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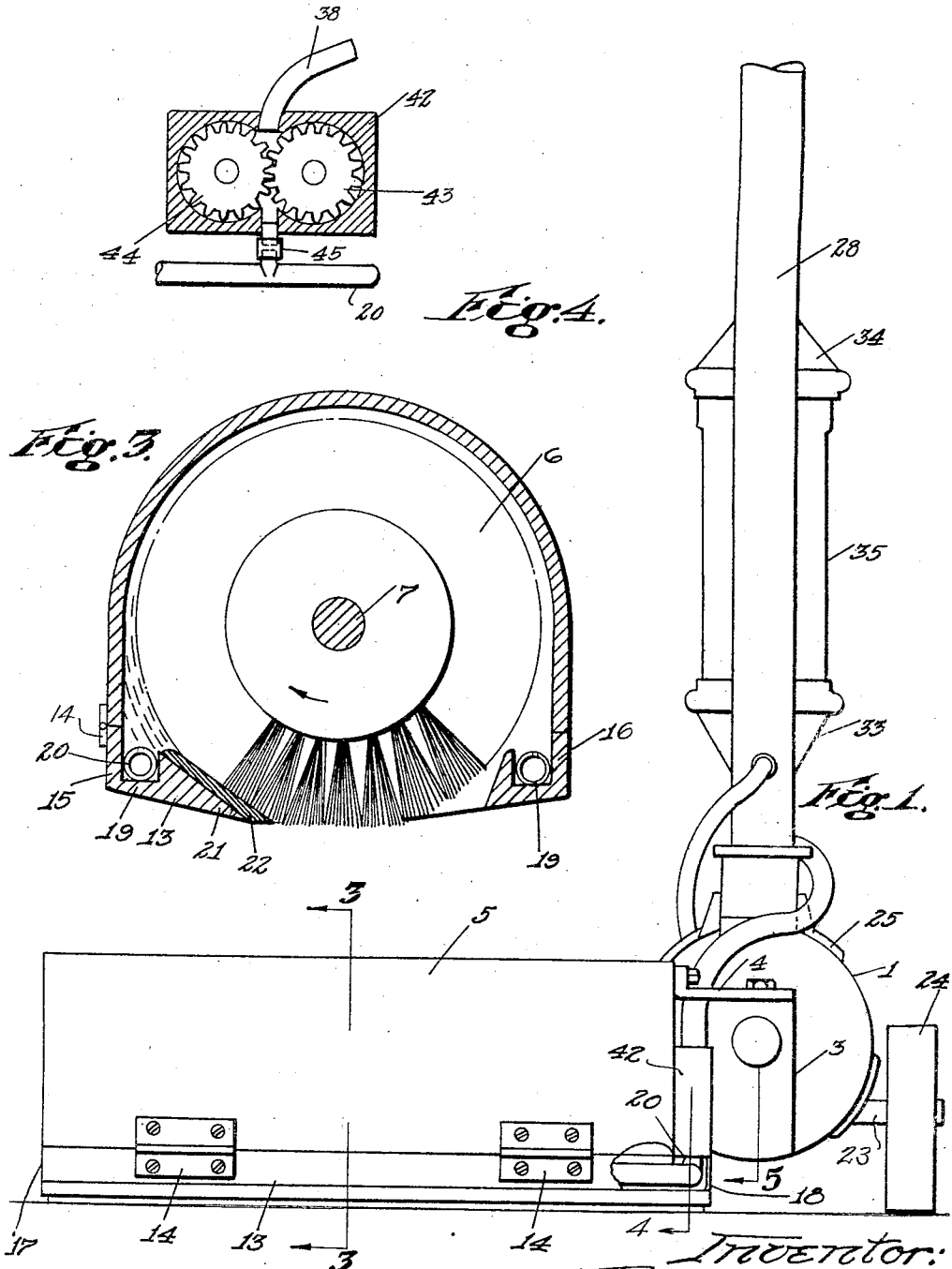
W. C. JEROME

