

Aug. 4, 1942.

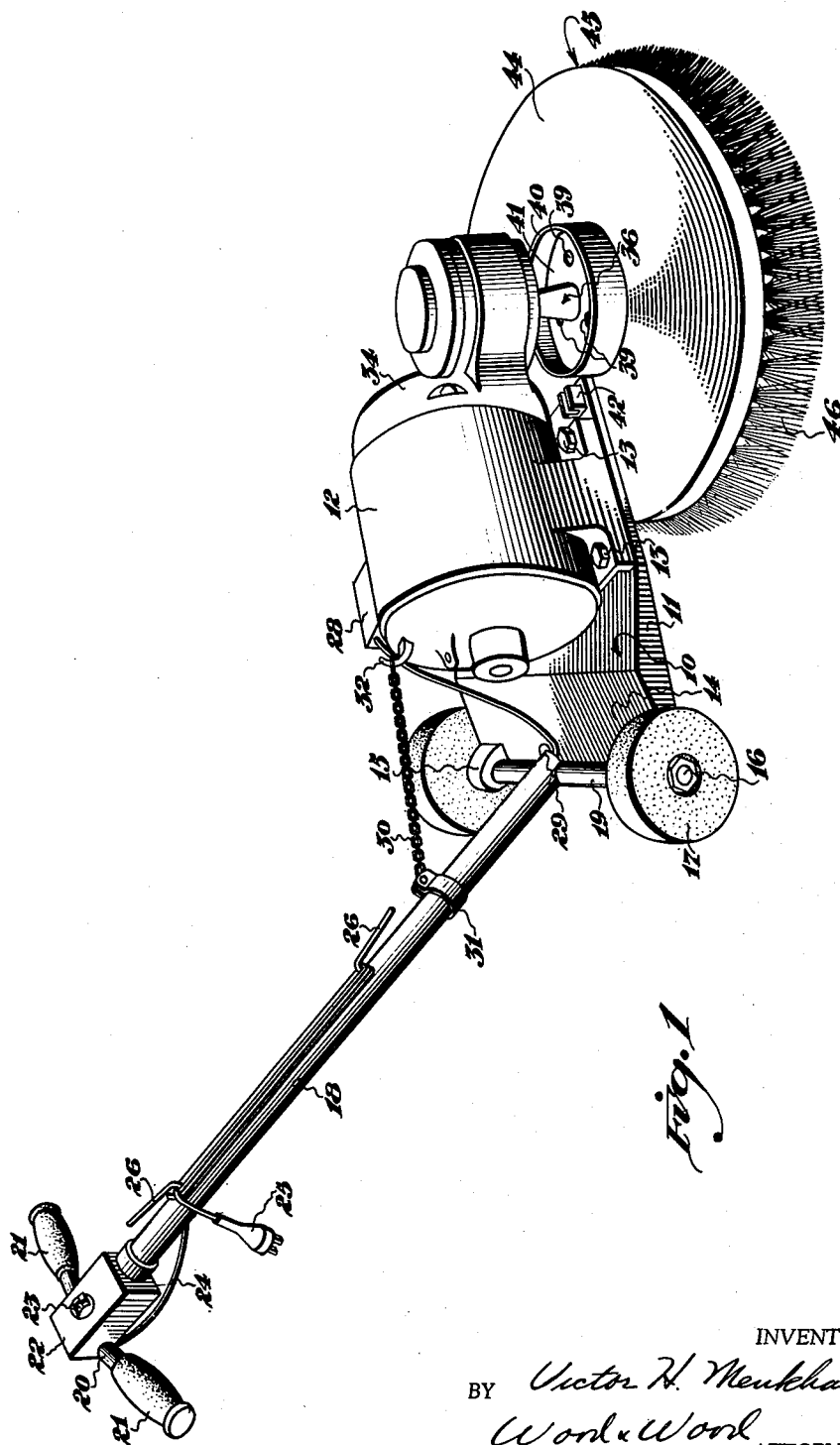
V. H. MENKHAUS

2,291,740

FLOOR SCRUBBING DEVICE

Filed Dec. 12, 1938

2 Sheets-Sheet 1



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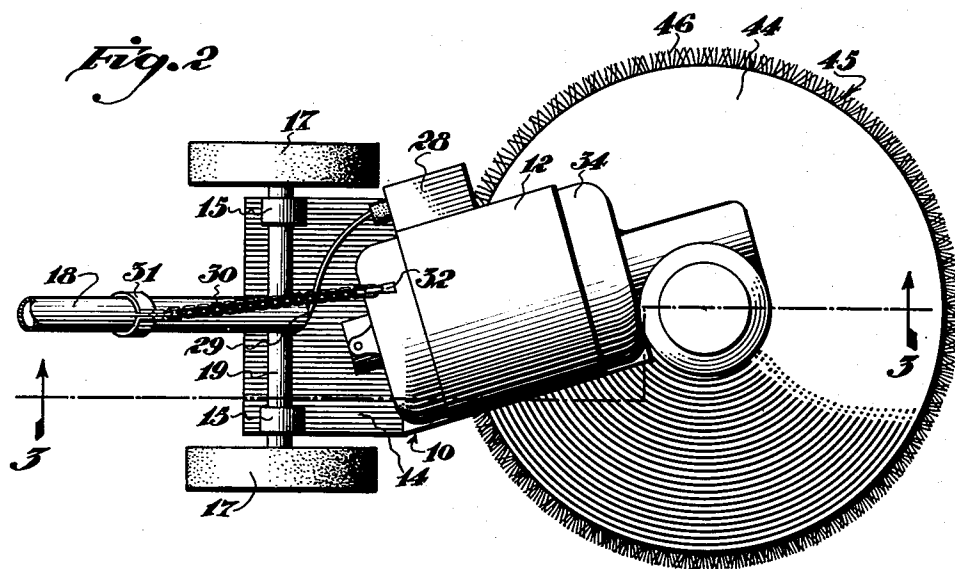
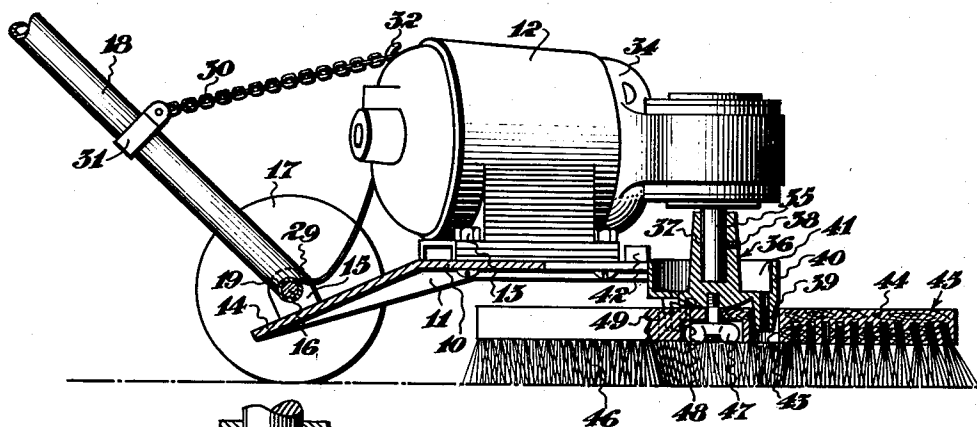
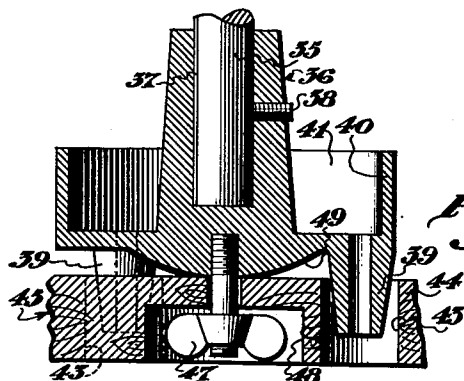
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FLOOR SCRUBBING DEVICE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,291,740

FLOOR SCRUBBING DEVICE

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2 Claims. (Cl. 15-50)

This invention relates to cleaning apparatus and is particularly directed to an improved floor scrubbing machine. The invention also deals with the use of the machine with other driven parts such as sanders, waxers, polishers, etc.

