Jan. 27, 1953 W. L. PETERSEN 2,626,412

RUG SCRUBBING MACHINE

Filed April 12, 1948 3 Sheets-Sheet 1

Fig. 4

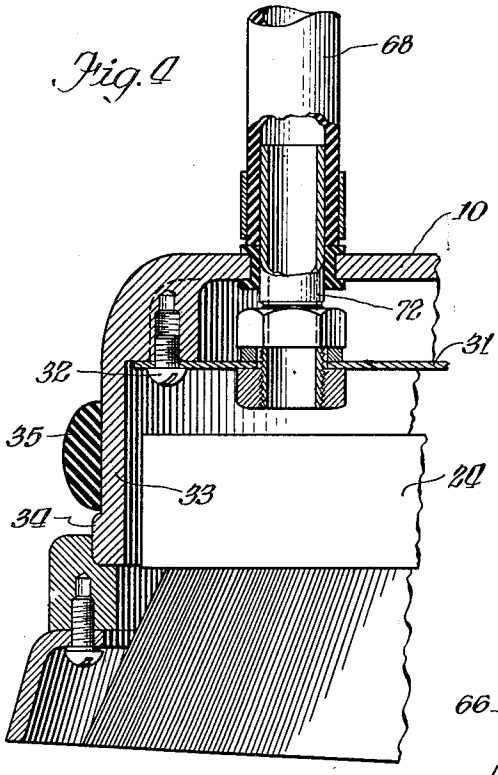

Fig. 1

Fig. 5

Inventor:
William L. Petersen
By: Clarence J. Loftus
Attorney.

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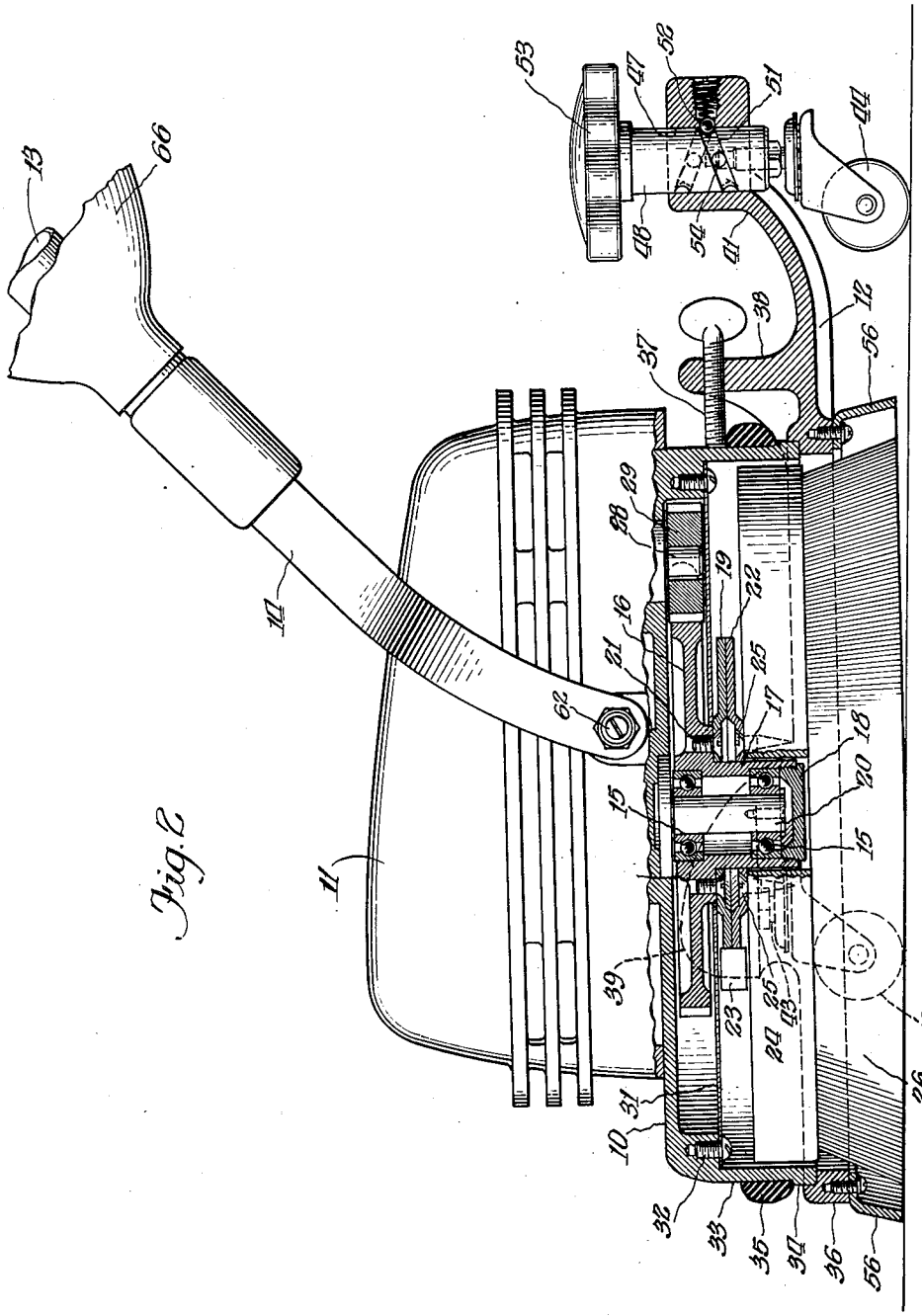