1,892,347

FLOOR WASHING MACHINE

Filed March 19, 1930

4 Sheets-Sheet 1



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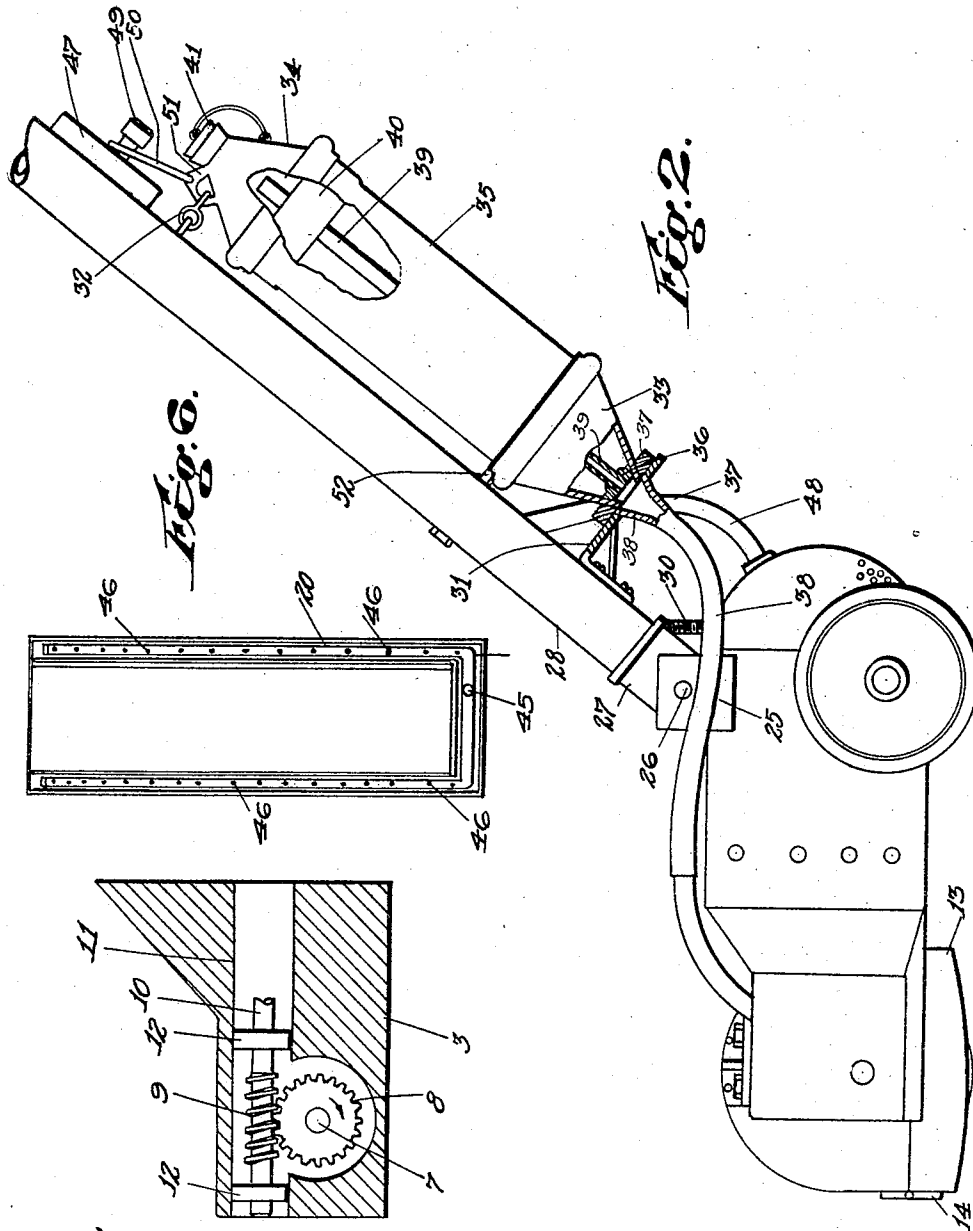
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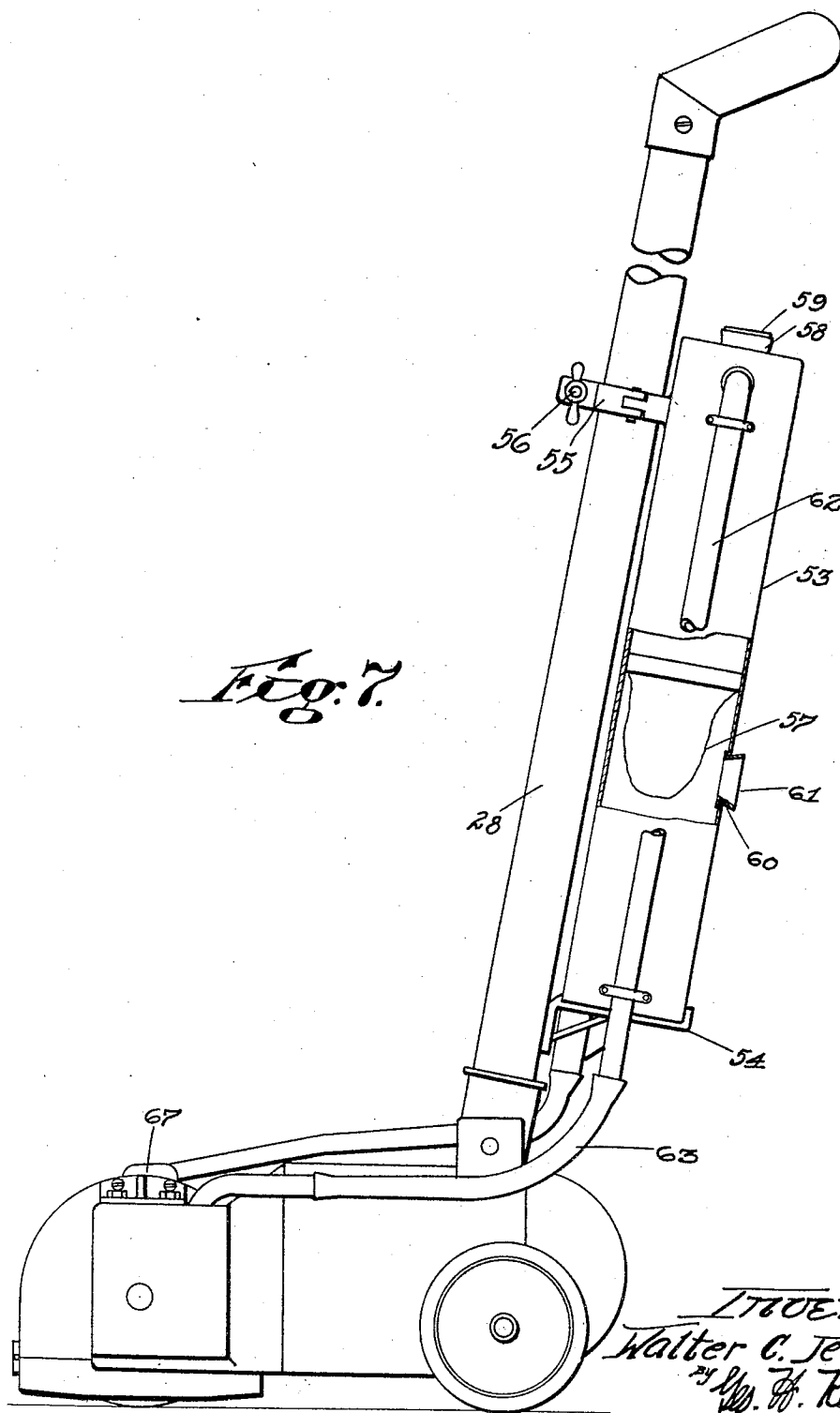


