Aug. 20, 1963 W. F. GRAY 3,101,088

MOP WASHING MACHINES

Filed April 3, 1962 4 Sheets-Sheet 1

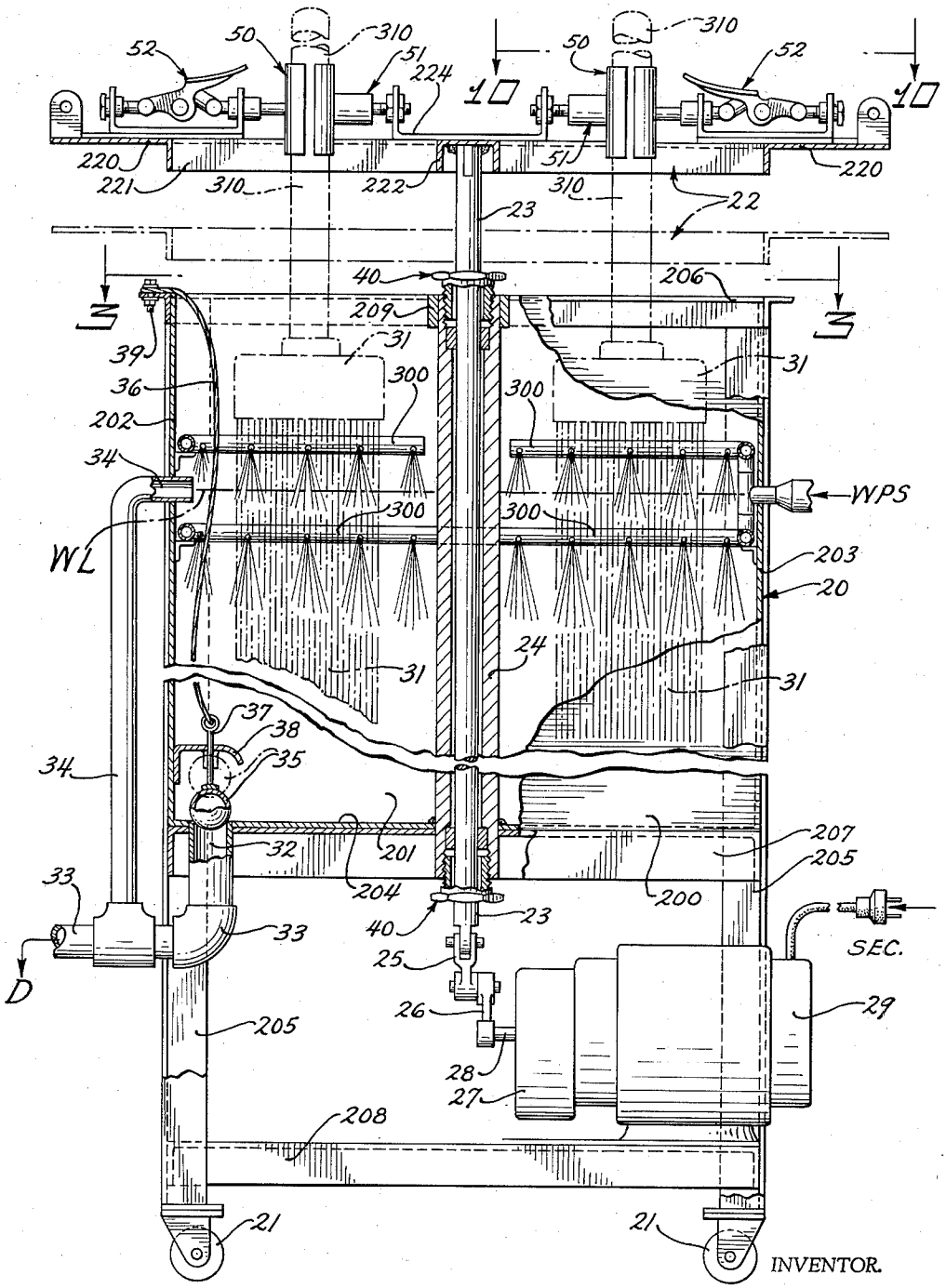


Fig. 1

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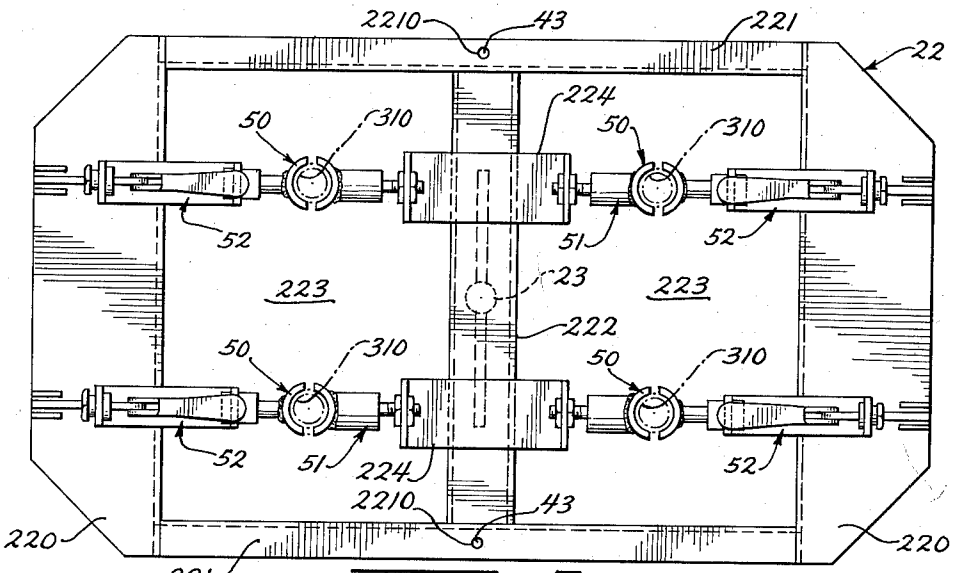


