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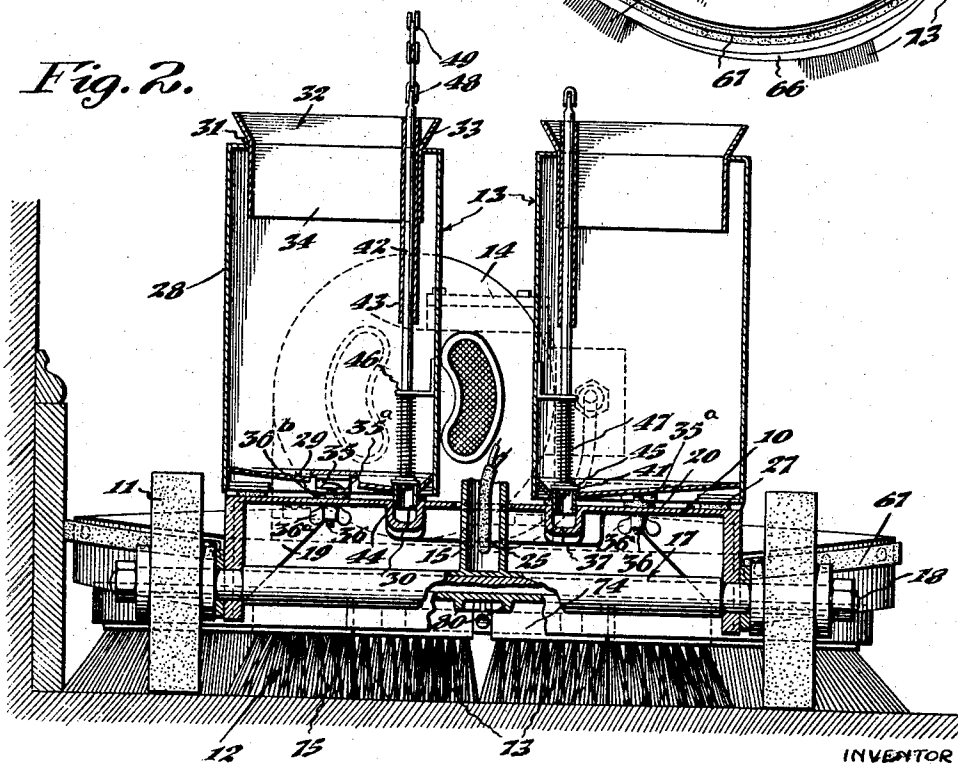
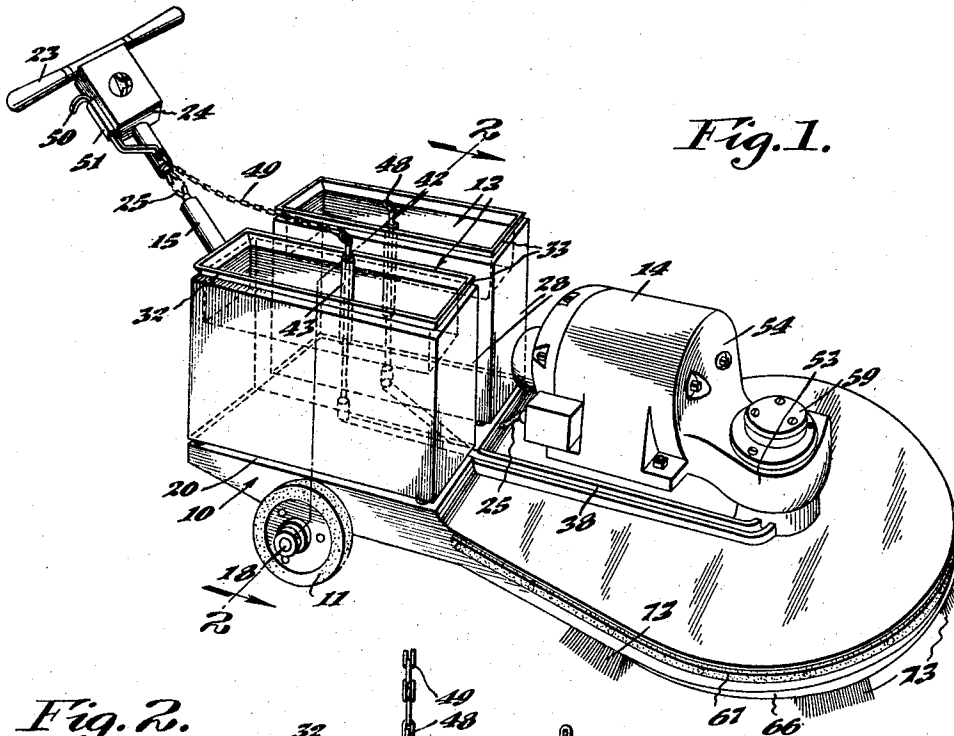
V. H. MENKHAUS