Fig. 7.

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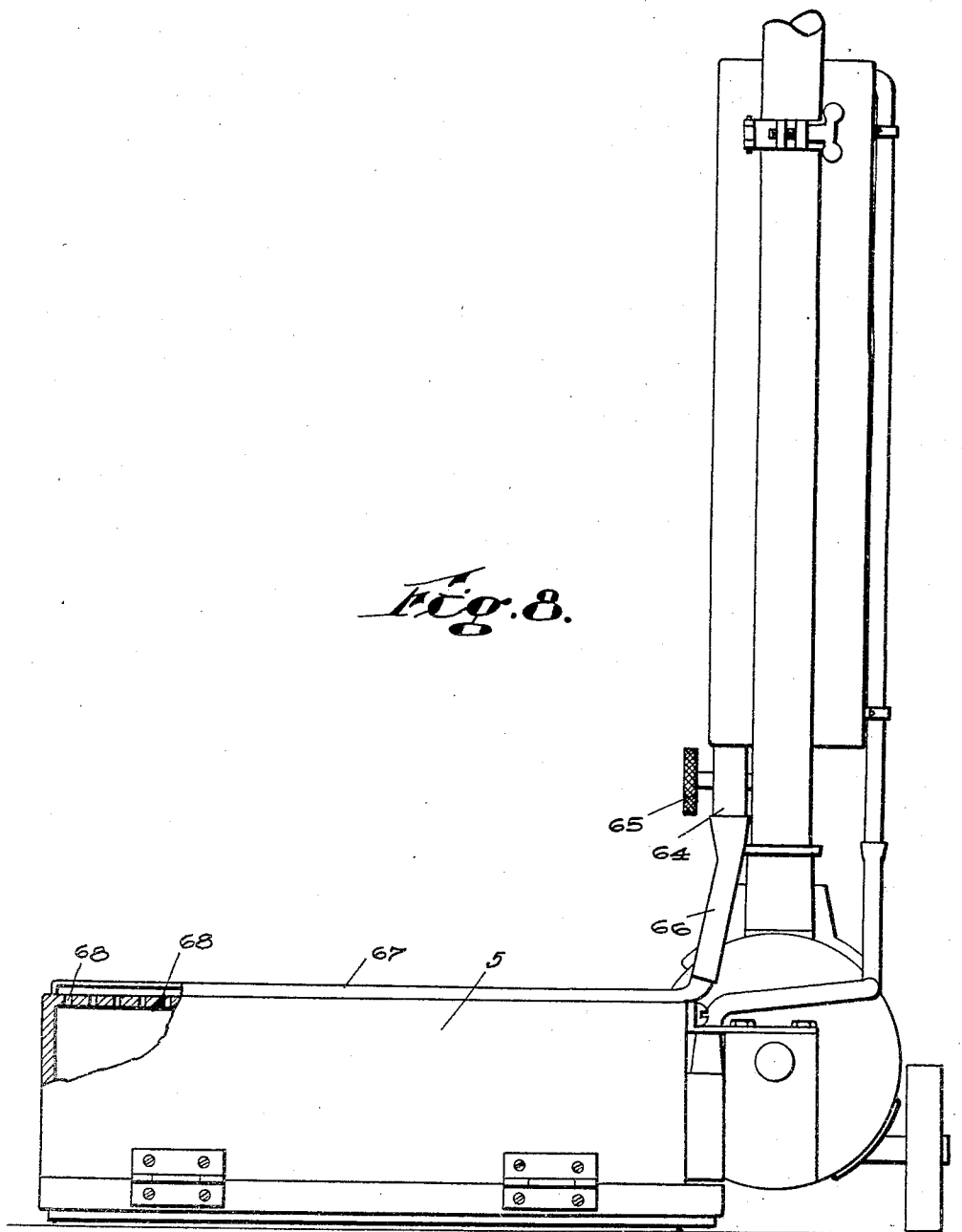
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Fig. 8.



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UNITED STATES PATENT OFFICE

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FLOOR WASHING MACHINE

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The invention relates to floor washing machines, particularly to that type of machine which is adapted to be pushed over the floor to be washed. One of the objects of the invention is to provide a machine of this character which will readily dry up the floor, after the washing operation, or during the washing operation, so that nothing is needed but to run the apparatus several times over the floor to be washed. The invention provides an element which follows the inequalities of the floor, and so assures effective removal of the water from the surface.

The invention involves the use of a rotary brush to effect the washing action, and means for feeding water to the brush from a tank, and for returning it thereto. The supply tank is carried on the handle of the machine and thus the machine is a self-contained unit.