Fig. 2

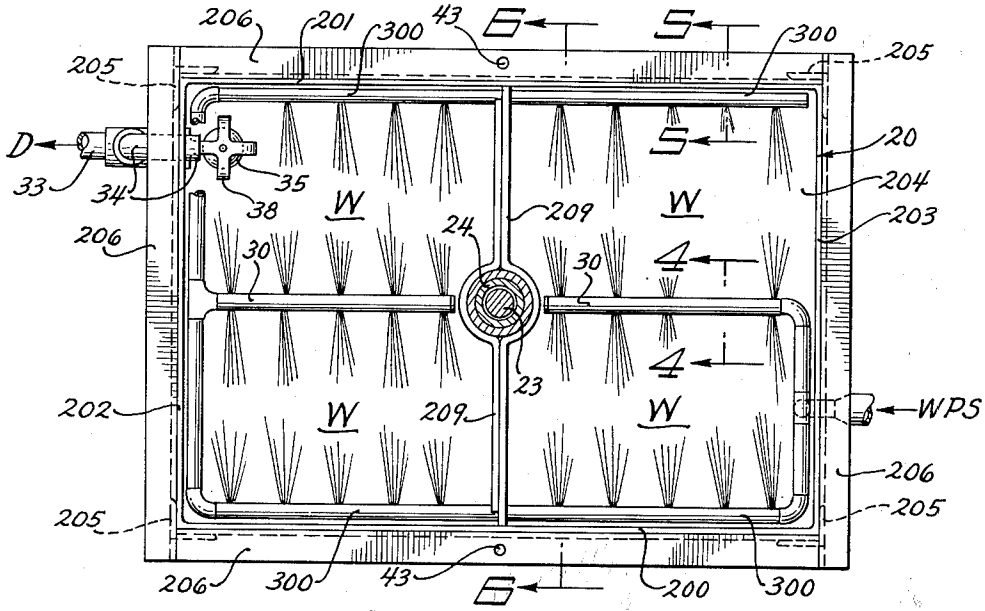


Fig. 3

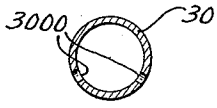


Fig. 4

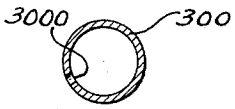


Fig. 5

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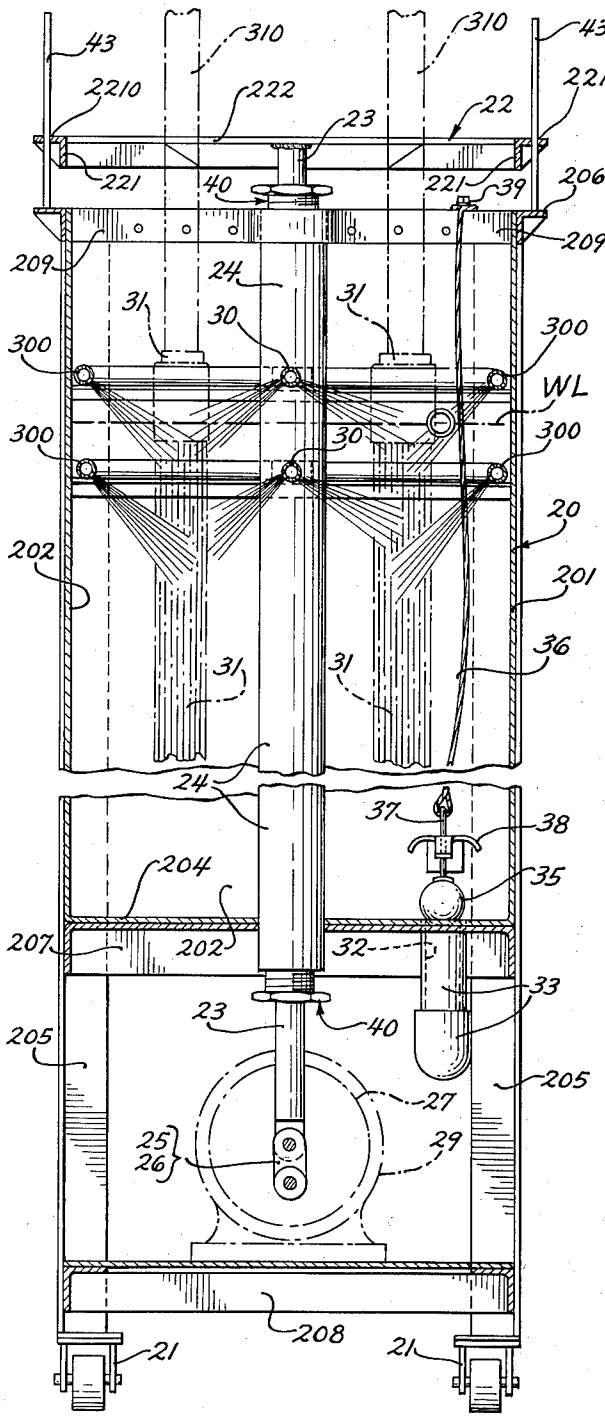


Fig. 6

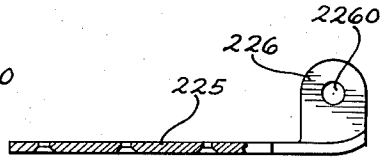


