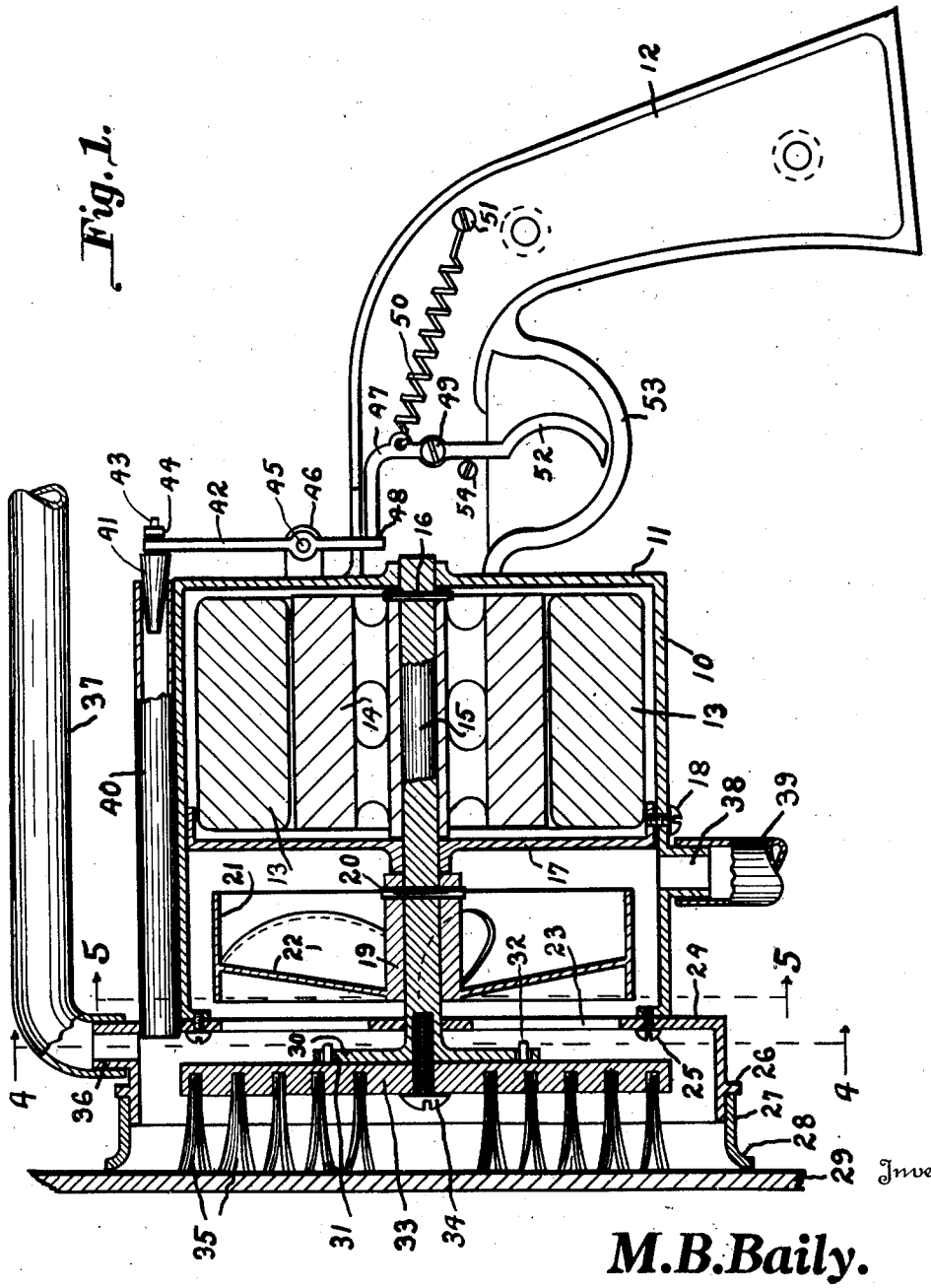
May 3, 1927. 1,627,263

M. B. BAILY

SCRUBBING MACHINE

Filed Oct. 2, 1925 3 Sheets-Sheet 1

Fig. 1.



