W. S. FINNELL.

ROTARY FLOOR SCRUBBING MACHINE.

APPLICATION FILED OCT. 23, 1917.

1,434,109. Patented Oct. 31, 1922.

3 SHEETS—SHEET 1.

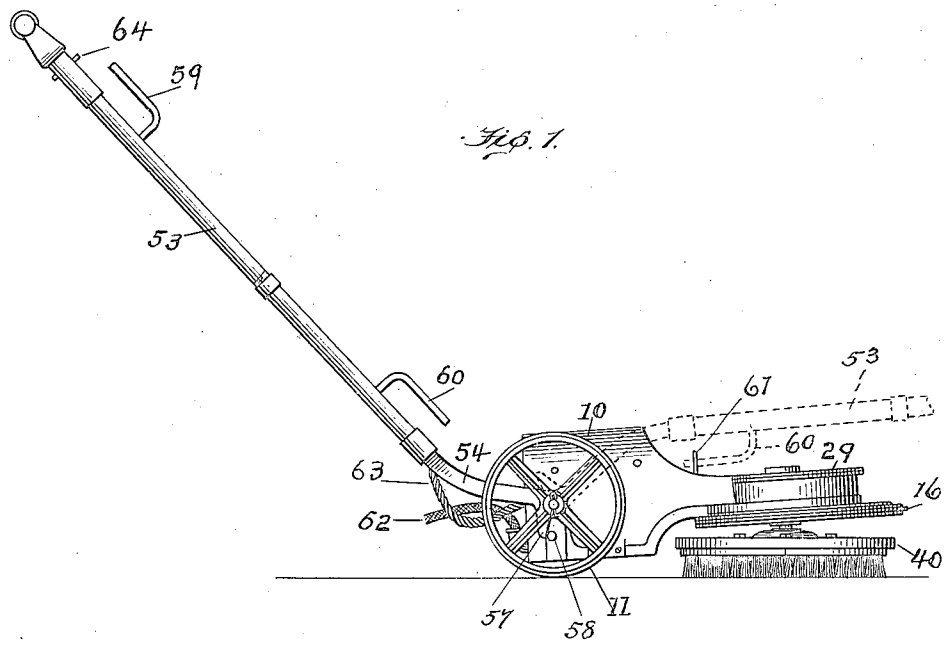


Fig. 1.

