and water is continually being returned to the tank U it follows that there will be a constant disturbance of water-level between the two tanks, and therefore water will be continually passing from tank U to tank A, and thus the same water will be used over and over until the unrecovered portion has so reduced the quantity in the reservoirs that it will no longer flow over the arch in tank A from the chamber W to the discharging-chamber *n*. A fresh supply will then be required. A hole *w* in the head of cylinder N serves as a convenient means for emptying the tank U, when desired.

I claim as new—

1. In a scrubbing machine a rotatable brush, a supply tank with discharge openings to supply water to the floor, a rotatable mopping cylinder to mop the floor, a receiving tank within the mopping cylinder and a water way or channel to conduct water from one of said tanks to the other.

2. A scrubbing machine having a rotatable brush driven by the supporting wheels, a supply tank located above said brush, a perforated mopping cylinder covered with absorbing material, a stationary tank within the mopping cylinder and waterways to connect both tanks.

3. In a scrubbing and mopping machine, in combination with a revolving brush and a revolving mop a supply tank and a receiving tank, one or more water ways connecting both tanks, and means to open and close said water way at the will of the operator.

4. A scrubbing machine provided with two water tanks, combined with the side frames H, provided with an internal water-way O, to connect said tanks as set forth.

5. In a scrubbing machine, in combination with a revolving brush and a revolving mop, a distributing water tank, and a receiving tank for the water taken up by the mop, and a connecting water way, whereby the mop water may be re-distributed from the distributing tank.

6. In a scrubbing machine, a cylindrical revolving scrubbing brush, a distributing tank A, having a concave bottom to cover said brush within said concavity, a discharge chamber *n*, provided with water exits and a

valve, and a settling chamber W, on the other side of said concavity, combined with a tank to receive the mop water, and a water way to connect said mop water tank with said settling chamber, whereby the water may be reused, as set forth.

7. In a scrubbing machine, a revoluble mop cylinder N, provided with a mop water tank within it, a perforated, central tube T extending out through the hubs of said cylinder, a water way in connection with the end of said tube and a distributing tank A, also in connection with said water way, for the purpose set forth.

8. In a scrubbing machine, a mop cylinder having within it a tank for mop water, a central perforated tube T provided with a pendant tube S, a water-way in connection with said tube and a distributing tank also in connection with said waterway, whereby, water discharged from said mop cylinder will be taken up from the bottom of the same as set forth.

9. In a scrubbing machine, a scrubbing brush G, a mop cylinder N, a distributing tank all connected by the side frames H, combined with the elastic bearing and friction wheels E, F, in frictional contact with the cylinders of said brush and mop respectively, as set forth.

10. In combination with the tank and operative parts of a scrubbing machine, the side frames H provided with pivot bearings for the arms *k*, the brush G, the mop cylinder N, the handle bail J and position racks I as set forth.

11. In combination, the revolving brush, the tank A, provided with the concave bottom and the compartments W and *n*, said compartment *n*, being provided with water exits *m*, and the eccentric cylindrical valves Z, substantially as set forth.

12. The mop cylinder N of reticulated metal, the internal tank U for mop water and the squeezing roll L, mounted upon an elastic support substantially as and for the purpose set forth.

13. In combination with the mop cylinder N, the interior tank U, the squeezing roll L, the elastic supports M, and the side frames H, H, to which said supports are connected as set forth.

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Witnesses:

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