

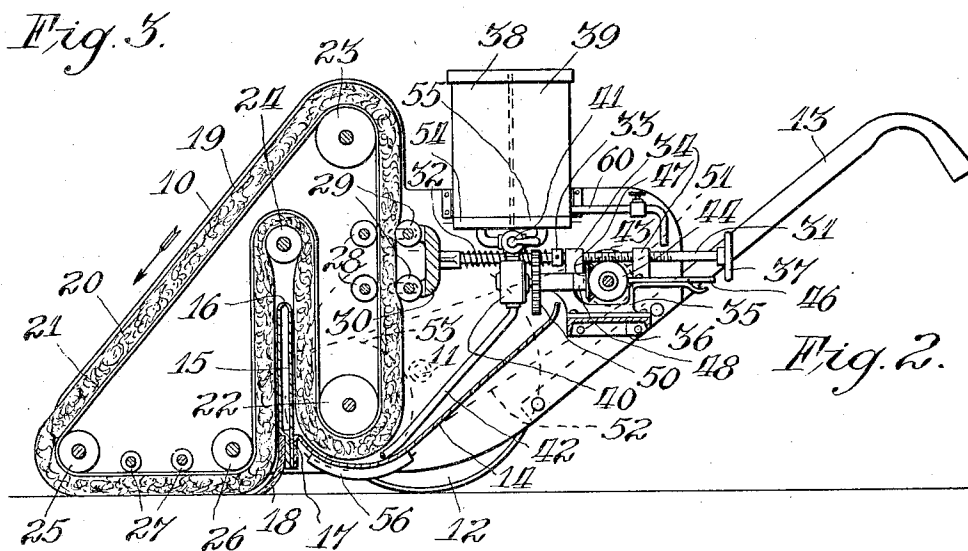
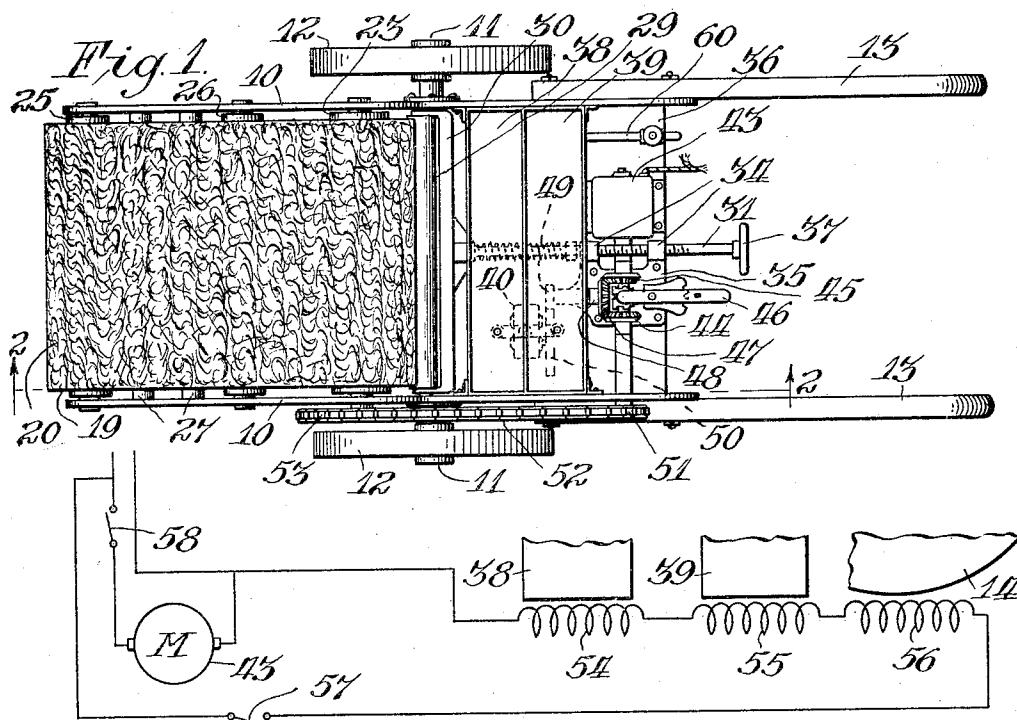
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MECHANICAL SCRUBBER

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MECHANICAL SCRUBBER

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The present invention relates to floor washing or scrubbing machines, and is directed to improvements giving added efficiency and facility of operation to machines of that class.