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Filed Oct. 2, 1925 3 Sheets-Sheet 2

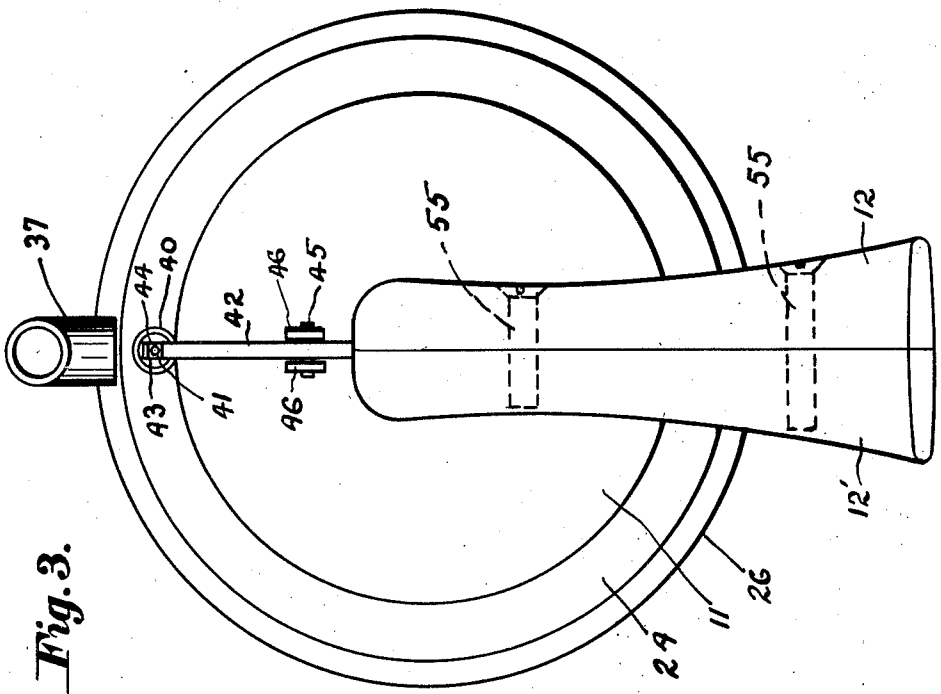

Fig. 3.

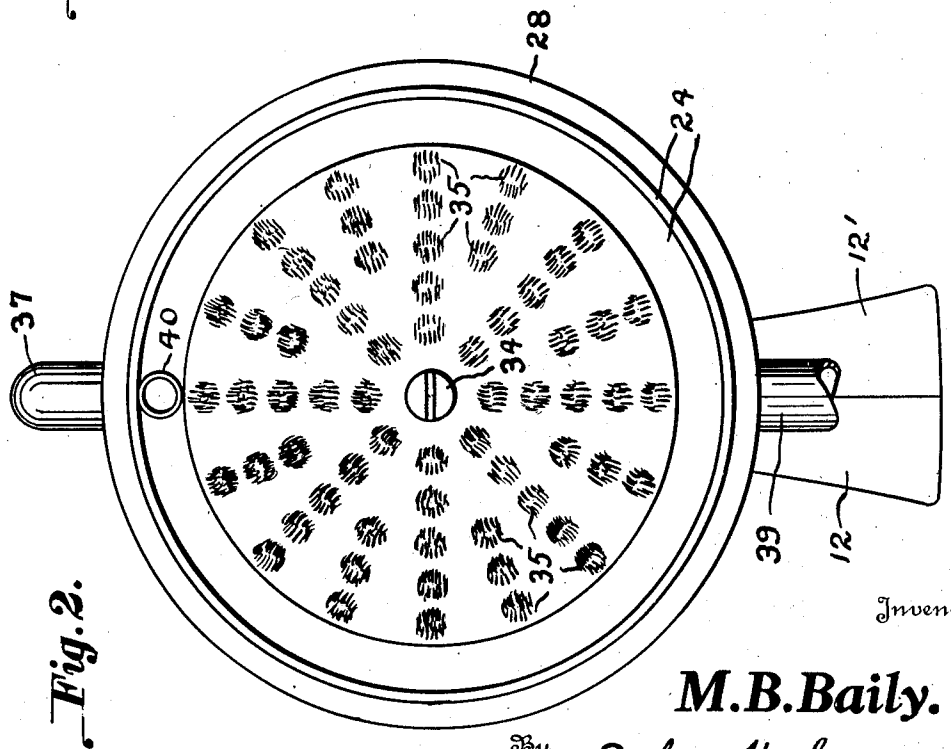

Fig. 2.