Fig. 2

Inventor:
William L. Petersen
By: Clarence J. Loftus
Attorney.

Jan. 27, 1953 W. L. PETERSEN 2,626,412

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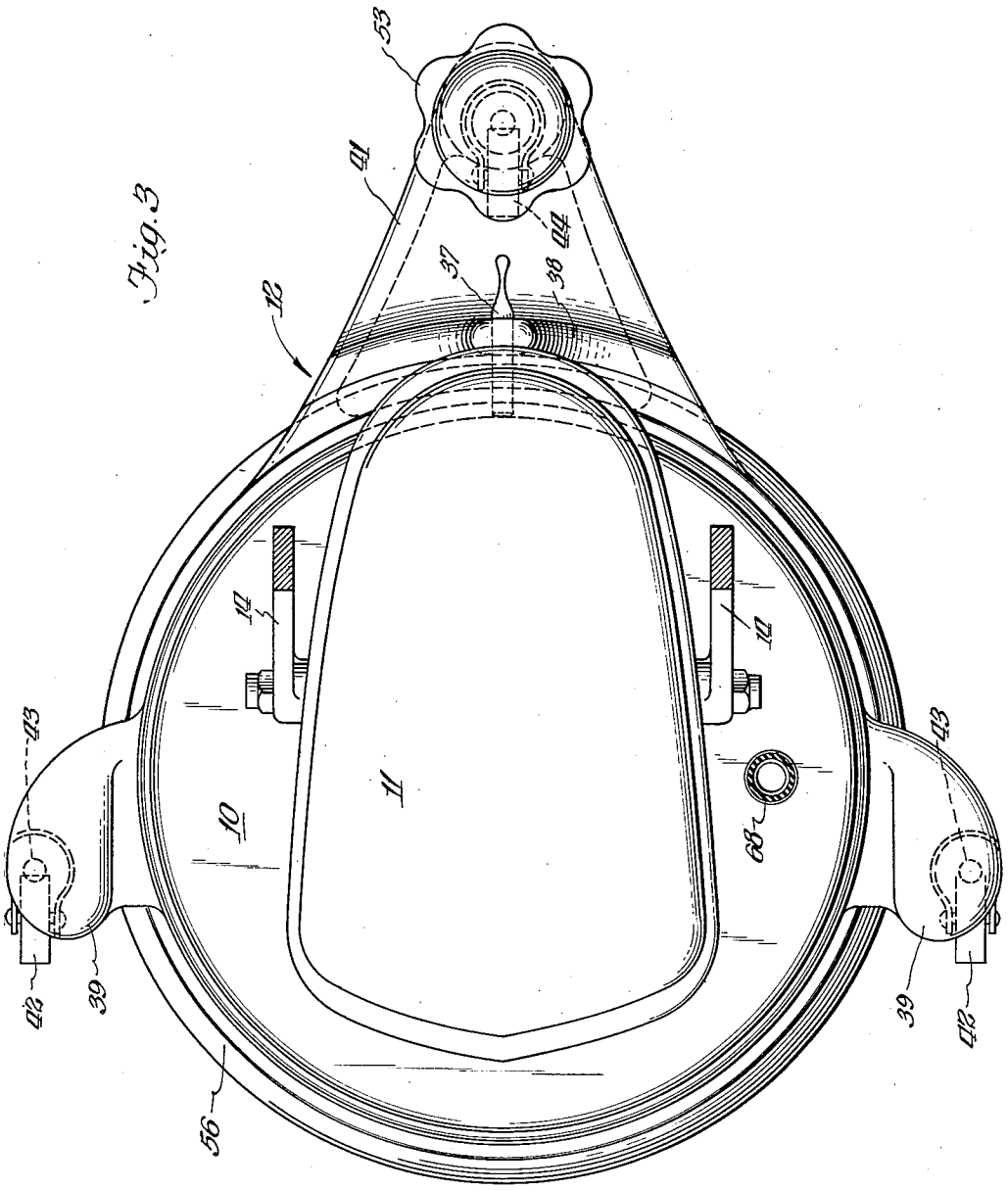
Fig. 3