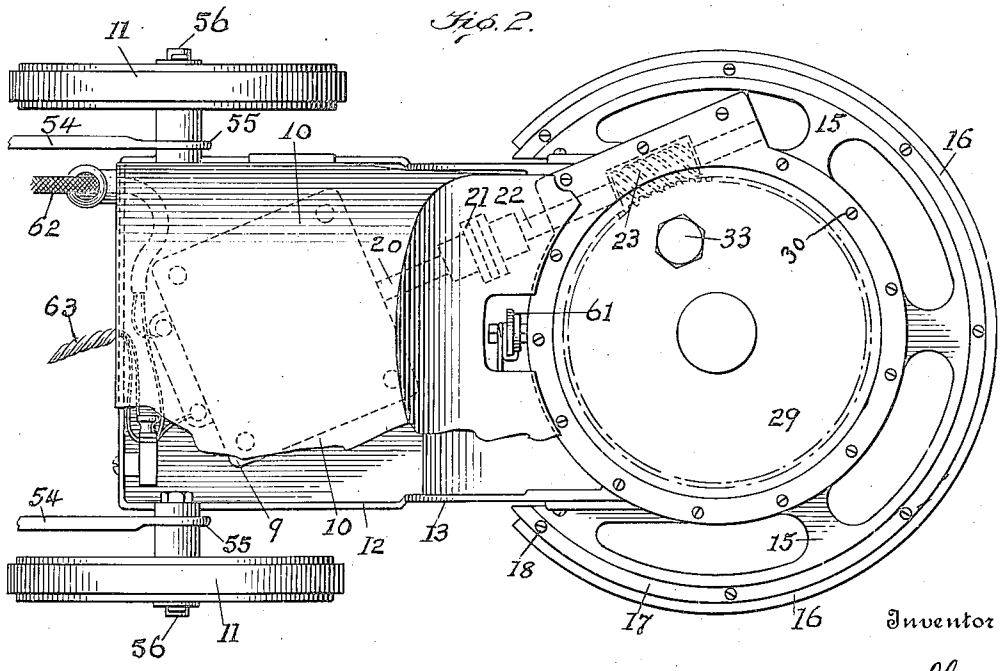


Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3

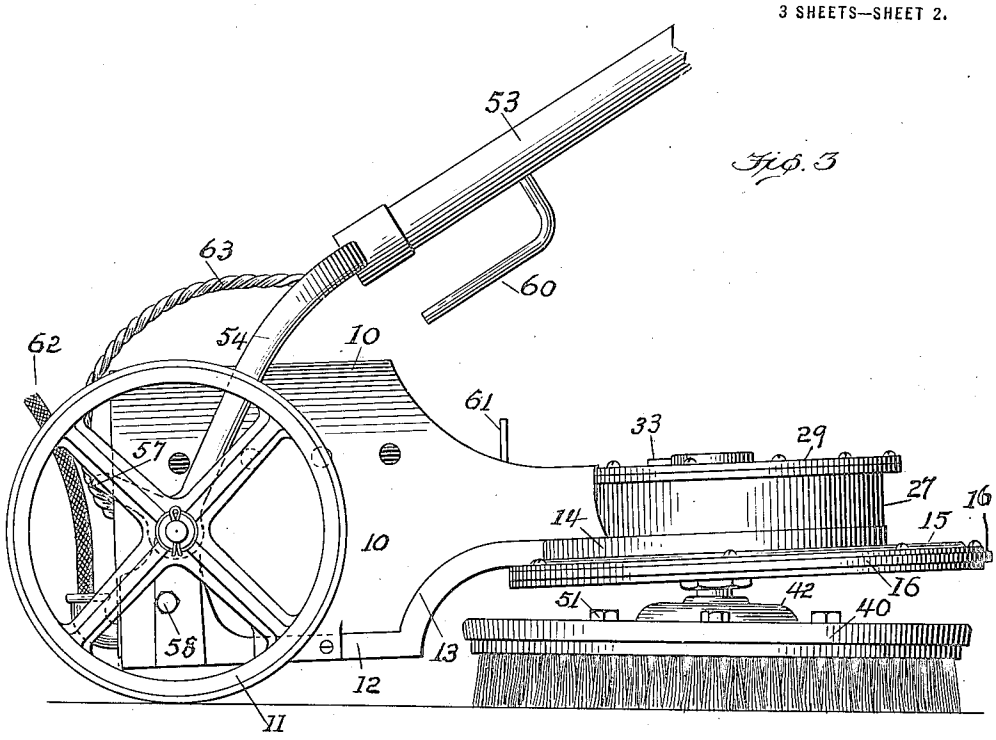


Fig. 6.

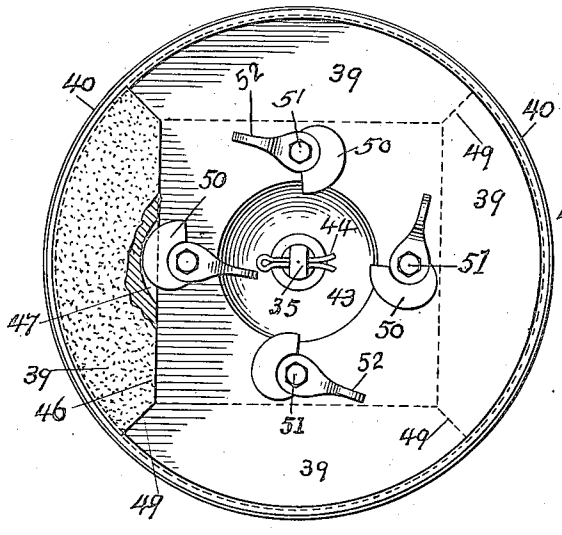
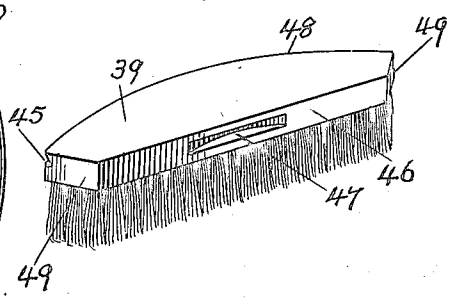


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 4.