1,878,508

FLOOR SCRUBBING MACHINE

Filed Oct. 29, 1931

3 Sheets-Sheet 1



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Fig. 3.

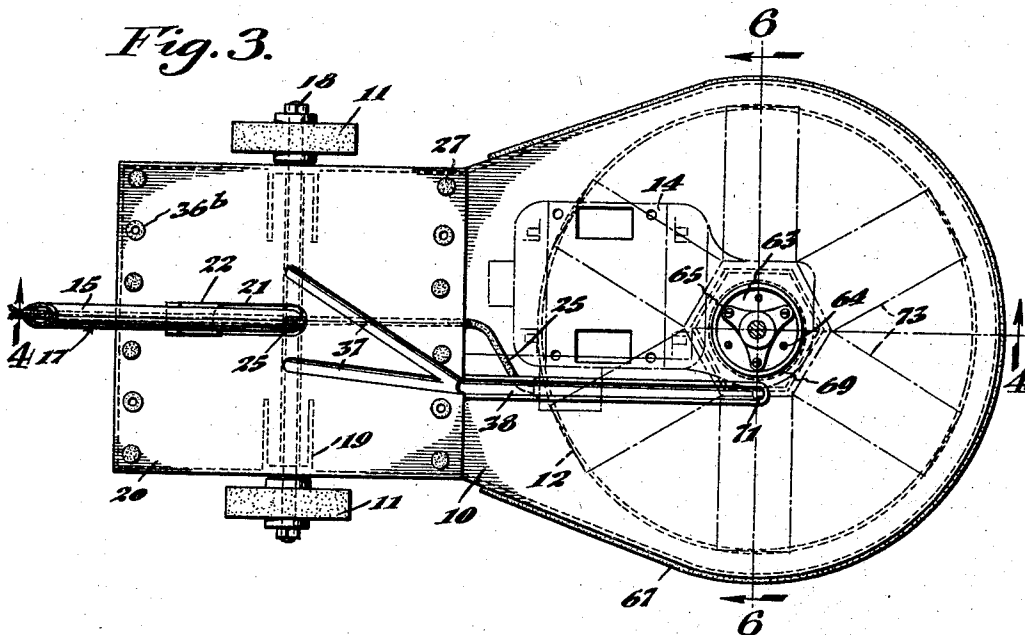


Fig. 5.