Fig. 7

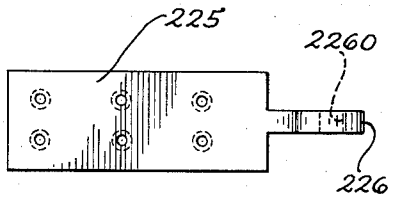


Fig. 8

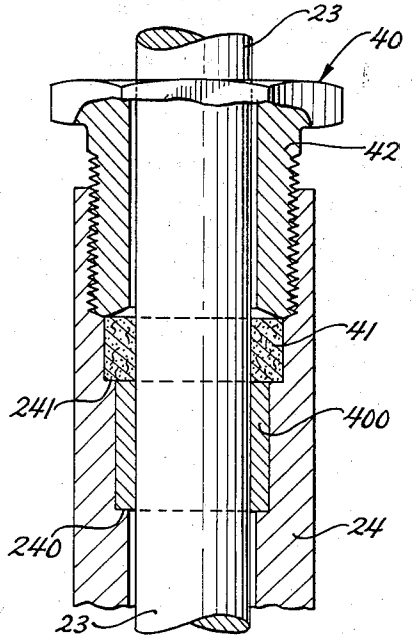


Fig. 9

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MOP WASHING MACHINES

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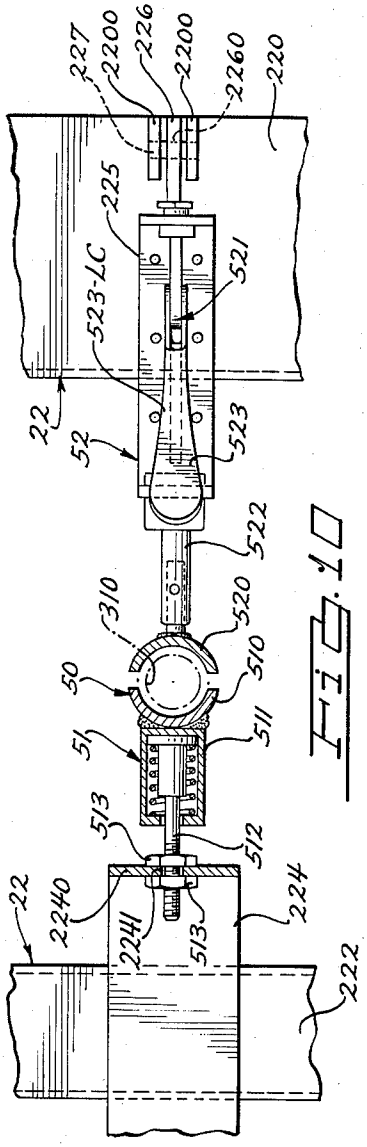