The main object of the invention is to provide a machine of the class stated having self-contained means for changing the character of the fluid or wash water supplied to the floor engaging element or scrubber and for optionally using the floor engaging element without fluid supply and as a floor drying mop. A further object is to improve the character and location and manner of operation of a floor scrubber element of the endless apron type, so that a substantial area of the floor is engaged thereby and the floor engaging portion is positioned for most efficient operation. Other objects and advantages will become apparent from the following detailed description of the combination of elements and details of construction embodying the invention, all as illustrated in the accompanying drawing, wherein:

Figure 1 is a plan view of a machine embodying the invention.

Figure 2 is a longitudinal, vertical section on the line 2—2 of Figure 1; and

Figure 3 is a diagrammatic view showing the electric circuit employed in the machine.

In the present instance, the structure embodying the invention has been illustrated as consisting of a movable support comprising vertical side plates 10 having suitable spindles 11 on which supporting wheels 12 are journaled. The side plates extend both forwardly and rearwardly of the axis of the supporting wheels, and the rear ends of these plates have secured thereto propelling handles 13. The side plates 10 serve also as the side walls for the main supply or service tank of the machine, which tank is formed by connecting the side plates with a transverse sheet metal trough 14, open at the top and having a vertical forward wall 15, which is preferably formed by bending the sheet metal forming the trough back upon itself, as at 16, to provide additional strength and thickness at that part of the tank. The lower edge of the rebent portion is preferably

formed with a shoulder, as at 17, forming a seat for a flexible squeegee element 18 adapted to engage the floor and to cooperate with the scrubbing element in a manner to be described. The floor engaging or scrubbing element preferably consists of an endless apron 19 composed of absorbent material, indicated at 20, which is fixed to a suitable base fabric 21. The apron 19 has its rear portion extending in substantially vertical planes, as seen in Figure 2, and its rear end passes over a driving roller 22 adjacent the bottom of the service tank. Directly above the roller 22 the side plates 10 carry an upper supporting roller 23 over which the upper run of the apron travels, and, directly above the front wall 15 of the service tank, the side plates carry a supporting roll 24 over which the lower run of the apron passes. This arrangement of supporting rolls causes the rear end of the apron to dip vertically downwardly into the service tank.

The forward end of the apron passes over rollers 25 and 26 located in the same horizontal plane adjacent the lower edge of the forwardly extending portions of the side plates 10. These rollers are spaced a substantial distance in a fore and aft direction and, therefore, cause the scrubbing apron to present a considerable area for contact with the floor surface. Auxiliary pressure rollers 27 may be provided intermediate the main rollers 25 and 26 for assuring contact of the apron with the floor surface. The portion of the apron extending from the forward roller 25 to the upper supporting roller 23 is accordingly disposed in a rearwardly and upwardly extending direction, and the forward end of the machine is, therefore, capable of being introduced beneath standing furniture and into floor corners conveniently. The rear roller 26 is so spaced from the forward wall of the service tank as to provide a space substantially equal to the thickness of the apron between said roller and that wall. As the scrubbing apron travels in the direction indicated by the arrow in Figure 2, the arrangement stated will favor the raising of excess fluid by the apron over the front wall of the service tank, which action will be assisted by the

squeegee element 18, which is shaped to conform to the curve of the apron as it passes over roller 26. In order to control the amount of fluid retained by the scrubbing apron there is provided a set of wringer rolls consisting of a pair of fixed rolls 28 having vertically spaced axes and over which the vertically extending part of the outer run of the apron travels. Opposed to the rolls 28 is a pair of adjustable rolls 29 carried on a transverse bracket 30 supported on the end of a horizontal shaft 31 extending towards the rear of the machine.

The connection of the bracket 30 with shaft 31 is preferably slidable, or telescopic, and a spiral spring 32 carried by the shaft has its ends engaging a set collar 33 thereon and the bracket 30, respectively, thus urging the bracket and rolls towards the belt. The shaft 31 is screw threaded throughout a portion of its length and the screw threaded portion is received in threaded lugs 34 projecting upwardly from a base casting 35 mounted on a transverse shelf 36 connecting the rearward portions of the side plates 10. The rear end of the shaft 31 has suitable means, such as a hand wheel 37, for adjusting the compression of the wringer rolls.

