(No Model.) 2 Sheets—Sheet 1.

J. ZIV.

SCRUBBING MACHINE.

No. 454,633. Patented June 23, 1891.

Fig. 1.

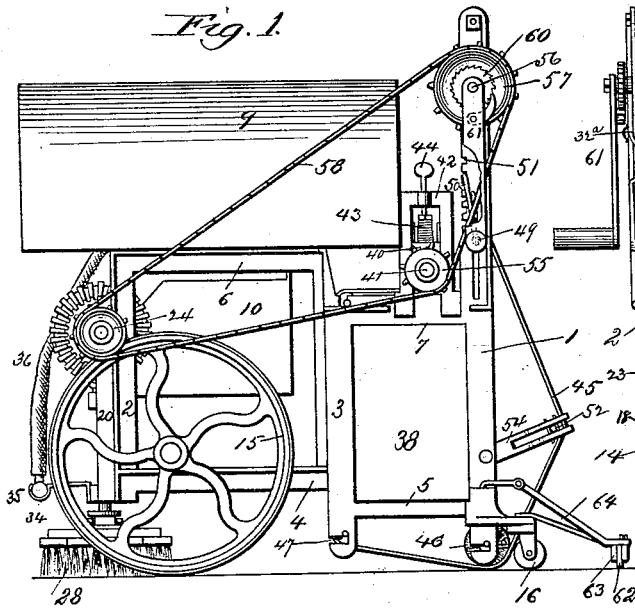


Fig. 2.

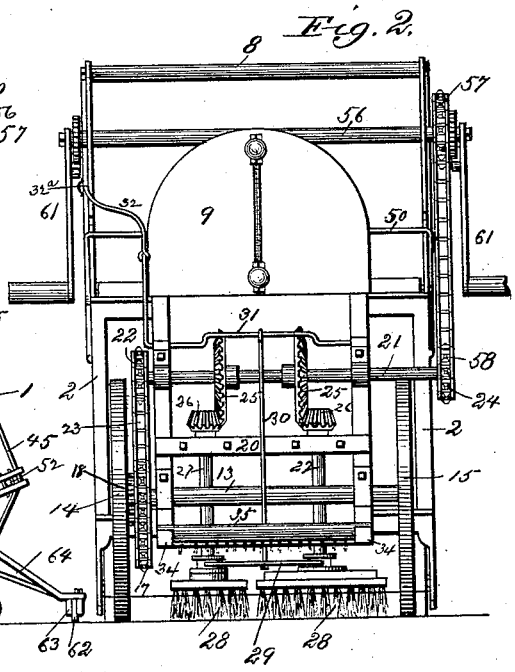
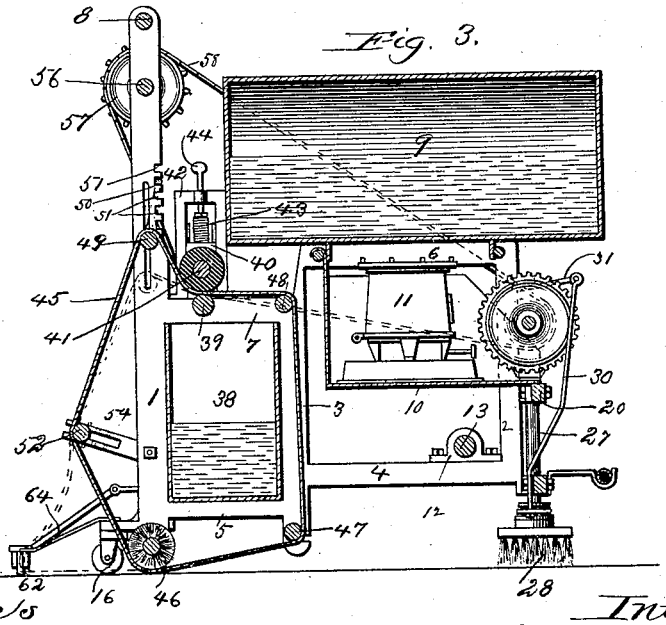


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

J. ZIV.

SCRUBBING MACHINE.

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Fig. 4.