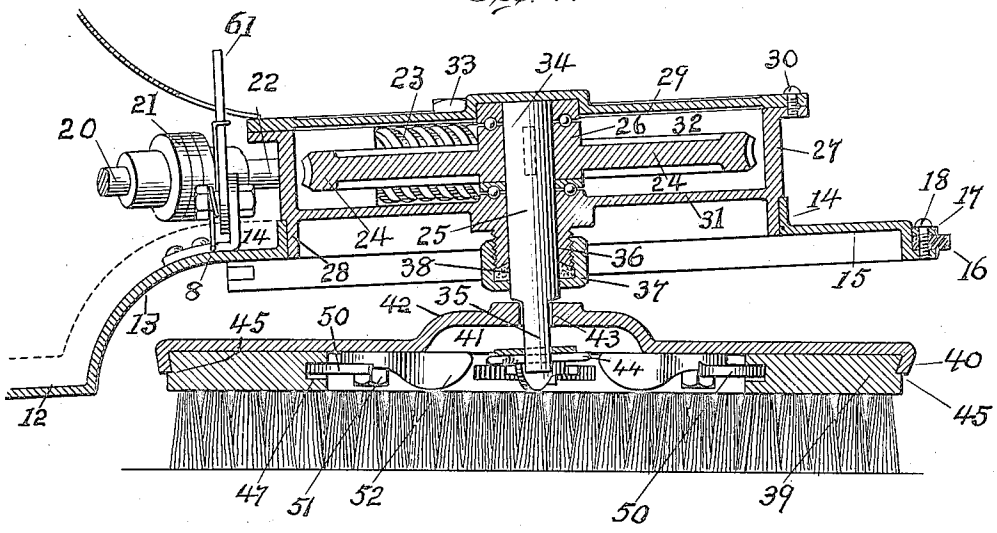
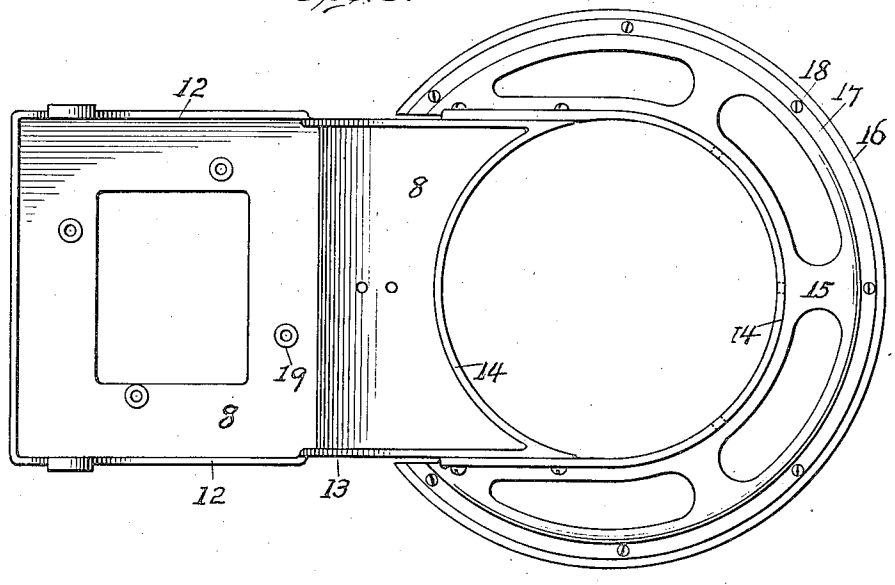


Fig. 5.



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UNITED STATES PATENT OFFICE.

WALTER S. FINNELL, OF HANNIBAL, MISSOURI, ASSIGNOR TO AMERICAN SCRUBBING EQUIPMENT COMPANY, OF HANNIBAL, MISSOURI, A CORPORATION OF DELAWARE.

ROTARY FLOOR-SCRUBBING MACHINE.

Application filed October 23, 1917. Serial No. 198,038.

To all whom it may concern:

Be it known that I, WALTER S. FINNELL, a citizen of the United States, residing at Hannibal, in the county of Marion and State of Missouri, have invented certain new and useful Improvements in Rotary Floor-Scrubbing Machines, of which the following is a specification.

This invention relates to improvements in rotary scrubbing machines for scrubbing the surface of floors.

In the type of machine to which these improvements are applicable rotary brushes are sustained pendantly from a frame which is mounted on wheels that traverse the floor surface that is to be scrubbed.

The improvements will first be described and the invention will then be claimed.

In the accompanying drawing which illustrates the invention,

Fig. 1, shows a side elevation of the floor-scrubbing machine the handle being placed in its operative position where it serves to push the machine, and is also shown by broken lines tilted forward.

Fig. 2, is a top plan view of the machine-base and engine cover, all mounted on two wheels, the drawing being on a larger scale than in Fig. 1.

Fig. 3, is a side elevation of the machine in which the handle is tilted from the operative position partly forward.

Fig. 4, is a vertical section of the machine and the circular scrub-brush drawn on a larger scale than Fig. 4, the handle being in the operative position to push the machine.