Inventor:
William L. Petersen
By: Clarence J. Loftus
Attorney.

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RUG SCRUBBING MACHINE

William L. Petersen, West New York, N. J., assignor to Clarke Sanding Machine Company, Muskegon, Mich., a corporation of Michigan

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3 Claims. (Cl. 15—50)

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The present invention relates to a rug scrubbing machine and has, as its principal object, the provision of a portable rug scrubbing machine adapted to shampoo rugs on a floor surface, yet so designed as to be capable of unusual ease of control and to thus avoid the tendency of prior machines to move over the surface of the rug in an uncontrolled manner, as a result of the friction of the scrubbing brush on the rug.

A further object of the invention is to provide a machine, wherein a single motor-driven rotary brush is utilized as the scrubbing element, together with means for supporting the brush for rotation on a substantially upright, but slightly tilted axis, so that the brush engages the floor surfaces on one of its center sides only, and avoids the tendency of prior machines to creep or wander when in use.

A further object of the invention resides in the provision of a machine having the functional characteristics indicated, with means to facilitate easy adjustment of the precise angle of the axis of rotation to suit the machine to operation on rugs having varying thicknesses and different depths of nap.

A still further object of the invention resides in the provision of a rug scrubbing machine of flexible mechanical design, so that it may alternately be utilized as a scrubbing device with the brush and its driving means supported on a shiftable carriage and arranged to contact the rug surface lightly, but may also be utilized as a floor polishing device wherein the entire weight of the machine, including the machine brush, housing and driving motor is directly supported on a rotary polishing brush.

A still further object of the invention resides in the provision of a rug scrubbing machine including a machine housing, driving motor and speed reduction gearing supported on a traveling carriage to maintain the brush in precise angular relationship with the surface of the rug, together with guiding means including a manually operable handle pivoted to the machine and designed to include a reservoir of substantial capacity for the rug shampoo, with a liquid supply system including a manually actuated control valve to govern the flow of the shampooing liquid from the reservoir to the brush.

The manner in which the foregoing objects are accomplished in the present invention is best explained by reference to the drawings attached to and forming a part of the present specification, wherein:

Figure 1 is a side elevational view of a rug scrubbing machine, constructed in accordance with the teachings of this invention;

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Figure 2 is a fragmental side elevational view of the machine frame, motor housing, scrubbing brush and carriage, the view being partly in section through the center line of the brush.

Figure 3 is a plan sectional view of the frame casting and brush carriage of the machine;

Figure 4 is a detail sectional view taken substantially on the plane of the line 4—4 of Figure 1; and

Figure 5 is a fragmental view of the lower portion of the machine handle, showing the arrangement of the shampoo reservoir and control valves therefor.