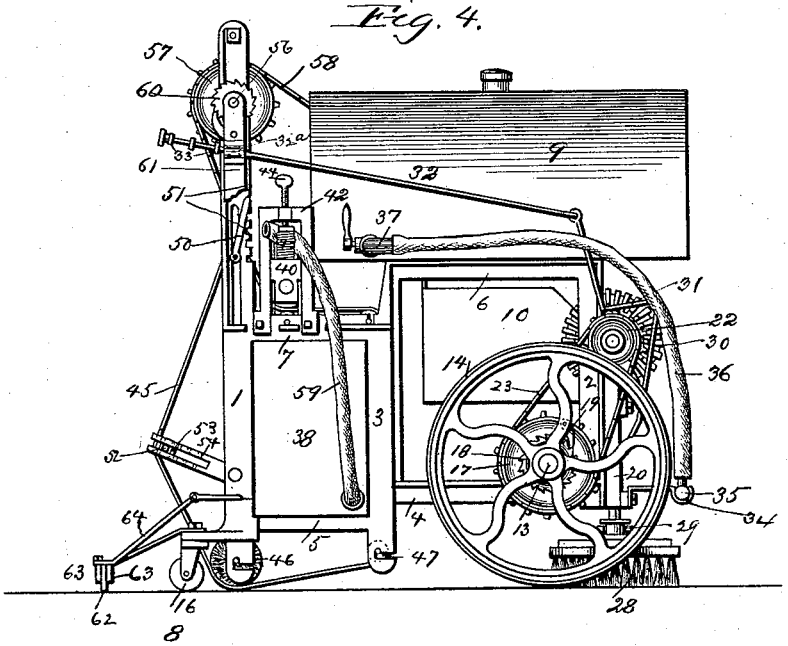


Fig. 5.

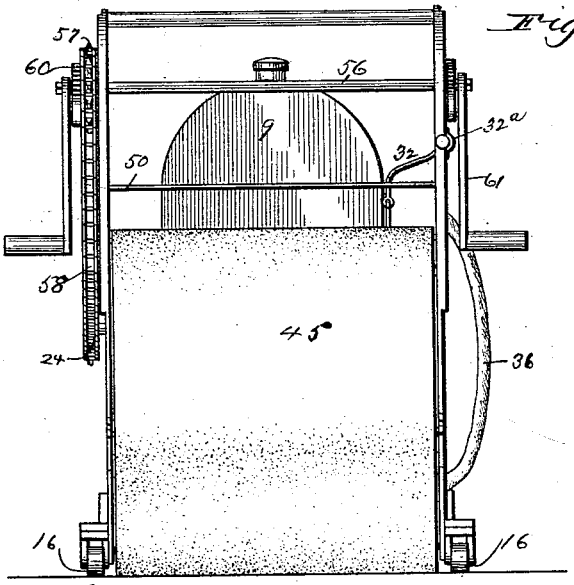
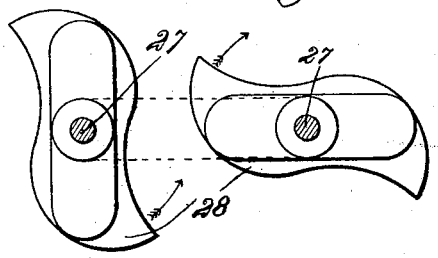


Fig. 6.



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UNITED STATES PATENT OFFICE.

JONAS ZIV, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NATHAN DAVIS, OF SAME PLACE.

SCRUBBING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 454,633, dated June 23, 1891.

Application filed November 11, 1889. Serial No. 329,942. (No model.)

To all whom it may concern:

Be it known that I, JONAS ZIV, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Scrubbing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to machines for automatically scrubbing and mopping the floors of halls and apartment-rooms; and it has for its object to provide such a machine to be moved over the floor by hand, whereby it will sprinkle water upon the floor, scrub the same, and wipe or take up the dirty water from the floor and deposit it in a receptacle attached to the machine for that purpose, and in which the brushes and mops can also be operated while the machine remains stationary for thoroughly scrubbing more dirty spots; and with these objects in view my invention consists of the novel devices and combinations of devices hereinafter described, and specifically claimed.

In the accompanying drawings, Figure 1 represents a side elevation, Fig. 2 a rear elevation, and Fig. 3 a longitudinal vertical section, of the machine; Fig. 4, an elevation of the opposite side of the machine; Fig. 5, a front elevation of the same; and Fig. 6 is a plan view of the rotating scrubbing-brushes detached.

Corresponding referential characters in the several figures of the drawings designate like parts.

The main frame is composed of two side frames, each consisting of a rear standard 1, front standard 2, intermediate standard 3, bottom horizontal bars 4 and 5, and upper horizontal bars 6 and 7, and these two side frames are connected by a series of cross-rods and by handle-bar 8 so as to be rigid with each other. Upon this frame is mounted a boiler 9, and below it upon the shelf 10, rigid with the frame, is placed an oil-stove 11 for heating the water in such boiler.