It will be seen that the structure so far described is one providing a scrubber of the endless apron type in which a substantial area of the floor is under treatment and in which the scrubbing element may be used either to apply water to the floor or to mop up water therefrom, and in which the quantity of water carried by the apron may be regulated at will.

In connection with the scrubbing mechanism just described there is provided on the support a pair of transversely disposed storage tanks 38, 39, which preferably extend across the machine and above the service tank. Each of the storage tanks 38 and 39 is in communication with a suitable rotary pump of the reversible type indicated at 40, and either tank may be thrown into or out of communication with said pump by means of a suitable valve shown at 41. The pump is also in communication with the service tank through a pipe or conduit 42 extending to the bottom of said tank.

By this arrangement it is readily possible to put either tank 38 or 39 into communication through the pump with the service tank, or to close both storage tanks off from the service tank. As means for driving the pump and likewise propelling the scrubbing apron there is provided a suitable motor indicated as an electric motor 43 mounted on the base casting 35 and having its rotor shaft provided with opposed pinions 44, 45, between which a reversing clutch and lever 46 is mounted. The pinions 44 and 45 are in mesh with a pinion 47 secured to a stub shaft 48 journaled in the base casting 35 and having a spur gear

49 at its other end in mesh with the spur pinion 50 of the pump. As will be readily seen, this mechanism permits the pump to be driven in either direction. The rotor shaft of the motor extends outwardly and is provided with a sprocket wheel or pulley 51 driving a chain or belt 52 passing over a large sprocket or pulley 53 secured to the driving roller 22 whereby the apron is driven.

In connection with the electric circuit for the motor, there are provided a series of heating elements 54, 55, 56, which are attached to the bottom of the respective tanks and which may be thrown into circuit with the source of electric supply as by a switch 57 to heat or maintain the temperature of the fluid being used. A separate switch 58 controls the circuit to the motor. A suitable drain 60 is provided for the storage tanks.

It will be readily understood from the construction and arrangement of parts above described that a machine constructed in accordance with this invention will have a self contained supply of fluids of different character, as for instance, soap water and clear water, and that these may be readily interchanged between tanks by means of the pump 40, or the service tank drained of all fluid, if desired. For example, assuming the service tank to contain soap water and tank 39 to contain clear water, these may be interchanged by throwing tank 38 into communication with the service tank and driving the pump in a direction to raise the fluid from the service tank 38, after which the valve is thrown to put tank 39 into communication with the service tank and the pump operated to discharge clear water from tank 39 to the service tank. If it is desired to dry or mop up the floor, the service tank is left empty and will receive the water carried up by the apron and expressed therefrom by the wringer rolls, and this water can, if desired, be pumped into the desired storage tank. There is thus provided quick acting means for effecting such transfers of fluid as may be desired from tank to tank. There has accordingly been provided a machine in which there is combined the advantages of an efficient and improved scrubbing element and a novel and advantageous system of fluid supply to the service tank, and in which the mechanism is readily controllable by the operator of the machine. It will be understood that the structure or embodiment of the invention herein given is merely illustrative and that various modifications are possible within the scope of the invention as defined by the following claims.

What is claimed as new is:

1. In a mechanical scrubber, the combination of a movable support, a floor scrubbing element, a service tank supplying fluid to said element, a plurality of storage tanks, means for selectively putting any storage

tank into and out of communication with the service tank, and pumping means for transferring fluid from the service tank to and from any storage tank.

- 5 2. In a mechanical scrubber, the combination of a wheeled support, a water supplying tank on the support, a driven floor scrubbing element positioned to be supplied by said tank, a pair of storage tanks mounted on the support, a pump on the support, valve controlled conduits between each storage tank and the pump, a conduit extending from the bottom of the supply tank to the pump, a motor on the support, and driving connections between said motor and the scrubbing element and pump respectively including means for reversing the action of the pump.

In testimony whereof I affix my signature.

EDWARD A. JOHNSTON.

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