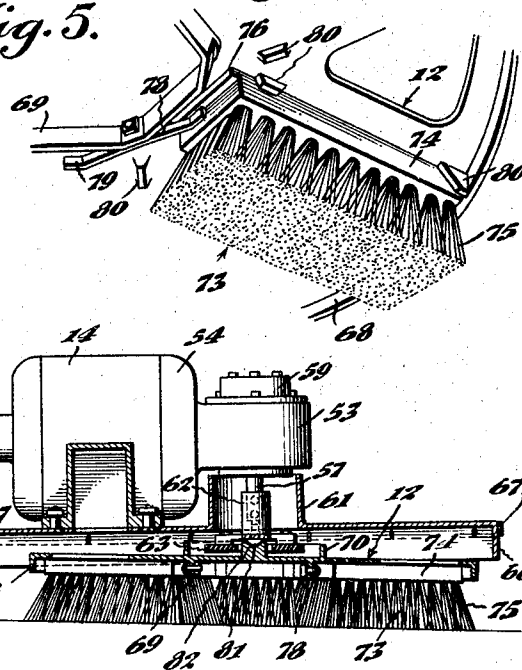
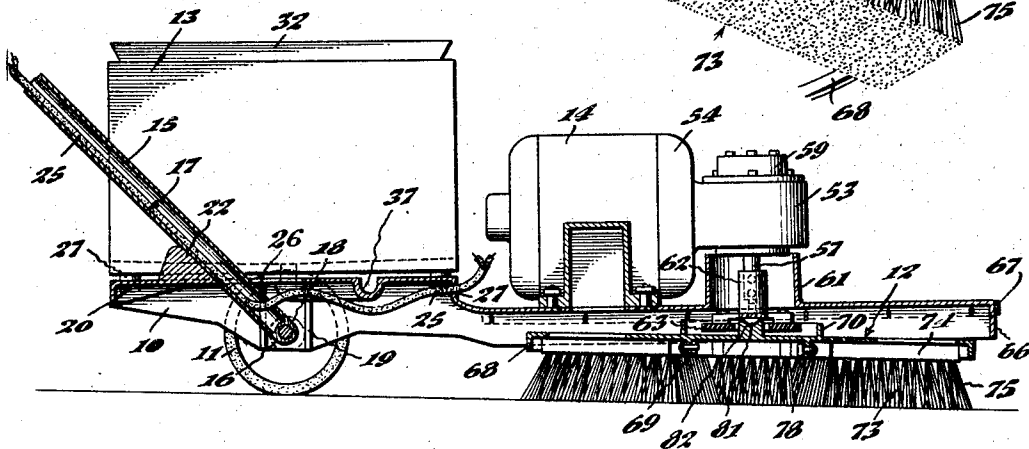


Fig. 4.



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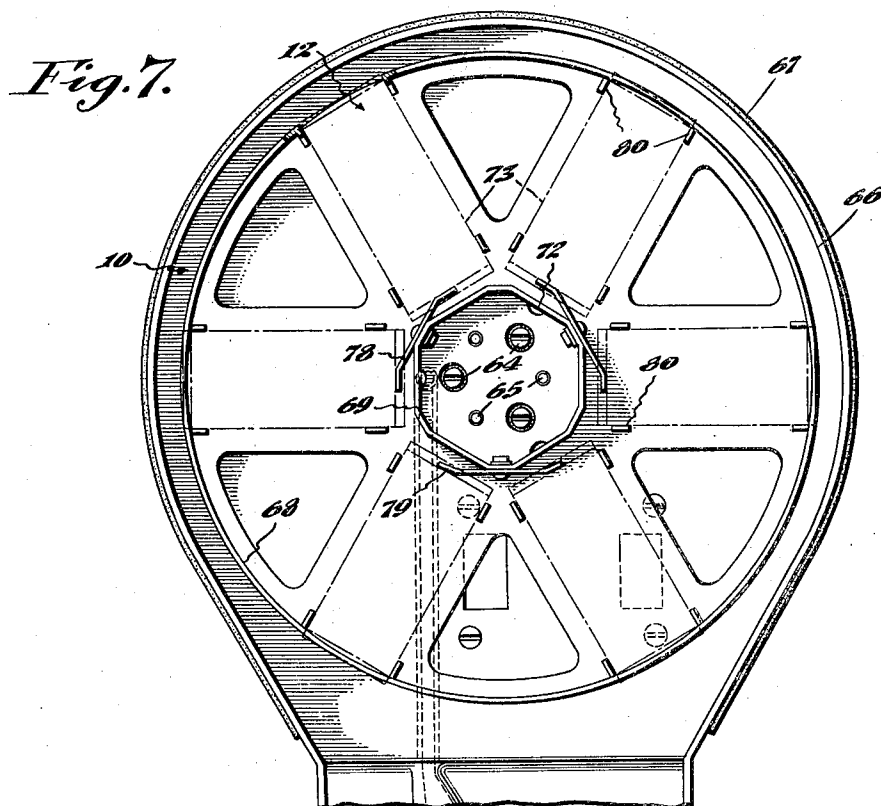
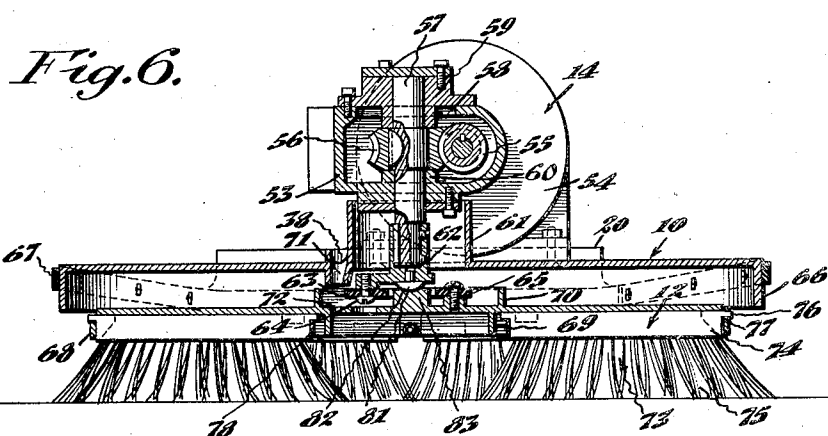
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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FLOOR SCRUBBING MACHINE