The machine consists in general of a frame or brush carriage including a main casting 10, motor housing 11 and supporting cradle 12, together with an upwardly extending handle portion 13 pivoted to the carriage by a bifurcated yoke 14, so that an operator may conveniently guide the carriage over the surface of the floor. The main casting 10 has a fixed brush stud 20 mounted therein, and the stud carries a pair of bearings 15 on which the rotating parts of the brush assembly are mounted. The rotating assembly includes a spur gear 16 having a sleeve-like hub 17, in which the outer races of the bearings are seated, and in the preferred construction the lower end of the hub is closed by a plug 18. A generally flat brush mounting fitting or disc 19 is secured to the gear 16 by a plurality of machine screws 21, so that the disc rotates with the gear. The fitting 19 is in turn detachably joined to a mating disc 22 by interlocking clips 23, and the relatively rigid back plate 24 of the brush is secured to the disc 22 by the screws 25, so that the brush is secured to and carried by the disc, yet can be removed from the machine by disengaging the clips 23 to release the disc 22 from its mating disc 19. The bristles 26 of the brush extend downwardly to the floor surface, and while the bottom surface of the brush may be entirely flat, if desired, it has been found of advantage to trim the bristles in such a manner that the lower surface of the brush is slightly conical, in order that when the brush is supported on a slightly tilted axis, as shown, it will contact the floor surface only on one side of its center.

The brush is driven by an electrical motor carried within the housing 11 and arranged to act through any suitable speed reduction gearing to rotate a stub shaft 28 and thus drive the pinion 29, which is in mesh with the spur gear 16. A closure plate 31 is provided below the gears so

that foreign matter is excluded from the gear chamber, and the plate may be secured in position by a plurality of screws 32. The main casting 10 includes a downwardly extending flange 33 around the edges of the brush, and this flange is preferably provided with an annular bead 34 at its lower edge, with a rubber bumper strip 35 immediately above the bead.

The casting 10 is supported in the cradle 12, which includes a metal ring 36 extending completely around the lower edge of the flange 33 and interlocking with the bead 34, so that the two castings may be securely clamped together by tightening the thumb screw 37, mounted on an upwardly extending bracket 38 formed as an integral part of the cradle casting. The cradle casting also includes a pair of outwardly extending feet 39 at each side of the machine and slightly forward of the axis of rotation of the brush, and a rear caster bracket 41 at the back. A pair of casters 42 are mounted on vertical swivels 43 in each of the feet 39, so that the weight of the machine is supported largely on these forward casters, but partially on a caster 44 carried on a vertically adjustable mount located on the bracket 41 at the rear of the machine. For this purpose the outwardly extending bracket 41 is provided with a vertical bore 47, and a vertically shiftable adjusting stud 48 is mounted in the bore. The stud 48 includes a helical groove 51 in its outer surface, and a spring pressed ball detent 52 is provided in the wall of the bore 47 to ride in the groove, so that the stud may be screwed up or down by rotating the hand knob 53. The groove 51 is provided with a number of drilled ball sockets 54 at spaced points, however, and these sockets are of sufficient depth so that when the ball 52 seats in one of the sockets 54 the shaft will be held in position securely enough to support the weight it carries. A yieldable skirt 56 may be secured to the lower edge of the ring 36 to prevent the movement of the brush from splashing lather outwardly from the machine.

From the above, it will be seen that the weight of the machine does not rest primarily on the brush, but is supported on the side casters 42 and the rear caster 44. It is to be noted, however, that the vertical adjustment of the stud 48 permits the back of the machine to be raised or lowered with respect to the forward portion thereof, and thus permits a precise adjustment of the angularity of the axis of rotation of the brush, so that it may be set to contact the floor at the exact angle desired.

The handle 13 of the machine has its yoke 14 pivoted on a pair of studs 62 on the opposite sides of the motor housing 11, so that the operator may guide the machine manually by grasping the hand grips 65, but the handle, as shown, also includes a tank or reservoir for the shampoo. This reservoir comprises an enlarged cylinder or tank 66 concentric with the tubular handle 13, and extending from a point adjacent the yoke 14 upwardly approximately the full length of the handle. A filling orifice is provided at the upper end of the tank, with a closure cap 67. A flexible hose 68 is provided to permit the flow of liquid shampoo from the reservoir directly into the brush chamber of the machine. The upper end of the hose 68 leads from a manually operable valve 69, connected to the lower end of the reservoir 66 through the petcock 71 to an inlet fitting 72, extending through the top of the casting 10 and through the plate 31 to discharge the liquid shampoo directly on the brush. The valve 69 is manually controlled by a pull rod 73, extending upwardly from the valve through a bracket 74 and terminating in a knob 75 immediately below one of the hand grips 65. Thus, in operation the operator may easily guide the machine in its movement across the floor by holding it by the hand grips and at the same time control the flow of shampoo by manipulation of the knob 75.