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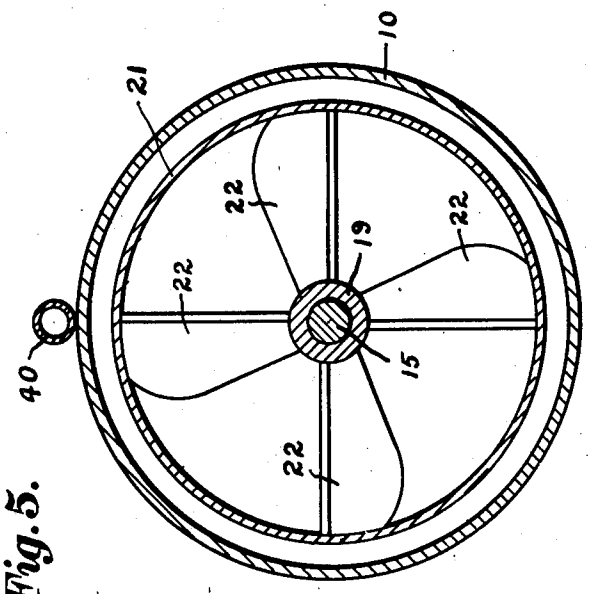

Fig. 5.

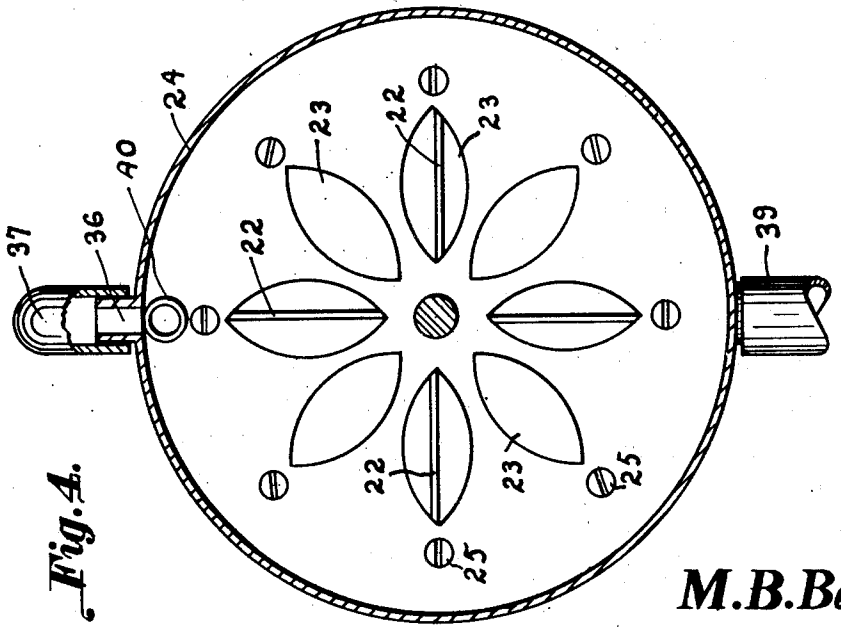

Fig. 4.

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Patented May 3, 1927. 1,627,263

UNITED STATES PATENT OFFICE.

MILNER B. BAILY, OF DUNLAP, IOWA.

SCRUBBING MACHINE.

Application filed October 2, 1925. Serial No. 59,998.

The present invention relates to improvements in scrubbing machines useful also for cleaning, polishing and abrasive purposes.

An object of the invention is to provide a machine in which the movable parts for accomplishing the scrubbing or other work are involved with a suction creating device and with gasket arrangement for coming in contact with the surface scrubbed for the purpose of assisting to hold the device upon the surface and removing to this extent the burden of supporting the implement from the operator.

Another object of the invention is to provide a machine of this character in which the suction producing device has the further function of acting to circulate water or other fluid to the working implement and to remove the dirt and other foreign matter therefrom.

A further object of the invention consists in providing for the regulation of the degree of the vacuum formed whereby the machine may be quickly moved over the surface to be treated with a minimum of labor on the part of the operator.

A still further object of the invention lies in providing a power driven machine, which will be light in weight and provided with an interchangeable brush or other polishing element.

A still further object of the invention is to provide a machine, the organization of which is compact and which involves the utmost simiplicity in its construction and method of operation, and which further is of a most durable nature.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a vertical section taken through a machine constructed according to the present invention.

Figure 2 is a front elevation thereof.

Figure 3 is a rear elevation of the same.

Figure 4 is a cross section taken on the line 4—4 in Figure 1, and

Figure 5 is a similar section taken on the line 5—5 also in Figure 1.