Application filed October 29, 1931. Serial No. 571,834.

This invention relates to cleaning apparatus and is particularly directed to a machine for scrubbing floors.

It is an object of this invention to provide improvements in floor scrubbing machines in which greater facility is provided for scrubbing close up to the baseboard or in close quarters and wherein the scrubbing unit is effective for faster scrubbing operations because of the greater spread of the brush unit accomplishing greater sweep in a given stroke.

It is another object of this invention to provide a machine of this character in which the water supply tanks are interchangeable and are quickly and easily removable, and wherein the water supply feed means from the tanks to the brushes is formed in such wise that the opportunity for clogging is considerably lessened and in the event of stoppage the passageways may be cleaned without dismantling any parts.

It is a further object to provide an improved handle and axle arrangement for this type of machine using a single axle at the rear wherein the handle is associated with the truck body so as to permit convenient tipping and raising of the brush unit at the forward end of the machine from the floor.

A still further object is to provide an improved machine of this type wherein the brush holder is mounted on a flexible driving connection whereby the brushes may adjust themselves to engage uniformly against the floor despite a canting of the truck body relative to the floor and wherein the brushes are all reversible in their mounting so that in the event of undue wear at one end or side thereof they may be turned end for end and quickly fastened by means of an improved attachment means.

Other objects and certain advantages will be more fully apparent from a description of the accompanying drawings, in which:

Figure 1 is a perspective view of the improved floor scrubbing machine.

Figure 2 is a sectional view taken on line 2—2, Figure 1, illustrating the water tanks and their control valves as well as the truck construction of the machine.

Figure 3 is a top plan view of the truck of the machine with the tanks and motor removed for the purpose of clearer illustration.

Figure 4 is a sectional view taken on line 4—4, Figure 3, further detailing the structure of the truck and of the brush unit.

Figure 5 is a fragmentary perspective view of the underside of the brush ring or holder, illustrating a brush thereof in position.

Figure 6 is a sectional view taken on line 6—6, Figure 3, further detailing the brush unit and illustrating the drive thereto.

Figure 7 is a bottom view of the truck and brush holder with the brushes removed for illustrating the brush attaching means.

Generally described, the machine of the present invention comprises a truck 10 having wheels 11 at one end and carrying a brush unit 12 at the opposite end. Supply tanks 13 are mounted upon the truck and the water therefrom is fed under control to the brushes. A motor 14 is mounted upon the truck for driving the brush unit. The machine is propelled by means of a handle 15 and the motor control and tank outlet control are readily accessible at the handle.