Fig. 10

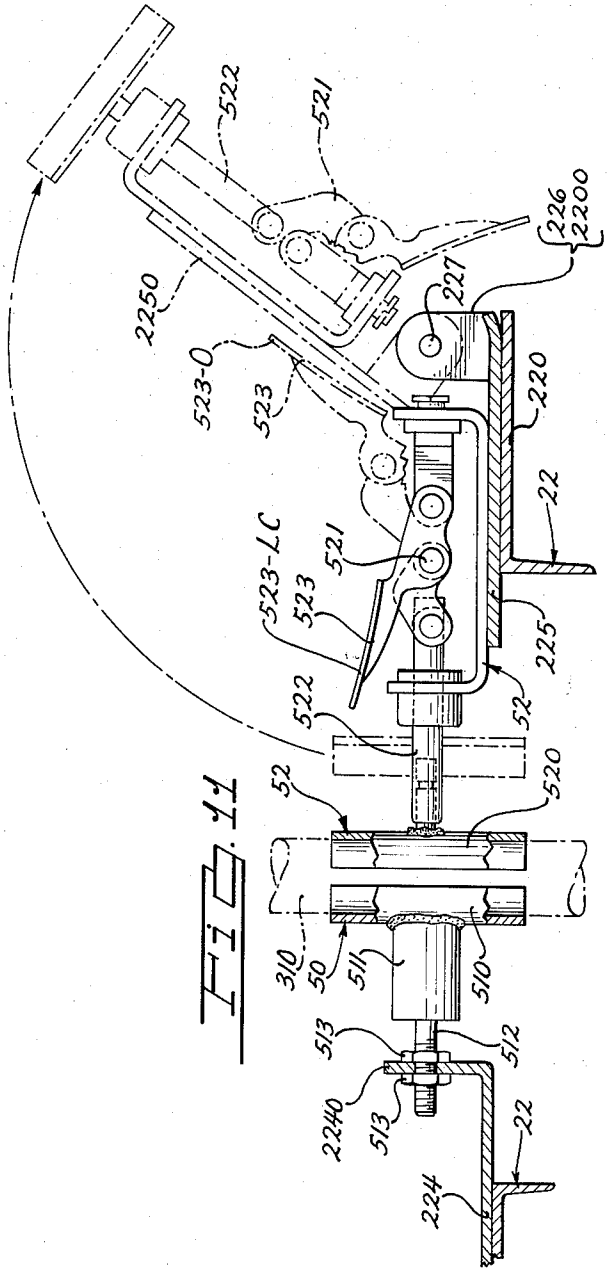


Fig. 11

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United States Patent Office 3,101,088
Patented Aug. 20, 1963

3,101,088

MOP WASHING MACHINES

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Filed Apr. 3, 1962, Ser. No. 184,873
8 Claims. (Cl. 134—151)

This invention relates to mop washing machines of the type particularly adapted for janitorial work in office buildings, public buildings, stores and the like wherein large areas of floors must be mopped daily—generally after normal closing hours.

Under conditions of mopping large areas, the mops become extremely dirty, and the normal individual wheeled mop bucket wherein the mop is rinsed and squeezed to eliminate excess water when the mopping operation is in progress does not properly clean an excess accumulation of dirt and grime from the mop.

The primary object of the instant invention is to provide an improved mop washing machine which will thoroughly clean one or a plurality of stranded cord type or like mops whereby to permit each of the cleaning personnel of a janitorial crew to periodically have his or her mop cleaned of dirt and grime during the course of any cleaning shift; the thorough mop cleaning being able to be accomplished rapidly in the general area of the usual janitor's closet while the conventional mop buckets are being emptied into the slop sink and refilled for additional use.

A further object of the invention is to provide an improved mop washing machine or mop cleaner which receives the mop, holds it by the mop handle, agitates the mop upwardly and downwardly in fresh water sprayed into the mop cleaner and onto the mop whereby to not only clean the mop but straighten out the cords thereof.

Other objects of the invention will become apparent by reference to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a longitudinal sectional view of a mop washing machine embodying the invention taken substantially on the line 1—1 of FIG. 3.

FIG. 2 is a top plan view showing the mop activator platform and quick releasable mop holding elements.

FIG. 3 is a horizontal sectional view taken on the line 3—3 of FIG. 1 showing the tub or tank portion of the mop washing machine and a preferred location of mop spray pipes.

FIGS. 4 and 5 are enlarged detailed sectional views taken respectively on the lines 4—4 and 5—5 of FIG. 3 showing the preferred location and direction of spray nozzle apertures in the spray pipes.

FIG. 6 is a cross sectional view taken substantially on the line 6—6 of FIG. 3.