In machines of this character heretofore made, it has been found that the suction orifices for removing the dirty water rapidly clog up. According to the present invention suction orifices are arranged in a detachable tube, which can be readily cleaned. This device may also be used to clean the brush, by simply reversing the action of the pump.

The above and other advantageous features of the invention will hereinafter more fully appear from the following detailed description, taken in connection with the accompanying drawings, in which:—

Fig. 1 is a front elevation of the machine of the invention.

Fig. 2 is a side elevational view, showing what is considered the left hand side of the machine, being taken from the right hand side of Fig. 1.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary vertical sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary vertical sectional view taken on the line 5—5 of Fig. 1.

Fig. 6 is a plan view of the lower member of the brush frame.

Fig. 7 is a side elevation showing a modified form of the invention.

Fig. 8 is a front elevation of the machine of Fig. 7.

Like reference characters refer to like parts throughout the drawings.

Referring first to Figs. 1 and 2, the machine comprises a suitable casing 1 in which is received an electric motor of any desired type. The front end of the casing 1 is suitably fastened to a gear box 3 which is shown in Figs. 1, 2 and 5. Fastened to the gear box 3 by means of a bracket 4 is the upper member 5 of a brush casing. Referring now to Figs. 3 and 5, a brush 6 is mounted on a shaft 7 which is suitably journaled in the casing member 5. The shaft 7 extends through the casing member 5 into the gear box 3, and has fastened to it a worm wheel 8 which meshes with a worm 9 on the motor shaft 10. The motor shaft 10 is located in a bore 11 in the gear box, and water and dirt are kept away from the gear box and from the motor by means of discs 12, 12 fastened to or integrally formed with the motor shaft 10.

Referring now to Figs. 1, 2 and 3, a lower casing member 13 is fastened to the upper casing member 5 by means of hinges 14, 14. The lower casing member comprises front and rear guard portions 15 and 16 for the brush 6, and right and left guard portions 17 and 18, in order that the brush may be completely inclosed and in order to compel all material being removed from the floor to be kept within the brush casing. Around the inside of the guard portions 15, 16 and 18 of the lower casing is a trough 19 for collecting the water which the brush 6 picks up off the floor. A pipe 20 is preferably contained in the trough 19 for reasons that will hereinafter appear.

The front guard portion 15 provides a downwardly and rearwardly extending portion 21 which extends almost to the floor. Attached to this portion is a flexible member 22 made of rubber or leather or some other substance which will flex and follow the inequalities of the floor being washed and the upper-surface of this member is engaged by the brush 6. The direction of rotation of the motor is such that the brush 6 revolves in the direction of the curved arrow, Fig. 3. It will

be apparent that the dirty water will be brushed up the apron member 22 into the trough 19 by the rotation of the brush against said member, and because of the flexing of the
5 apron member 22 which flexing is aided in part by the pressure of the bristles of the brush against the member it will be practically impossible for water to escape beneath it.

The rear end of the casing 1 has fastened
10 to it axles 23 upon which are mounted a pair of wheels 24. The wheels 24 together with the brush 6 support the machine. The casing 1 has also fastened thereto a bracket 25 which provides journals for a trunnion 26
15 provided by a handle socket 27 in which is located a handle 28. Desirably a stop 30 is employed in order to limit the backward movement of the handle 28.

Attached to the handle 28 is a bracket 31.
20 Higher up on the handle 28 is attached a hook 32. By means of the bracket 31 and hook 32 a water container is carried by the handle. As best shown in Figs. 1 and 2, this water container comprises a pair of conical
25 members 33 and 34 connected together by a cylindrical portion 35 preferably made of rubber or like material. Any suitable means may be adopted for making water tight joints between these parts.

30 Inside the container is a hollow stopper 36 which is adapted to plug up the outlet from the container, which outlet is located in but not fastened to a socket 37 provided by the piping 38. The socket 37 is permanently fastened to the bracket 31, and the lower end of
35 the conical member 33 of the container fits therein.

The stopper 36 is connected by a pipe 39 to a member 40 which has a tight fit with the
40 inside of the container and is located near the top thereof. The member 40 also comprises a strainer. The upper end of the conical member 34 of the container is normally closed by a stopper 41.