Referring specifically to the drawings, the truck 10 is square at its rear end and circular at its forward end, being flared outwardly from the rear end to the forward end to provide a mounting and casing for a large circular brush unit 12 for a wide scrubbing range. The truck includes a single axle 18, this axle being mounted in the rear of the truck through the side flanges thereof, the flanges at this point being reenforced by ribbing 19. The truck is adapted to be pivoted on its wheels 11 mounted on the axle 18 for raising or lowering the brush unit by means of a tubular T-shaped element 17 having its head traversed by the axle for pivotal support and its shank extending upwardly and rearwardly for forming a handle 15. This handle extends through a slot 21 in the platform.

The truck frame includes a boss or lug 22 cast therewith on the top side, this boss or lug being of concave form on its upper surface for fitting the round handle extension

and providing a saddle or rest therefor. The handle normally rests, due to its weight, in a rearwardly inclined position against this boss. When the operator desires, he may

5 rock the truck on its rear axle for raising the brush unit from the floor by exerting a downward pressure on the handle, the boss 22 providing the necessary contact for the leverage action.

10 The head of the T-shaped element extends the entire distance with a very slight clearance between the side flanges of the truck and the T-shaped element may, therefore, be inserted upwardly during assembly and the

15 axle passed therethrough for securing it in place. The full width engagement of the head provides a stable mounting for the handle for steering and rigidifies the axle.

The wheels 11 may be of a yieldable or 20 soft composition or may have treads of a yieldable material for protection to the flooring. The handle is arranged between respective water tanks 13 which are mounted on a platform or rest portion 20 at the rear

25 end of the truck. These tanks may be a clear water or rinse water tank and a detergent or soap solution tank respectively.

A handle or cross bar 23 is formed at the upper end of the handle. Motor control wiring 25 is extended through the tubular handle from a motor control or switch box 24 just below the cross bar, the wiring passing out of the lower end of the tube through an aperture 26 and under the platform through

35 an aperture 27 in the forward wall of the platform to the motor 14 which is mounted upon the forward end of the truck frame.

The water tanks 13 which are set side by side upon the platform, are conveniently removable and attachable relative to the platform as occasion demands. For the purpose of a quiet contact, the platform includes a number of rubber cushions 27, one for each corner of the respective tanks. The tanks are

45 interchangeable, being of the same identical structure.

Each tank 13 includes a main tank portion 28 of rectangular form, having its bottom 29 inclined to a discharge tube 30 for drainage purposes. The upper ends of the tanks are open and have inturned rims 31. Funnel members 32 are secured within these openings, providing tapered mouths 33 and depending apron portions 34 extending into the

55 tanks.

Each tank includes attaching brackets 35 disposed centrally of its ends, these brackets being rigidly attached to the tanks and including a flange 35^a through which is disposed

60 an attaching bolt or screw 36. These bolts are adapted to be passed through apertures in the platform and wing nuts 36^a are screwed onto the bolts or screws from underneath the truck frame. Rubber washers 36^b are inserted about the screws between the lug of

the tank and the platform for silencing the joint. Since the attaching devices are disposed centrally of the width of the tanks, it is apparent that the tanks are interchangeable.

The discharge tubes 30 in the false bottoms of the tank are adapted to fit into openings in the platform, which openings are at the beginning of channels or grooves 37 extending forwardly and joining at the forward edge 75 of the platform, thence continuing in a single channel 38 raised from the general surface of the motor support portion of the truck, this channel leading ultimately to the brushes for feeding the water thereto.

It will be noted at this time that the feed channel for the water from the tanks to the brushes, is open at the top and therefore is very easy to clean in case of clogging and does not necessitate dismantling of the machine to clean the same for clogged feed. This channel is very readily brushed out and feeding of the water or solution is therefore always efficiently accomplished.

Each tank includes a stopper or valve 41 90 for controlling the discharge flow of water through the tubes 30 into the channels. Each stopper assembly consists of a rod 42 slidably mounted in a tube 43 fixed to the side of the container, the lower end of the rod carrying the leather or rubber washer or stopper 41 adapted to rest upon the upper edge of the discharge tube 30. These washers or stoppers are fastened to the lower end of the rods by means of respective screws 44.