FIG. 7 is a longitudinal view part in section and part in elevation of the mounting plate employed to hingedly mount the mop holding toggle mechanism on the mop activator platform.

FIG. 8 is a plan view of the mounting plate shown in FIG. 7.

FIG. 9 is an enlarged sectional view showing the upper bearing assembly preferably employed to mount and guide the mop activator platform support for vertical reciprocating movement.

FIG. 10 is an enlarged top plan view taken on the line 10—10 of FIG. 1 showing a quickly releasable mop holding means preferably employed.

FIG. 11 is a longitudinal sectional view of the mechanism shown in FIG. 10.

Referring now to the drawings wherein like reference numerals refer to like and corresponding parts throughout the several views, the mop washing machine embodying the invention disclosed for illustrative purposes comprises a tank 20 preferably mounted on casters 21 for convenient

mobility, a mop activator platform 22 supported for vertical reciprocation above the said tank 20 by such means as a push rod 23 guided in a vertically disposed stanchion 24 and connected by a link 25 and crank arm 26 to the rotating shaft 28 of a speed reducer 27 driven by an electric motor 29. Although not shown in the drawings, the electric motor 29 is connected through a suitable On-Off switch to a source of electric current SEC.

The tank 20 is provided with a source of water under pressure WPS including the usual On-Off valve (not shown), which source of water is piped within the tank 20 to suitably located spray elements 30 and 300 which direct a pressure spray diagonally downwardly against the broad sides of stranded cord type or like mops 31 removably held firmly by their handles 310 by quickly releasable mop holding assembly 50 carried by the mop activator platform 22 as hereinafter described in detail. The center spray elements 30 have two rows of spray apertures 3000 therein as best shown in FIG. 4, and the side spray elements 300 have a single row of spray apertures 3000 therein. The location of the spray apertures 3000 in the spray elements 30 and 300 determines the diagonally downward direction of the pressure spray against the mops 31.

The tank 20 preferably consists of two sides 200 and 201, two ends 202 and 203, a bottom 204, corner posts 205, an upper flange 206, bottom supports 207, and a lower post stiffener frame 208. The casters 21 are suitably secured to the bottom of the corner posts 205. The entire tank and framing as shown, together with the other mechanism herein described, provides a conveniently portable mop washing machine. Obviously other portable or stationary tank construction may be employed in practicing the invention.

The said tank 20 is provided with a sump 32 which discharges through a drain outlet 33 to a drain or slop sink (not shown). An overflow 34 is provided in a wall of the tank 20 at a proper elevation to assure the substantially complete immersion of the mops 31 in water in the tank 20 during the cleaning cycle, and yet prevent the water level WL from exceeding a predetermined height. The overflow 34 is connected to the drain outlet 33 preferably outside the tank 20. The sump 32 is provided with a float valve ball 35 thereover controlled by a thong or chain 36 connected to the float valve ball 35 by means of a guide rod 37 disposed through a cage 38 fixed to a wall of the tank 20 at a suitable distance above the bottom of the said tank 20. The upper end of the said thong or chain 36 is fixed by suitable means to the top of the tank 20 for convenience.

The stanchion 24 is vertically disposed centrally within the tank 20 and extends in sealed relationship through the bottom 204 thereof, and is braced in its vertical position by a transversely disposed strap iron collar assembly 209 located at the top of the said tank 20. The push rod 23 upon which the mop activator platform 22 is centrally mounted by welding or the like is guided for vertical reciprocation by upper and lower packing nut type sleeve bearing assemblies 40 as best shown in FIGS. 1 and 9. The tank 20 is, in effect, divided by the strap iron collar assembly 209 and the spray elements 30 and 300 into four mop wells W, one for each of four mops supported on a mop holding element carried by the mop activator platform 22 and disposed centrally above each said mop well W.

Each said bearing assembly 40 preferably consists of a bearing element 400, an oiler seal element 41 and an anchor nut 42. The inner periphery of each end of the stanchion 24 is bored, counterbored and threaded to accommodate the bearing element 400 against a shoulder 240, the oiler seal element 41 against a shoulder 241, and the anchor nut 42 against the oiler seal element 41. The bearing element 400 and the oiler seal element 41 fit with generous tolerance around the push rod 23 to provide a

minimum of friction therebetween consistent with maintaining a vertical alignment of the push rod 23.

The mop activator platform 22 preferably consists of a pair of angularly formed end plates 220, a pair of side angles 221 and a transverse central channel 222 welded together to form a rigid mop activator platform 22 having a pair of large rectangular openings 223 each to accommodate the insertion of two mops 31 therethrough into mop wells W in the tank 20 with their handles 310 extending upwardly and above the said mop activating platform 22. Obviously, a mop washing machine of the invention may be made of different size and shape to accommodate one or any number of mops; two-, four- or six-mop capacity being preferably for general use. The said mop activator platform 22 as disclosed employs four quickly engageable and releasable mop holding elements 50 as hereinafter described.