Upon the front horizontal bars 4 of the frame are secured journal-boxes 12 for main axle 13, upon the ends of which are mounted the traction-wheels 14 and 15, which will support the forward part of the machine, while its rear is supported on caster-wheels 16, secured to brackets to the bottom of the rear standards 1 of the frame. Upon the axle 13 is also placed a sprocket-wheel 17, to which is rigidly secured a ratchet-wheel 18. The ratchet-wheel 18 and sprocket-wheel 17 are set loosely upon the axle 13, which is turned independently thereof in the well-known manner. The ratchet-wheel 18 is engaged by a pawl 19, pivoted to one arm of traction-wheel 14 whereby the said sprocket-wheel 17 will only be rotated with the said axle 13 and traction-wheel 14, while the machine is pushed forward, the pawl 19 riding over the teeth of the ratchet-wheel 18 while the machine is moved backward. Against the forward standards 2 of the frame is secured a frame 20, against the upper face of the side bars of which is journaled a shaft 21, having mounted upon one end a sprocket-wheel 22, driven from sprocket-wheel 17 by an endless chain 23, and upon the opposite end of this shaft is mounted another sprocket-wheel 24, and intermediate of its journal-boxes are mounted upon this shaft 21 two bevel gear-wheels 25, each meshing a bevel-pinion 26, mounted upon the upper extremities of two vertical shafts 27, loosely held with freedom from vertical movement on the transverse bars of frame 20, which shafts 27, have secured to their lower ends **S**-shaped brushes 28, thus rotated by such gear-wheels 25 and 26 in opposite directions, but placed relative to each other to clear one another. Brushes thus shaped like the letter **S** and rotated in the directions indicated by arrows in Fig. 6 will counteract the centrifugal force for the water sprinkled upon the floor not to be pushed sidewise, but to be held under the brushes. The hubs for these brushes 28 are grooved for the bifurcated ends of a cross-bar 29 to engage the same, which by a rod 30 is coupled to a crank of a bell-crank 31, pivoted to the standards of the frame 20 of the frame, the other single arm of which bell-crank is connected to the end of a rod 32, extended through a loop 32^a on one of the rear standards 1 of the frame, with a handle to its rear end for pulling the rod and thereby lifting the brushes 28 and shafts 27, the gearing 25 and 26 permitting sufficient movement to al-

low the brushes and shafts 27 to be raised a little to cause the brushes to clear the floor, holding the same suspended by engaging one of a series of collars 33 of rod 32 behind the loop of standard 1, when it is not desired to use these brushes—as, for instance, when cleaning waxed floors of dancing-halls that only require mopping.

Against the side bars of frame 20 are fixed brackets 34 for supporting a sprinkler-pipe 35, having a series of nozzles or perforations 35^a and being connected with the boiler by a flexible pipe or rubber hose 36 and by a stop-cock 37.

Between the standards 1 and 3 is supported on longitudinal bars 5 of the frame a tank 38, and above this tank is the wringer-roller 39, journaled in bars 7, and vertically above this roller 39 is journaled in journal-boxes 40 another wringer-roller 41 of larger diameter, these journal-boxes 40 being guided in upright frames 42, secured upon bars 7, each being pushed downward by a spiral spring 43, adjusted by thumb-screws 44. An endless mopping-sheet 45 is passed under a cylindrical brush 46, journaled in L-shaped notches in the lower ends of standards 1 of the frame, is thence passed under a roller 47, journaled in L-shaped notches in the lower ends of standards 3 of the frame, is thence passed over roller 48, journaled between bars 7 of the frame, is thence passed between the wringer-rollers 39 and 41, and thence the endless mop is stretched over the roller 49, the end journals of which extend through vertical slots in standards 1 of the frame, and are journaled with their ends in the eyed ends of a U-shaped bar 50, that is detachably hooked into any one of a pair of notches 51, cut into the front ends of standards 1 of the frame, and, finally, this endless mop is passed over a roller 52 journaled in boxes 53, sliding between the prongs of bifurcated arms 54, secured against standards 1 of the frame, each by a bolt to be pivotally adjustable thereon, these boxes 53 being adjustably held at the desired position each by a pin inserted into any one of a series of holes in such arms 54.