Between a washer 45, engaged upon each stopper element, and a retainer bracket 46 fixed to the wall of the tank and traversed by the rod is a spring 47 under compression normally urging the stopper into closed position relative to the outlet tube 30. The upper end of each rod extended above the tank, includes a rearwardly turned eyelet 48 to which may be attached one end of a control chain 49. This chain 49 has its other end attached to the lower end of a slidable release element 50 mounted in a guideway 51 fixed to the side of the switch box 24 on the handle 15. The chain may be fastened to either one of the rods for stopper control depending on the tank or container which is being used at the time.

The motor 14, to which the control wiring extends from the switch box, is bolted upon the rounded flared forward end of the truck frame and includes a transmission extended to the axis of the curved end of the truck. A transmission casing 53 as a part of the head 54 of the motor houses a worm 55 fixed 125 to the motor shaft and a worm wheel 56 fixed to a vertical shaft 57 connected to and driving the brush unit 12 which is mounted beneath the circular portion of the truck. The transmission casing 53 includes a large opening 130

58 in the top for insertion of the gearing and shaft and a bearing element 59 is fitted over the opening and attached to the housing for journalling the upper end of the brush holder driving shaft 57. The worm wheel is fixed to this shaft 57 by means of a key and rests upon a boss 60 of the casing for supporting the shaft and the brush holder and brushes which are fixed thereto.

The lower end of the stub shaft 57 extends into a large sleeve portion 61 extending upwardly as a part of the truck body and has a coupling element 62 attached thereto. This coupling element 62 is attached to the lower end of the shaft by means of a key and set screws. A series of radial extensions are formed as a part of the coupling element and a ring 63 of yieldable material is attached to the underside of this coupling element by means of screws 64 extending upward into the outer ends of the respective radial extensions.

The brush holder is carried by this ring 63 of yieldable material and is attached thereto by means of screws 65 staggered relative to the screws 64 attaching the ring to the coupling element 62 on the drive shaft. This arrangement provides a resilient coupling absorbing the starting shock and assuring a quiet drive with some universal movement such as is necessary due to the possible irregularity of the brushes and tilting of the truck frame relative to the brush unit.

That end of the truck frame which supports the brush unit, as has been stated before, is circular and flared from the tank supporting surface portion. As will be apparent from Figure 2, this enables the operator to manipulate the machine against baseboards. A circular flange 66 around this flared portion of the truck depends sufficiently for slightly surrounding the brush holder and overhanging the same. A buffer strip 67 of rubber or leather is secured around the outer face of the side flange.

The brush holder is circular and includes a depending outer flange 68 and a depending inner flange 69, between which flanges the brushes are secured through means hereinafter described. An upwardly disposed circular flange 70 is also provided coaxial with the brush holder surrounding the region adjacent the coupling forming a well adapted to receive the water from the water channel cast in the base or truck frame. For this purpose the water channel extends to a point adjacent the upstanding flange or sleeve 61 of the truck frame surrounding the coupling and includes a downward passageway 71 above and emptying into the well. From the well the water is free to flow through apertures 72 in the base of the well onto the floor and particularly the surface surrounded by the brushes.

A plurality of brushes 73 are mounted in

the holder, there being six shown in the present case substantially radially relative to the axis of the holder. Each brush includes a body 74 in which the bristles 75 are secured after the fashion of the common scrubbing brush. The body of the brush includes a lug 76 at each end along its entire upper edge. One of these lugs is adapted to extend through a slot 77 in the outer flange of the brush holder. Each brush is reversible end for end for the purpose of longer use. As the bristles wear toward the outer ends of the brushes, due to the contact with vertical surfaces or at the sides due to continuous rotation in a particular direction or as any other irregular wear occurs, the brushes may be reversed for further use.

The inner end of each brush is maintained in position against vertical displacement by means of a spring clip 78 secured to the inner flange of the brush holder, one clip serving for two brushes and having its respective ends 79 slightly turned and disposed substantially 60° apart. The brushes are disposed within a channel defined by depending lugs 80 cast with the holder, there being four lugs for each brush, two on each side.