Extending upwardly from the upper flange 206 of the tank 20 and at each side thereof is a guide rod 43 which telescopes through a suitable aperture 2210 in the side element 221 of the mop activator platform 22. These guides maintain the mop activator platform 22 aligned with the tank 20 therebelow. Obviously, other guide means for guiding the mop activator platform 22 may be substituted for the guide rods 43.

The mop activator platform 22 of the particular embodiment of the invention disclosed herein is provided with four quickly engageable and releasable mop holding assemblies 50, one for each of the mop wells W of the tank 20 and located to suspend a mop 31 by its handle 310 centrally of a mop well W. Each mop holding assembly 50 as best shown in FIGS. 10 and 11 preferably consists of a fixed mop handle clamp element 51 and a toggle mop handle clamp element 52. The transverse central channel 222 of the mop activator platform 22 is provided with a pair of short longitudinal plates 224 thereacross which are welded thereto, the said plates 224 having their ends bent upwardly at 2240 to receive and support a fixed mop handle clamp element 51.

Each of said fixed mop handle clamp element 51 preferably consists of a vertically disposed arcuate mop handle clamp shoe 510 mounted on one end of a spring pot 511, the piston rod 512 of which extends through an aperture 2241 provided in the upturned end 2240 of a said short longitudinal plate 224 of the mop activator platform 22. An anchor nut 513 threaded on the piston rod 512 each side of the upturned end 2240 of the longitudinal plate 224 secures the fixed mop handle clamp element 51 in its adjusted position according to the largest diameter of mop handles 310 of the particular mops 31 being washed. The spring pot 511 need not be described in detail inasmuch as it is of conventional construction. If some of the mop handles 310 of the mops 31 to be washed in the mop washing machine are under-size, the spring pots 511 will take up the difference, and each mop 31 will be held securely on the mop activator platform 22 by a mop holding clamp assembly 50 with the handle 310 of the mop 31 depending in its proper washing position in a mop well W of the tank 20 of the mop washing machine.

Each toggle mop handle clamp element 52 is preferably bolted or otherwise fixed to a hinged mounting plate 225 including a vertically disposed tongue 226 at the outer end thereof suitably apertured at 2260 to receive a hinge pin 227 extending transversely through a pair of suitable vertically disposed hinge lugs 2200 welded to the top of an angular end plate 220 of the mop activator platform 22. Each toggle mop handle clamp element 52 consists of a conventional toggle clamp mechanism 521 which reciprocates a plunger 522 responsive to manual movement of its operating lever 523 from its Open position at 523–O to its Locked Closed position at 523–LC. On the end of the plunger 522 is mounted a vertically disposed arcuate mop handle clamp shoe 520, which, when the operating lever 523 of the toggle clamp mechanism 521 is in its

Closed position at 523–LC, the handle 310 of a mop 31 is firmly and securely gripped between the clamp shoe 510 of the fixed mop handle clamp element 51 and the clamp shoe 520 of the toggle mop handle clamp element 52, thus removably holding the mop 31 by its handle to the mop activator platform 22 with the mop 31 depending in the mop well W therebelow, all as best shown in FIGS. 1, 10 and 11.

As best shown in FIG. 11, to remove a mop 31 from the mop activator platform where it is securely clamped by a mop holding clamp assembly 50, the operating lever 523 of the toggle clamp mechanism 521 of the toggle mop handle clamp element 52 is moved from its Locked Closed position 523–LC to its Open position 523–O which retracts the plunger 22 thereby releasing the grip on the mop handle 310 by the clamp shoes 510 and 520 of the fixed and toggle mop handle clamp elements 51 and 52. The entire toggle mop handle clamp element 52 including its hinged mounting plate 225 is then swung from its Normal Horizontal position indicated in full lines in FIG. 11 about the hinge pin 227 to a Clearance position as indicated by the dot and dash lines 2250 in FIG. 11 to provide suitable clearance to admit of manual removal of a cleaned mop 31 by its handle 310 from a mop well W of the mop washing machine.

Inasmuch as the toggle clamp mechanism 521 is of conventional construction and is illustrated clearly in FIGS. 10 and 11, it has not been described in detail except insofar as it forms a part of the toggle mop handle clamp element 52. It is obvious that means may be employed other than the mop holding clamp assemblies 50 for supporting and removably fixing mops 31 by their handles 310 to the mop activator platform 22 of a mop washing machine embodying the invention with the mops depending in the mop wells W of the tank 20 thereof.