Referring more particularly to the drawings, 10 designates a cylindrical housing of suitable metal which is provided with a closed end wall 11. A "pistol grip" handle 12 is preferably formed integral with the end wall. The housing 10 is adapted to contain the field windings 13 and armature 14 of a motor. The motor is driven by a suitable source of electrical power (not shown) such as a battery or a conventional 110 volt lighting circuit. This circuit may be provided with a suitable switch for varying the speed or number of revolutions of the armature 14 of the motor, all under the control of the operator and used for the several different kinds of work to be performed by the tool.

The armature 14 is fixed to its shaft 15 by means of a pin 16. The shaft is journaled in bearings provided at one end by the wall 11 of the housing and by a disk 17 which is seated within the housing and secured thereto by means of an annular row of screws or keepers 18.

The shaft 15 provides a mounting for a suction fan's hub 19 which is affixed to it by means of a pin or keeper 20. The fan is preferably formed with an annular flange 21. The blades 22 of the fan are preferably integral with the flange 21 and hub 19; the flange 21 serving as a reinforcement. The pitch of the blades is such that, when rotated, air will be caused to move through the fan and towards the motor, but is prevented from striking the motor on account of the separating disk or wall 17, said disk 17 being solid and not provided with apertures, such as the apertures 23 formed in the brush or tool housing member 24.

The member 24 is cup shaped and secured to the housing 10 by means of an annular row of screws 25 as best shown in Figure 4. An annular lug or stop ring is formed upon the perimeter of the member 24 as indicated by the numeral 26. The function of this lug 26 is to prevent the rubber collar 27 from moving toward the motor. The rubber collar 27 is flexible and provided with an outturned flange 28 which is adapted to bear against the surface to be cleaned such as the surface indicated at 29.

The end of the revolvable shaft 15 is provided with a disk 30 having apertures 31 adapted to receive the pins 32 which are secured to the back of the brush or tool 33. The function of the pins 32 is to prevent rotary motion of the tool 33, except rotation with the shaft 15 and disk 30.

A set screw 34 is adapted to extend through the back 33 of the tool and be received by screw threads formed within the end of the shaft 15. By this means the tool is removably secured to the shaft 15 for doing work.

The tool may be provided with bristles 35 secured to the brush's back 33 in a conventional manner, or in lieu of a brush a polishing tool may be substituted, a sponge like tool, or other tool according to the work to be done as later explained.

At a convenient place upon the perimeter of the member 24, a hose-receiving projection 36 is placed which has communication with the interior of the member 24. The hose 37 is attached to the member 36, said hose being provided with a cut-off cock (not shown), the hose being in communication with a source of water supply. An exit port for the water and air is provided at the lower edge of the housing member 10 as indicated at 38, said exit port 38 being in communication with the fan chamber portion of the housing. To the exit port 38 may be attached a hose 39 the function of which is to lead the water and dirt away from the surface, or object which is being cleaned. With certain forms of work the hose 39 may be dispensed with and also the hose 37.

Attached to the member 24 is an air duct or pipe 40 having communication with the interior of the member 24. The function of this duct is to admit air into the member 24. The amount of air admitted is governed by the valve 41, which is normally closed, but may be opened for purposes later described by means of the lever 42. As shown in Figures 1 and 3, the valve is provided with a threaded stem 43 which projects through an aperture formed through the end of the lever 42, and is retained by means of the nut or keeper 44. The nut, it is obvious, provides an adjustment for the valve 41.

The lever 42 is pivotally mounted by means of the pin 45 to the ears 46, said ears preferably being formed integral with the wall 11 of the housing 10. The lower end of the lever 42 is adapted to register with the upper end of the trigger lever 47, at the point indicated by the numeral 48. The trigger lever 47 is adapted to have swinging movement about its pivotal mounting pin 49. This pin 49 is screw-threaded into the side wall of the handle 12. The lever 47 is normally drawn backward by means of the tension of the contracting spring 50 which is hooked to the lever 47 at one of its ends, its other end being secured to the pin 51. This pin 51 is also threaded into the side wall 12 of the handle.

The lower end of the lever 47 terminates in the finger hold 52 which is located within the trigger guard 53, said guard being a part of the handle 12. A set screw 54 is provided for preventing the lever 47 from moving too far backwards.

The handle 12 is preferably formed of two half portions, the portion 12 being attached to the wall 11 of the housing 10, and a cover portion 12′ which is similar in contour, being attached to the portion 12 by means of screws or keepers 55 which are best shown in Figure 3. The function of the cover portion 12′ is to prevent dirt, etc., from entering the handle and interfering with the mechanism and also to provide a smooth hand hold for the operator.