It will be noted from Figure 4 that initially the forward end of the truck is slightly tilted relative to the floor since, when the brushes are new, the machine is calculated to function in this position. It is at this time that the flexible joint permits some canting of the holder relative to the motor drive shaft.

It will be observed from Figure 6 that the brush holder rests against a positive abutment in the form of a button 81 secured in the center of the underside of the coupling element and seated in a concave recess 82 in the top of the central lug 83 of the brush holder. The brush holder rocks on this button for the purposes of the tilting required when the brushes are new or when they have become worn and the angle of the truck body relative to the floor changes or is reversed.

Having described my invention, I claim:

1. In a floor scrubbing machine, a truck including a tank supporting surface toward its rear, a power driven scrubbing brush unit mounted toward the forward end of said truck, open water channels extending from said surface to said brush unit, and water supply tanks adapted to be disposed on said surface in outlet connection with said water channels.

2. In a floor scrubbing machine, a truck, a scrubbing brush unit mounted in and beneath said truck, means for driving said scrubbing brush unit, said truck including water feed grooves extending to said scrubbing brush unit, and water supply means for supplying water to said scrubbing brush unit through said water feed grooves.

3. In a floor scrubbing machine, a truck including a tank supporting surface, a power

driven brush unit mounted in and beneath said truck, supply tanks mounted on said surface, an axle mounted in said truck, and a T-shaped element having its head mounted on said axle and its shank extending upwardly and rearwardly between said tanks for constituting a truck manipulating handle.

4. In a floor scrubbing machine, a truck, an axle therefor, and a T-shaped element having its head mounted on said axle, the shank of said element extending upwardly and rearwardly and constituting the steering handle for the truck.

5. In a floor scrubbing machine, a rear wheeled truck including a plane surface toward its rear, a power driven brush unit mounted toward the forward end of said truck, water grooves extending across said plane surface to said brush unit, and tanks removably disposed on said plane surface including outlet connections with said water grooves.

6. In a floor scrubbing machine, a truck including a tank supporting surface, supply tanks mounted on said surface, a scrubbing brush unit mounted in and beneath said truck, said truck including water feed grooves extending from said tank supporting surface to said scrubbing brush unit, and disconnectible feed connections between said tanks and said water feed grooves.

7. In a scrubbing machine, a rear wheeled truck having a generally flat top and providing a platform for supporting water tanks and a rounded and flared forward end for housing and mounting a scrubbing brush unit, water tanks mounted on said platform, a power driven brush unit mounted in said forward end, and grooves disposed in the top surface of the truck for supplying water from said tanks to said brush unit, the brushes of said unit adapted to effectively contact the floor beyond the flared rounded end of the truck.

8. In a scrubbing machine, a truck including a platform at its rear end and a scrubbing brush unit mounted in its forward end, duplicate supply tanks mounted on said platform, grooves in the surface of said truck extending from said platform to said scrubbing brush unit, attaching devices on said platform and said tanks for removably fastening said tanks in position for water feed into said grooves.

9. In a scrubbing machine, a rear wheeled truck, water tanks mounted on said truck, a power driven brush unit mounted on said truck, a motor for driving said unit, and a flexible connection between said power and said scrubbing brush unit, said connection comprising a yieldable element disposed for taking driving thrusts, said motor fastened upon the truck surface and said scrubbing brush unit adapted to uniformly contact the floor, whereby said flexible connection per-

mits canting of the truck relative to the brush unit and the floor.

10. In a floor scrubbing machine, a truck, a scrubbing brush unit mounted in said truck, means for driving said scrubbing brush unit, water supply tanks on said truck, grooves in the surface of said truck extending from the tanks to the region above the scrubbing brush unit, said scrubbing brush unit including a rotary brush holder mounted beneath the truck frame, said brush holder having a well formed centrally thereof on its upper surface, said well including outlet ports in the bottom thereof, and said truck frame including a water feed passageway extending from the grooves for directing the water into said well.

In witness whereof, I hereunto subscribe my name.

VICTOR H. MENKHAUS.