It is to be particularly noted, however, that since the weight of the machine is not carried by the brush, but is primarily supported by the casters 42 and 44, which are angularly adjustable with respect to each other, the tendency of prior scrubbing machines to wander over the rug surface in an uncontrollable manner is largely avoided and the usefulness and efficiency of the machine is accordingly increased. It is also to be noted that this construction and arrangement of parts permits the machine cradle, including the casters and flexible skirt carried thereby, to be entirely removed from the main casting of the machine if desired; and it follows that it is entirely practicable to remove this mechanism, substitute a waxing or polishing brush for the scrubbing brush, and utilize the machine as a floor polishing device.

The form of the device herein disclosed and illustrated in the present drawings is the present preferred commercial embodiment of the teachings of this invention and represents the preferred form in which the inventive concept is now commercially utilized. It is to be recognized, however, that the scope of the inventive thought is not limited to the precise structure shown, but extends equally to any variation or modification thereof, coming within the scope of the appended claims.

Having thus described the invention, what I claim as new and desire to protect by United States Letters Patent is:

1. In a rug scrubbing machine having a main frame, the combination of a brush housing on said frame, a flat circular scrubbing brush having a relatively rigid back plate rotatably mounted in said housing, with the bristles of the brush extending downwardly therefrom, and with a circular rim on the housing surrounding the rigid back plate of said brush; means for rotating the brush, and a supporting cradle constructed and arranged to hold the bristles of the brush above a floor and in predetermined fixed angular relationship therewith; said cradle consisting of a circular ring having a pair of feet on opposite sides thereof, an outward extension projecting therefrom, and a caster on said outward extension; with an adjustable ring tilting support constructed and arranged to raise and lower one side of said ring with respect to said caster; said tilting support being mounted on said ring and including a manually operable hand control thereon; the ring having a flexible skirt surrounding the brush, and having on its upper surface an annular surface receiving the rim of the brush housing, together with at least one mounting bracket extending from the ring upwardly above the rim of the brush housing, and manually releasable means mounted on and extending inwardly from said bracket and engaging the sides of the brush housing above its rim and securing the rim of the brush housing in position on the ring.

2. In a rug scrubbing machine having a main frame, the combination of a brush housing on said frame, a flat circular scrubbing brush hav-

ing a relatively rigid back plate rotatably mounted in said housing, with the bristles of the brush extending downwardly therefrom, and with a circular rim on the housing surrounding the rigid back plate of said brush; means for rotating the brush, and a supporting cradle constructed and arranged to hold the bristles of the brush above a floor and in predetermined fixed angular relationship therewith; said cradle consisting of a circular ring having a pair of feet on opposite sides thereof, an outward extension projecting therefrom, and a caster on said outward extension; with an adjustable ring tilting support constructed and arranged to raise and lower one side of said ring with respect to said caster; said tilting support being mounted on said ring and including a manually operable hand control thereon; the ring having a flexible skirt surrounding the brush, and having on its upper surface an annular surface receiving the rim of the brush housing, together with manually releasable means securing the rim of the brush housing in position on the ring.

3. A supporting cradle for a rug scrubbing machine constructed and arranged to hold the bristles of the scrubbing machine brush above a floor and in predetermined fixed angular relationship therewith; said cradle consisting of a circular ring having a pair of feet on opposite sides thereof, an outward extension projecting therefrom, and a caster on said outward extension; with an adjustable ring tilting support constructed and arranged to raise and lower one side of said ring with respect to said caster; said tilting support being mounted on said ring and including a manually operable hand control thereon; the ring having a flexible skirt adapted to

surround the brush of the scrubbing machine, and having on its upper surface an annular surface to receive the rim of the brush housing of said machine; together with at least one mounting bracket extending upwardly from the ring and manually releasable means mounted on and extending inwardly from said bracket and adapted to engage the scrubbing machine and secure it in position on the ring.

WILLIAM L. PETERSEN.

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