Fig. 5, is a plan view of the machine-base and circular buffer.

Fig. 6, shows an inverted or bottom view of the circular-shaped brush and its cam fastening devices.

Fig. 7, is a perspective view of one of the one-quarter sections of the circular brush.

Referring now to the drawing for a description of the parts the numeral, 8, designates the base-plate on which an electric motor 9, having a rectangular shape as shown by broken lines in Fig. 2, is carried; over the motor is a cover, 10, which is shown partly broken away at one side.

The motor 9, is confined to its seat on the base-plate, 8, by bolts that pass through holes, 19, in the said plate.

The base is suitably supported on two wheels 11, and has at each side thereof an up-turned flange 12, whose forward ends curve upwardly at 13 and then extend forward where said ends sustain a ring 14. From the base of this ring there projects a horizontal flange 15 and a cushion 16 of some elastic material, such as rubber is clamped to the flange by a ring-plate 17, and screws, 18. The circular-shaped plate with the cushioned edge, 16, serves as a buffer and takes the knocks when the machine at the time of moving over the floor may strike against an obstruction.

The shaft, 20, of the motor, see Fig. 4 and also broken lines in Fig. 2, has a coupling, 21, that connects with a worm-shaft, 22; the worm, 23, engages the worm-gear, 24, which turns in a horizontal plane; this wheel is made fast to an upright shaft, 25, and the wheel has a hub, 26, whose upper side is provided with a circular groove which forms part of the race of a ball-bearing; the other circular grooves to complete the ball-bearing are shown in Fig. 4, and will be readily understood. The worm wheel, ball-bearing and shaft are all enclosed in a circular box, 27, whose lower rim-edge, 28, sets down and within the ring, 14, attached to the base-plate, 8. The circular box has a cover, 29, secured by screws, 30, and within the box is a tight bottom, 31, which box forms a grease chamber, 32, and the cover of the box has a hole closed by a screw-plug, 33. The hole and screw-plug provide for charging the worm-gear-enclosing box with grease.

The upright shaft, 25, has its upper portion round, as at, 34, and its lower portion and end flattened, as at 35, for purposes that will now be explained. The round part of this shaft turns in a stuffing-box attached to the bottom, 31, of the grease-chamber, 32, and the flat end projects below. In this instance the screw-threaded boss, 36, of the stuffing-box is the part that is integrally attached to said chamber-bottom, 31, and a ring-shaped screw-cap, 37, fits snugly on the round part of the shaft, 25, and the screw-threads of the cap engage the threads of said boss, 36, leaving the entire flattened end, 35, of the shaft projecting below the stuffing-box. The packing, 38, is shown in Fig. 4; this stuffing-box prevents oil escaping from the grease chamber and then dripping on the floor that is being scrubbed.

The scrub brush is preferably circular in shape, and consists of a plurality of sections

39, say three or four, in the present instance four, are indicated by broken lines in Fig. 6. The scrub brush has a metal top with a circular down-flanged rim, 40; this top at the center has a cavity, 41, on its lower side and a corresponding convex formation 42, on its upper side. It will be seen in Fig. 4 that the down-flanged rim, 40, inclines inwardly and engages a groove 45, in the wood back of the brush-sections. The center of the convex part has a hole, 43, which loosely receives the lower flat end, 35, of said upright shaft, and a cotter pin, 44, through the flat end secures the metal top-holder and scrub-brush from dropping off said flat end. This construction permits the circular scrub brush to have a free wabbling movement on an uneven floor.

One of the wood-block brush-sections, 39, is shown in Fig. 7. It will be seen the wood block has one of its long edges, 46, straight and said edge is provided with a slot, 47; the opposite side of the block is curved as at 48, from end to end, and this curved edge has the groove 45, which is engaged by the turned-down circular rim 40, as seen in Fig. 4. The two opposite ends 49 of the wood block, 39, are cut to an angle corresponding with the radial lines of a circle of which the said curved edge, 48, of block 39, is an arc. Said angle ends, 49, are plainly shown in Fig. 7, and are also indicated by broken lines in Fig. 6. When the several brush-sections 39, are assembled together, whatever number of sections may be employed, said plural sections will together form a circular brush, and the circular turned-down rim 40 will surround the several brush-sections like a hoop, and all the sections may then be expanded from the center or forced by the cams outwardly against the turned-down rim, as presently described, which expansion will cause the groove 45, on the curved edge of each brush-section to engage said inclined down-rim, 40, as in Fig. 4.