When a mop washing machine embodying the invention is placed in use, the spray elements 30 are connected to a valved source of water under pressure WPS, and the drain outlet 33 is connected to a drain D. A mop 31 is then placed in one or more of the mop wells W at the proper elevation so that water sprayed from the spray elements 30 will impinge upon the mop 31 when the mop washing machine is in operation. The mop 31 is removably fixed by its handle 310 to the mop activator platform 22 by means of the toggle mop handle clamp element 52 which is swung from its Clearance position 5210 to its Normal Horizontal position shown in FIG. 11, the operating lever 523 the toggle clamp mechanism 521 being in its Open position 523–O. The toggle clamp mechanism 521 is then locked by moving the operating lever to its Locked Closed position 523–LC best shown in FIGS. 10 and 11.

A valve (not shown) in the source of water under pressure WPS is opened to provide a pressure spray from the spray elements 30 against the mop 31. Power is provided from a source of electric power EPS through a suitable switch (not shown) to the electric motor 29 which is turned to an On position as soon as the pressure spray is started, or just before. The float valve ball 35 over the drain outlet 33 prevents drainage from the tank 20, and, as a typical mop cleaning cycle progresses, the mop 31 is first sprayed by a diagonally downwardly directed pressure spray and then churned in the water from the pressure spray accumulating in the tank 20. When the tank 20 is filled to its overflow 34, the float valve ball 35 is lifted by the thong or chain 36, and the water in the tank 20 drains therefrom through the drain D.

After the mop or mops 31 have been thoroughly cleaned, the motor switch is turned Off, and the valve in the water pressure supply WPS is closed. The mop 31 is then removed from the mop washing machine by first moving the operating lever 523 of the toggle clamp mechanism 521 to its Open position, then swinging each toggle mop handle clamp element 52 to its Clearance position 5210, and then manually removing the cleaned mop 31

by its handle 310 from the mop washing machine. Obviously one to four mops may be cleaned during any mop washing cycle of the mop washing machine embodying the invention, and the typical mop washing cycle hereinabove described may be varied according to the requirements of the mops to be washed and the preference of the machine operator. If desired, a suitable preferably non-sudsing detergent may be added to the tank 20 during any mop washing cycle. The mop washing machine of the invention not only cleans cord type mops, but also untangles most, if not all, of the strands thereof during a mop washing cycle of operation thereof.

Although but a single embodiment of the invention has been disclosed and described in detail, it is obvious that many changes may be made in the size, shape, capacity, arrangement and details of the herein described structure illustrating the invention, all without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. In a mop washing machine for stranded cord type mops,

a tank element including water inlet means at the upper portion thereof, a drainage sump in the bottom thereof, a sump valve, and an overflow means establishing a suitable water level in said tank, a mop activator platform above said tank, means supporting and vertically reciprocating said mop activator platform,

quickly releasable mop holding assemblies carried by said mop activator platform holding said mops in a vertical position with the strands thereof depending in said tank for churning in the water therein responsive to the vertical reciprocation of said mop activator platform,

each said mop holding assembly including a fixed and a toggle mop clamp element releasably engaging and holding a mop at a selected elevation in respect to said mop activator platform.

2. In a mop washing machine for stranded cord type mops mounted on a handle,

a tank element including a pressure water spray inlet means at the upper portion thereof and a drainage sump in the bottom thereof,

a mop activator platform above said tank,

means supporting and vertically reciprocating said mop activator platform,

quickly releasable mop holding assemblies carried by said mop activator platform holding said mops in a vertical position with the strands thereof depending in the path of the pressure water inlet spray means,

drainage sump valve means permitting the accumulation of water in said tank,

overflow means establishing a suitable level of water in said tank whereby to permit said mops to be churned therein,

each said mop holding assembly including a fixed and a toggle mop handle clamp element releasably engaging and holding a mop by its handle at a selected elevation in respect to said mop activator platform.

3. In a mop washing machine for stranded cord type mounted on a handle,

a tank element including a pressure water spray inlet means at the upper portion thereof and a drainage sump in the bottom thereof,

a mop activator platform above said tank,

means supporting said mop activator platform in vertically reciprocating spaced relationship above said tank, quickly releasable mop holding elements carried by said mop activator platform holding said mops by their handles in a vertical position in said tank with the strands of said mops depending in the path of the pressure water inlet,

each said mop holding assembly including a fixed and a toggle mop handle clamp element releasably engaging and holding a mop by its handle at a selected elevation in respect to said mop activator platform,

means vertically reciprocating said mop activator platform a limited distance to bring the upper and lower portions of the mop strands alternately in the path of the pressure water inlet spray,

drainage sump valve means permitting an accumulation of water in said tank,

and overflow means establishing a suitable level of water in said tank whereby to permit said mops to be churned therein.