Heretofore, power driven machines of this character have been unduly heavy, hard to handle, and extremely difficult to clean. Moreover, considerable difficulty has been experienced in properly delivering the water to the brush, as in a scrubbing machine, as well as in removing the brush for cleaning or for interchange with other parts. Because of the very nature of the use to which the equipment is put, it follows that considerable dirt accumulates on the apparatus and this must be periodically removed. The floor scrubbing apparatus of the past has included water tanks and control valves. Also, no thought has been given to arranging the machine so that it was properly balanced for either direction of drive and in this respect facilitating handling and directing of the machine in the operation.

It has been the object of the present inventor to provide an improved power driven apparatus for scrubbing, polishing, sanding, or for any other allied use which accomplishes one or more of the following results: facilitates cleaning of the apparatus, due to a structural arrangement eliminating unnecessary obstructions; provides means for supplying water to a scrubbing unit without the necessity for a tank mounted directly on the apparatus; mounts the brush, sander, or polisher in a simple manner for universal movement; provides for delivery of the water through the scrubbing brush and rotative connection of the brush to the driving means through a novel coupling arrangement; greatly simplifies the structure by incorporating the motor and gear case unit rigidly in one casing; disposes the motor and gear case unit at the correct angle to balance the weight when the driven element is running clockwise or counterclockwise; provides means for varying the angle of the handle to suit the height of the operator; disposes the handle gripping means at the correct angle for convenient operation; and provides an exceedingly simple arrangement for extending the electrical cords to the motor through the handle, eliminating, in this respect, unnecessary drilling.

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 machine.

Figure 2 is a top plan view of the machine with a portion of the handle broken away.

Figure 3 is a sectional view taken on line 3-3, Figure 2, detailing the general construction of the machine.

Figure 4 is a fragmentary sectional view enlarged out of Figure 3, showing the details of the connection of the driven element and the drive means.

Generally described, the machine provides a base, a motor and gear casing unit mounted on the base, a coupling, a rotary scrubbing brush in the present instance, wheels at the rear of the base, and a handle for propelling the machine.

Referring to the drawings, the base is generally indicated at 10 and consists of a substantially flat plate having a virtually unobstructed underside except for reinforcing ribs 11 along its side edges. The base provides a horizontal portion upon which the motor 12 is mounted and attached by means of bolts 13. The rear portion of the base slopes slightly as indicated at 14 and includes a pair of lugs 15, one at each side thereof, extending upwardly from the surface of the plate. An axle 16 is disposed through these lugs and carries rubber composition wheels 17 on its extended ends.

The handle 18 is formed of tubing in the form of a T, the head 19 of which is traversed by the axle and disposed between the lugs. The upper end of the handle is provided with a crossbar 20 having rubber grip elements 21 at each end thereof. A switch box 22, incorporating a switch 23, is provided at the juncture of the handle and the crossbar. An extension cord 24 extends from this box and carries a plug 25 on its end for attachment to any floor socket which may be available. This extension cord, when not in use as shown in the drawings, is reeled about a pair of spaced prongs 26 along the handle. The electrical leads extend from the switch box down through the tubing and project from the tubing at the juncture of the head or axle engaged end thereof from whence they extend to the terminal box 28 of the motor.

In order to avoid boring of the shank of the handle, the handle element is of larger tubing than the head portion through which the axle is engaged and is welded to the head with its axis offset from the axis of the head. Thus, when the welding is complete, a portion of the end of the pipe is left open as indicated at 29 and the electrical leads extend out of this opening.