45 The piping 38, as will be seen in Figs. 1, 2 and 4, leads to the upper end of a casing 42 which may be attached to the brush housing 5 or to the casing 3, and in which is located a gear pump. This gear pump comprises a
50 pair of gears 43 and 44 one of which is keyed to the shaft 7. The other end of the gear pump thus formed is connected by means of a suitable detachable connection 45 to the pipe 20. The pipe 20 as will be noticed in
55 Fig. 6, is U-shaped in form, the ends being blocked and there being a plurality of holes 46 in the upper side of the pipe. It will be observed that the pipe is connected to the container just described by way of the pump
60 43, 44.

The motor that drives the machine is preferably of the reversible type, and a reversible switch 47 is connected to said motor by means of a cable 48. The switch 47 has a handle
65 49 which when moved into its upper position

causes the brush 6 to rotate in an anti-clockwise direction, and the gear pump to revolve with the gear 43 moving in a clockwise direction. The handle 49 is connected by means of a link 50 to a connection 51 provided on
70 the side of the member 34 which also receives the hook 32. When the handle 49 of the switch is drawn upwardly, the portion 34 of the container is raised. This action does not
75 serve to draw the lower conical member 33 out of the socket 37 provided for it, because of the provision of a stop 52 which holds said member 33, and because the cylindrical portion 35 of the container is flexible and will stretch. On account of the frictional attachment of the strainer 40 to the upper portion
80 of the container, the plug 36 is withdrawn from the discharge end of the member 33, and thus water is allowed to flow through the pump 43, 44 to the pipe 20. Water therefore sprays through the holes 46 onto the brush and is distributed over the floor.

When the switch lever 49 is pushed to its lower position, the plug 36 is allowed to re-engage the opening in the end of the discharge member 33, and the gears 43 and 44 are driven in the opposite direction, so that a suction is created on the pipe 20. At the same time the brush 6 is rotated in the direction of the arrow, Fig. 3, and thus tends to pick dirt
85 90 95 off the floor.

It will be seen that by sliding the link 51 off the handle 49, unhooking the hook 32, and pulling the container downward it can be removed entirely from the handle 28.

The machine is intended to be operated as follows:—

The container 33, 34, 35 having been removed from the handle and the plug 41 removed, it is filled with water. The container
105 will then be replaced on the handle 28, and when the machine is over the floor to be cleaned, the end of the electric cable, not shown, will be plugged into a suitable wall socket. The handle 49 of the reversing
110 switch 47 should immediately be raised, whereupon water will descend through the piping 38 as already described. The water will be driven by the force of the pump 43, 44 through the holes 46 spraying upon the
115 brush 6, which should then be rapidly moved to and fro over the floor, in order to cover the floor with water and to loosen the dirt.

When sufficient water has been discharged upon the floor and the dirt has been loosened, the reversing switch lever 49 will be moved to the lower position. This will cause the plug 36 to block the discharge outlet of the container where it fits into the socket 37, but owing to the fact that the plug 36 is hollow and is connected to the pipe 39, a passage
120 125 is provided for water to the upper part of the container, above the strainer 40. The gear pump 43, 44 will of course start moving in the opposite direction, as will also the brush 6,
130

the brush moving clockwise as shown in Fig. 3. The brush will therefore immediately start sweeping water into the trough 19, and as soon as sufficient water has collected therein, the action of the pump will suck it out through the holes 46.

The dirty water will flow back into the container from the top end of the pipe 39, which as noted extends above the strainer 40. The water will immediately pass downwardly through the strainer, leaving, however, a great part of the dirt therein. Thus a separate portion of the floor can be cleaned without the necessity of providing entirely fresh water for the container, at least until the strainer 40 has become largely filled with dirt.

When the floor has been cleaned and the container contains turbid water, and the strainer 40 is well filled with dirt, the container may be removed again and cleaned by emptying it and forcing water up through the strainer 40.

In order to remove the water from the floor it is desirable to move the machine backwards while the brush is rotating in the direction of the arrow in Fig. 3, as this action effectively sweeps the water up into the trough 19. The flexible member 22 follows the inequalities of the floor and prevents the water from escaping.