There are as many cams, 50, as brush-sections 39; each cam is pivoted on a bolt, 51, and located at the lower surface of the same circular metal plate that has the down-flanged rim, 40. Each cam has a thumb-piece, 52, which enables a person with his hand to operate the cam. One cam-face is intended to take effect in the slot, 47, formed on the straight edge of each brush-section. When the several brush-sections, 39, are in proper position to be fastened, the slot, 47, of each brush will be immediately opposite one of the cams 50; then by turning the several cams each cam-face will enter the slot opposite it and will produce two results, first, all the brush-sections, 39, will be forced outwardly from the center causing the curved groove 45, on each section to engage the said down-rim or hoop, 40, and second, the interlocking of the cam-faces, 50, with the slots, 47, on the brush-sections will securely fasten and hold said brush-sections from getting loose.

A handle consists of a tubular push-rod, 53, with one end free and the attached end having two prongs or bifurcations, 54, that straddle the engine cover, 10, and one end of each prong provided with a suitable eye or ring, 55, that engages the spindle bolt, 56, on which the wheel, 11, turns. Each bifurcation, 54, is provided adjacent its eye or ring, 55, with a laterally-projecting arm 57, shown in Fig. 1 and indicated in Fig. 3 by broken lines. This lateral arm projects downwardly when the handle 53, is in the pushing position, seen in Fig. 1, and when in this downward position said lateral arm 57, contacts with a stud or pin, 58, which stops any further down movement of the arm or the handle, 53, and the handle will be held up in its operative or inclined position to push. Again, when the handle is in the position seen in Fig. 3, or in the broken line position in Fig. 1 the lateral arm, 57, is inclined rearward and upward, and out of operative position, as likewise also is the handle itself.

The handle 53, is provided with two spaced-apart hook-prongs 59 and 60 about which the cable that conducts current to the motor may be coiled, as will presently be explained. The hook-prong 60, is so located on the handle that when the latter is swung forwardly over the box cover 29, when the machine is not in use, see broken lines Fig. 1, said hook-prong 60 will engage a latch 61, that will hold the handle down and the handle and machine parts will be locked against independent rocking motion. The front part of the machine may then be tilted up to lift the brush from the floor, and the machine may then be rolled over the floor with the brush elevated.

Current for driving the motor is conveyed to the machine through a cable 62, the outer end of the cable being provided with a plug, not shown, for engagement with any convenient electric socket connection. Branch wires, 63, are connected with the cable and motor and extend up through the hollow handle 53, to a push-button switch 64, in the upper end thereof so that the current to the motor may be readily controlled.

When the machine is not in use the stretch of cable 62, that is to connect with a socket (and not shown) may be wound about the two hook-prongs, 59, and 60, and thus such stretch of the cable is kept in good condition, and the machine may be moved from place to place with the cable so wound.

While in describing the structure of this machine the expression "floor scrubbing" has been used, nevertheless it is to be understood that a machine of this structure is not

only capable of scrubbing a floor, but it is also capable of polishing a floor, and the difference will be due to the material to be applied to the floor surface when operating the machine.

The present application does not contain claims for any novel features that are present in the rotary brush structure, such claims being made in a divisional application.

Having described my invention I claim—

1. In a floor scrubbing machine the combination with a base supported at opposite sides by wheels said base extending forwardly from said wheels with its front end elevated, of a circular plate sustained at the forward elevated end of said base; a circular box supported by said plate and having a cover whereby to form a horizontal chamber; a worm-gear in said chamber; a worm having its threads exposed in said chamber and meshing with the worm gear therein; a shaft having one end rigidly connected to the worm-gear said shaft being provided with a lower end that has flat sides thereon; a circular brush plate having a slot whose walls are engaged by the flat sides of the shaft-end whereby to rotate the brush-plate but permit vertical movement between the shaft and plate, and means for revolving the worm.

2. In a floor scrubbing machine the combination with a base supported at opposite sides and near one end by wheels said base extending forwardly from said wheels and having its forward end elevated, of an operating handle pivoted at opposite sides of the base adjacent the wheels said handle extending rearwardly from the wheels; means coacting between the handle and base whereby the base may be rocked on the wheels by the handle to raise or lower the forward end of the base; a circular box at the forward end of the base; driving means in said box said means including a depending shaft and a circular plate carried on the lower end of the shaft and locked to rotate therewith but movable freely in a vertical direction thereon.

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

WALTER S. FINNELL.

Witnesses:

W. F. CHAMBERLAIN,

J. G. MICKMAN.