The handle is held in fixed relation with respect to the base and motor by means of a chain 30, having one end coupled to a clip 31 on the handle and the other end hooked over a prong 32 cast on the motor head.

The transmission or gearing unit, which consists preferably of a worm and worm wheel (not shown) is formed as a part of the head 34 of the motor and projects laterally therefrom, disposing the axis of the worm wheel in a vertical plane. The motor is set on the base at an angle so that the axis of the drive shaft 35 or the worm wheel is disposed on the central line of the base and handle (see Figure 2). Thus it makes no difference which way the rotary scrubbing brush is running insofar as the balance of the machine is concerned.

If the motor were straight and the axis of drive were offset from the center of the machine, the distribution of weight would be uneven and the machine would tend to hang over on one side. If the drive of the scrubbing element happened to be in a direction tending to shift the weight in this same direction, it would make the machine difficult to handle and the tendency would be for the scrubbing to take place on one side of the brush only. The normal tendency to shift, due to the scrubbing action, is not sufficient to cause this irregularity of scrubbing if the weight is evenly distributed and this is the result achieved by the arrangement shown. Thus, it makes no difference whether the brush is running clockwise or counterclockwise. The machine is always in substantial balance.

Other means, hereinafter described, aid in providing a uniform scrubbing action. Now, as shown in detail in Figure 4, the coupling or driving element 36 has its hub socketed upon the lower end of the drive shaft 35. A key 37 prevents relative rotation of the shaft and element and a set screw 38 holds the element against longitudinal displacement.

This element provides three downwardly projected teats 39. These teats are evenly circumferentially spaced and are fed from a receptacle formed on the top of the element by an angular flange 40. The water is delivered to the receptacle, indicated at 41, through a conventional hose engaged in a slotted element 42. The end of the hose is disposed in the receptacle. This hose is not shown but will be readily understood as of conventional form.

These teats not only function as the means for feeding the water to the brush, but have the added function of providing a coupling connection between the driving element and the brush. They

enter vertical apertures 43 in the base or body portion 44 of the brush 45. The brush 45 provides the conventional bristles 46 projecting from its entire underside, with the exception of the central portion into which the water is delivered. The brush is held upon the driving element by means of a wing nut 47, screwed upon a threaded stud projecting downwardly from the central axis of the driving element. The wing nut is contained within the countersunk portion 48 of the base of the brush. The wing nut is never tightened to the point where it binds the brush in position, but a certain amount of play is permitted so that the brush may rock relative to the stud. This occurs without interference from the driving element. The rocking action is assisted by the engagement of the brush with a convex portion 49 of the coupling.

Having described my invention, I desire to be limited only by the following claims:

1. A floor scrubbing machine providing, a base, wheels at the rear of the base, a motor driven unit mounted on the base and having a vertical shaft, a dished coupling element fixed to the shaft providing downwardly extended rigid teats circumferentially arranged around the coupling, a rotary scrubbing brush providing apertures into which said teats enter loosely, the relationship of said teats and apertures providing the rotary driving connection between the coupling and the scrubbing brush, and means axially loosely attaching the coupling and the brush, for holding the brush loosely in position, said coupling providing a convex underside against which the brush engages, whereby the brush is free to rock on the coupling.

2. A power driven floor scrubbing machine comprising a base of substantially flat plate construction having a substantially unobstructed underside, said plate providing a normally horizontally disposed forward portion and a slightly inclined rear portion, a shaft journaled on said base above the upper surface of the rear portion thereof, wheels on said shaft for supporting the rear of said base, a motor mounted on the horizontally disposed forward portion of said base and including a transmission unit extended forwardly therefrom as a unitary part of the motor, said transmission unit overhanging the forward end of the base and including a vertically downwardly disposed driving shaft, a rotary scrubbing brush mounted on the lower end of said vertically downwardly disposed driving shaft having its axis disposed on the longitudinal center line of the base, and means for propelling said machine.

VICTOR H. MENKHAUS.