4. In a mop washing machine for stranded cord type mops mounted on a handle,

a tank element including a pressure water spray inlet means at the upper portion thereof and a drainage sump in the bottom thereof,

a mop activator platform above said tank,

means supporting said mop activator platform in vertically reciprocating spaced relationship above said tank,

quickly releasable mop holding assemblies carried by said mop activator platform holding said mops by their handles in a vertical position in said tank with the strands of said mops depending in the path of the pressure water inlet,

each said mop holding assembly including a fixed and a toggle mop handle clamp element releasably engaging and holding a mop by its handle at a selected elevation in respect to said mop activator platform,

and means vertically reciprocating said mop activator platform a limited distance to bring the upper and lower portions of the mop strands alternately in the path of the pressure water inlet spray.

5. In a mop washing machine for stranded cord type mops,

a tank element including water inlet means at the upper portion thereof, a drainage sump in the bottom thereof, a sump valve, and an overflow means establishing a suitable water level in said tank, a mop activator platform above said tank,

a vertically disposed hollow stanchion disposed in sealed relationship through the bottom of said tank and extending to the top thereof,

push rod means disposed through said stanchion supporting said mop activator platform thereon,

means engaging said push rod vertically reciprocating said push rod and the mop activator platform thereon,

quickly releasable mop holding means carried by said mop activator platform holding said mops in a vertical position with the strands thereof depending in said tank for churning in the water therein responsive to the vertical reciprocation of said mop activator platform,

each said mop holding assembly including a fixed and a toggle mop handle clamp element releasably engaging and holding a mop by its handle at a selected elevation in respect to said mop activator platform.

6. In a mop washing machine for stranded cord type mops mounted on a handle,

a tank element including a pressure water spray inlet means at the upper portion thereof and a drainage sump in the bottom thereof,

a mop activator platform above said tank,

a vertically disposed hollow stanchion disposed in sealed relationship through the bottom of said tank and extending to the top thereof,

push rod means disposed through said stanchion supporting said mop activator platform,

means engaging said push rod vertically reciprocating said push rod and the mop activator platform thereon,

quickly releasable mop holding assemblies carried by

said mop activator platform holding said mops in a vertical position with the strands thereof depending in the path of the pressure water inlet spray means,

drainage sump valve means permitting the accumulation of water in said tank,

overflow means establishing a suitable level of water in said tank whereby to permit said mops to be churned therein,

each said mop holding assembly including a fixed and a toggle mop handle clamp element releasably engaging and holding a mop by its handle at a selected elevation in respect to said mop activator platform.

7. In a mop washing machine for stranded cord type mops mounted on a handle,

a tank element including a pressure water spray inlet means at the upper portion thereof and a drainage sump in the bottom thereof,

a mop activator platform above said tank,

a vertically disposed hollow stanchion disposed in sealed relationship through the bottom of said tank and extending to the top thereof,

push rod means supporting said mop activator platform in vertically spaced relationship above said tank,

quickly releasable mop holding elements carried by said mop activator platform holding said mops by their handles in a vertical position in said tank with the strands of said mops depending in the path of the pressure water inlet,

each said mop holding assembly including a fixed and a toggle mop handle clamp element releasably engaging and holding a mop by its handle at a selected elevation in respect to said mop activator platform,

means engaging said push rod vertically reciprocating said mop activator platform a limited distance to bring the upper and lower portions of the mop strands alternately in the path of the pressure water inlet spray,

drainage sump valve means permitting an accumulation of water in said tank,

and overflow means establishing a suitable level of water in said tank whereby to permit said mops to be churned therein.

8. In a mop washing machine for stranded cord type mops mounted on a handle,

a tank element including a pressure water spray inlet means at the upper portion thereof and a drainage sump in the bottom thereof,

a vertically disposed hollow stanchion disposed in sealed relationship through the bottom of said tank and extending to the top thereof,

a mop activator platform above said tank,

push rod means supporting said mop activator platform in vertically reciprocating spaced relationship above said tank,

quickly releasable mop holding assemblies carried by said mop activator platform holding said mops by their handles in a vertical position in said tank with the strands of said mops depending in the path of the pressure water inlet,

each said mop holding assembly including a fixed and a toggle mop handle clamp element releasably engaging and holding a mop by its handle at a selected elevation in respect to said mop activator platform,

and means engaging said push rod vertically reciprocating said mop activator platform a limited distance to bring the upper and lower portions of the mop strands alternately in the path of the pressure water inlet spray.

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