Upon the overhanging end of one of the journals of wringer-roller 41 is mounted a sprocket-wheel 55, and upon a shaft 56, pivoted in eyes of standards 1 of the frame below the handle 8, is rigidly mounted a sprocket-wheel 57, and over the three sprocket-wheels 24, 55, and 57 is stretched an endless chain 58 for driving the brushes and the wringer-roller 41 simultaneously, and the endless mop 45, passing between the wringer-rollers 39 and 41 and being compressed between the same, the motion transmitted to these wringer-rollers will move the apron around the tank to be squeezed out between these rollers for discharging the dirty water absorbed by this mop into tank 38, which from time to time may be emptied into buckets through hose 59. By releasing the U-shaped bar 50 from the notches 51 of standard 1 of the frame the roller 49 will drop into the bottom of the sockets in such standard 1, when the mop 45 will become slack and will partly drag upon the floor for sweeping the same, as shown in dotted lines on Fig. 3, while at the same time this mop will be moved by the wringer-rollers around tank 38, and while the mop is not to be used it can be stretched and sufficiently lifted not to touch the floor by lifting-bar 50 and suspending it in the uppermost notches 51, the hairs of brush 46 yielding sufficiently to allow the mop to clear the floor.

Upon each end of shaft 56 is rigidly mounted a ratchet-wheel 60, and exterior of each ratchet-wheel is loosely mounted thereon a crank 61, each provided with a pawl actuated by a spring to engage the teeth of such ratchet-wheels 60 by turning such cranks in one direction and sliding over the teeth thereof in the opposite direction. By these cranks 61 the brushes and mop can be operated without moving the machine when during such operation the sprocket-wheel 17 will turn loose upon the axle 13, its ratchet-wheel 18 not then engaging the pawl 19 during such operation, which arrangement has been provided for enabling the scrubbing of certain more dirty spots of the floor more thoroughly without having to move the machine to and fro.

A rubber strip 62, clamped between two bars 63, secured by brackets 64 to standards 1 of the frame, is applied for scraping the floor after the mop has been passed over to remove water or dirt not previously taken up by the mop.

It will be readily understood that a machine thus provided with rotary S-shaped brushes that can be raised or lowered at the will of the operator and with an endless mop kept moving by the wringer while dragging over the floor for taking up the dirty water and depositing it into a tank, all arranged to be driven by pushing the machine over the floor or by hand-cranks, while the machine remains stationary, are great advantages for accomplishing the desired purpose, and it will also be seen that the machine is very compact, without being cumbrous or complicated in its construction, and cannot easily get out of order.

What I claim is—

1. In a scrubbing-machine, the combination of S-shaped brushes 28, upright shafts 27, to which said brushes are secured, pinions on said upright shafts, and a transverse shaft 21, having gears for engaging said pinions, said brushes being capable of elevation, as set forth.

2. The combination, in a scrubbing-machine, of S-shaped brushes 28, upright shafts 27, to which said brushes are secured and which are vertically adjustable to raise and lower the brushes, and bar 29, rod 30, and bell-crank lever 31 for raising and lowering said brushes and shafts, as set forth.

3. The combination, in a scrubbing-machine, of tank 38, supported in the frame

thereof, endless mopping-apron 45, placed around such tank and moving under cylindrical brush 46 and roller 47 below the tank, and over rollers 48 and 49 above the tank, and over roller 52 in the rear of such tank, the roller 49 being vertically adjustable and the roller 52 being longitudinally adjustable and wringer-rollers 39 and 41 above the tank for the apron 45 to pass between and to be moved by such wringer-roller 41, substantially as set forth.

4. The combination, in a scrubbing-machine, of tank 38, supported in the frame thereof, a cylindrical brush and a roller 47 below the tank, a roller 48 and a roller 49, journaled in a U-shaped bar 50, engaging notches 51, the frame for vertical adjustment above the tank, a roller 52, journaled in arms 54 in the rear of the tank, and an endless mopping-apron 45, spread over such rollers and through a wringer above the tank, consisting of rollers 30 and 41, to which power is transmitted, and whereby motion is transmitted to the mopping-apron, substantially as set forth.

5. The combination, in a scrubbing-machine, of the main frame carrying boiler 9 and tank 38 and supported on traction-wheels 14 and 15 and on caster-wheels 16, sprocket-wheel 17, loosely sleeved upon the traction-wheel axle, ratchet-wheel 18, secured to such sprocket-wheel, a pawl 19, secured to the traction-wheel 14 and engaging the ratchet-wheel, shaft 56, with loosely-mounted crank 61, provided with pawls engaging ratchet-wheels 60, rigidly mounted thereon, sprocket-wheel 57, also mounted upon shaft 56, and endless chains passed over sprocket-wheels 17 and 57 for transmitting motion to the rotary brushes and to the wringer from both the motion of the traction-wheels and the crank-shaft 56, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JONAS ZIV.

Witnesses:
WILLIAM H. LOTZ,
OTTO LUEBKERT.