A modification of the invention is shown in Figs. 7 and 8, in which a different container and different water connections are provided, in other respects the machine being substantially as already described. According to this modification, a container 53 is provided which may be of cylindrical shape, as shown. This container is fastened to the handle 28 by means of a supporting bracket 54 and a clamp 55 having a hand screw 56 to hold it together.

The inside of the container 53 is separated into two parts by a diaphragm 57 which is flexible but substantially impervious to water. The upper compartment is provided with an opening 58 closed by a stopper 59, while the lower compartment is provided with an opening closed by a stopper 61. A pipe 62 is fastened to the side of the container 53 and leads from the upper end thereof. This piping is detachably connected by means of a flexible pipe 63 to the upper end of the gear pump 43, 44. In this embodiment of the invention, no reversible switch is provided and the pump always operates to suck water out of the pipe 20.

The lower compartment of the tank 53 is provided with an outlet 64 which is controlled by a valve 65. The outlet 64 is connected by flexible piping 66 to a long chamber 67 provided on the top of the brush casing 5. A series of holes 68 are provided through the casing 5 under the chamber 67.

It will be seen that when the valve 65 is turned, water will be discharged through

the holes 68 onto the brush. In this way clean water may be fed to the surface being cleaned while the dirty water is being continually picked up.

In both modifications of the invention it will be seen that the suction ports for the water comprise a great plurality of holes, and that there is no possibility of dirt clogging the apparatus, particularly as the pipe 20 may be removed and water forced through it in the opposite direction to clean it. The trough 19 can easily be cleaned when the pipe 20 is removed. It should be understood, however, that the trough 19 may be used to receive the water, which may be sucked up by a simple nozzle without the use of the pipe 20.

I claim,

1. In apparatus of the class described, a brush, a casing for said brush, a trough to receive water from said brush, and a pipe in said trough having holes in the top and a reversible pump means to direct water in either direction through said holes.

2. In apparatus of the class described, a container for water, a socket, a portion of said container extending within and being supported by said socket, a hollow plug valve fitting inside of said portion, a hollow tube connected to said hollow valve, and means for removing said hollow plug at will.

3. In apparatus of the class described, a brush, a casing for said brush, a collecting trough for water in said casing, a conduit connected to said trough, a socket in the upper end of said conduit, and a detachable container fitting in said socket.

4. In apparatus of the class described, a brush, an upper casing member for said brush, a lower casing member for said brush, a trough in said lower casing member, a pipe in said trough, holes in the top of said pipe, whereby to collect water from said trough and means connected to said pipe to remove water from the pipe.

5. In apparatus of the class described, a pair of conical members, an extensible cylindrical member connecting said conical members thus forming a container, a hollow rod inside of said container, a strainer surrounding said rod in engagement with said flexible cylindrical member, and a hollow stopper at the other end of said rod, whereby movement of the upper conical member withdraws the stopper from the lower conical member.

6. In apparatus of the class described, the combination with a brush, means to receive water from said brush and means to deliver water to said brush, of a container, a flexible waterproof diaphragm dividing said container into two parts, and piping running from one side of said diaphragm to the means to receive water from the brush, and further piping running from the other side of said diaphragm to the means to deliver said water to said brush.

7. In apparatus of the class described, the combination with a brush, an upper casing member for said brush, a lower casing member detachably connected to said upper casing member, a trough in said lower casing member, a pipe in said trough, holes in the top of said pipe, and a flexible apron carried by said lower casing member, and in contact with said brush, whereby to facilitate removal of water from a floor into said trough, of a reversible pump connected to said pipe, and a container also connected to said pump to receive water from the trough and to supply water to said brush.

8. In apparatus of the class described, a brush, an upper casing member for said brush, a lower casing member detachably connected to said upper casing member, a trough in said lower casing member, means for removing water from said trough and a flexible apron carried by said lower casing member and supported by said member with the lower end thereof in contact with the floor substantially beneath said brush, the lower end of said apron being in contact with said brush where the surface of said brush is rotating away from said floor, whereby to facilitate removal of water from a floor into said trough.

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