In operation, the operator grasps the device in one hand placing his finger on the trigger 52 and moves the end of the tool against the surface to be cleaned. The switch is closed causing the motor to revolve the brushes 35 and fan blades 22. The fan causes a backward motion of the air within the cup member 24, moving it through the port 38 and this operation causes a partial vacuum to be formed within the member 24, causing the rubber flange 28 to be sucked or forced against the surface 29. This suction or forcing, it will be noted, helps support the device against the work or surface 29. The result is that the operator is relieved from the tiresome task of holding the tool against the work. Now if the operator desires to move the tool to a different location or position, he may release the suction by pressing the trigger 52, thereby causing the valve 41 to open, allowing an inrush of air. The inrush of air being greater than the capacity of the fan to remove, the result will be that the rubber flange 28 will be permitted to loosen from the surface 29. Of course, the operator may partly open the valve 41 or do so at intermittent intervals, in a manner to partly hold the tool against the surface 29, and in this manner partly hold the tool against the work by means of the partial vacuum and partly by his hand. In this manner the tool may be moved over the surface 29 rapidly, which is desirable in certain class of work. Also by manipulation of the trigger release valve, the amount of pressure against the surface 29 may be governed in a manner to cause the brushes 35 to press hard or to press easy against the surface. When a hard pressure is used the flange 28 of the rubber member 27 will spread outwardly, on account of its flexibility, thereby allowing the fan to cause the brushes 35 to be pressed harder against the surface 29 for heavy scrubbing or polishing purposes.

If a sponge brush is substituted for a bristle brush for certain class of cleaning and it is desirable to use water, the operator may open the cock of the hose line 37, thereby allowing water to enter the mem-

ber 24. This water will be whirled about by the brush and scattered over the surface to be cleaned, the water, dirt, etc., passing through the apertures 23 of the member 24 and through the fan rearwardly, and out through the exit port 38.

Several different brushes may be employed for polishing brass, scrubbing windows, glass, floors and the like. However, the tool is particularly adapted for cleaning surfaces which are in a vertical or overhead-horizontal position on account of the ability of the tool to hold itself against the surface to be worked without strenuous exertion of the operator.

I do not wish to be restricted to the size, form and proportions of the various parts, and obviously changes could be made in the construction herein described without departing from the spirit of the invention, it being only necessary that such changes fall within the scope of the appended claims.

What is claimed is:—

1. A scrubbing machine comprising a casing having a brush comparment, a fan compartment communicating therewith and a motor compartment all disposed on substantially the same axis and said brush compartment being open at the side away from said fan compartment, a motor in said motor compartment, a motor shaft connected with the motor and extending through said fan and brush compartments, a brush mounted on said shaft in the brush compartment, a suction fan mounted on said shaft in the fan compartment, a flexible collar carried by said brush compartment and enveloping the brush, means for supplying liquid connected to said brush compartment, an outlet communicating with said fan compartment, an air inlet to the brush compartment, valve means for normally closing said air inlet, a handle for the casing extending substantially axially from the motor compartment end, and operating means carried by said handle for opening said valve means.

2. A scrubbing machine comprising a casing having a brush compartment at one end open at its free side, an intermediate fan compartment communicating with the brush compartment and a motor compartment at its other end cut off from the fan compartment, a motor in said motor compartment, a motor shaft connected to the motor and extending axially into the other compartments, a suction fan on said shaft in the fan compartment, a brush secured to said shaft in the brush compartment, a flexible collar enveloping the brush, means for supplying liquid connected to the brush compartment, an outlet communicating with the fan compartment, a normally closed air inlet to the brush compartment, and means for controlling the inlet of air to said brush compartment.

3. A scrubbing machine comprising a casing having brush, fan and motor compartments adjoining one another with the motor compartment cut off and the fan and brush compartments communicating, means for supplying liquid connected to the brush compartment, an outlet communicating with the fan compartment, a flexible collar extending about the brush compartment, an air inlet to the brush compartment, a valve for controlling said air inlet, a handle connected to the casing, a trigger mechanism carried by said handle and coupled to the valve, a motor in said motor compartment, a shaft driven by the motor and extending into said fan and brush compartments, a suction fan on the shaft in said fan compartment, and a brush secured to the shaft in the brush compartment.

In testimony whereof, I have affixed my signature.

MILNER B. BAILY.