

Nov. 19, 1929.

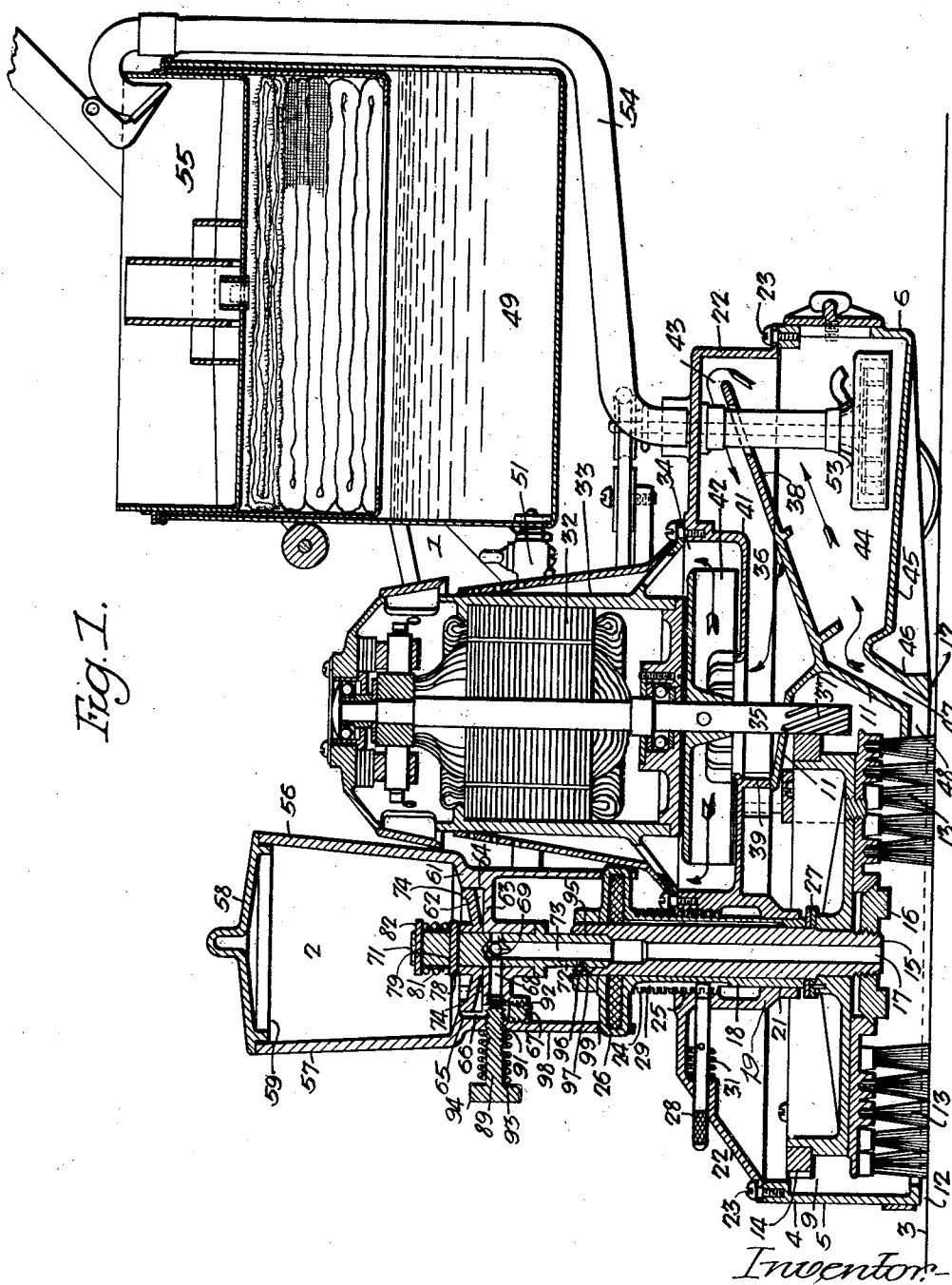
W. L. KEEFER

1,736,446

FLOOR WAXING AND POLISHING MACHINE

Filed April 7, 1925

3 Sheets-Sheet 1



Inventor:
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3 Sheets-Sheet 2

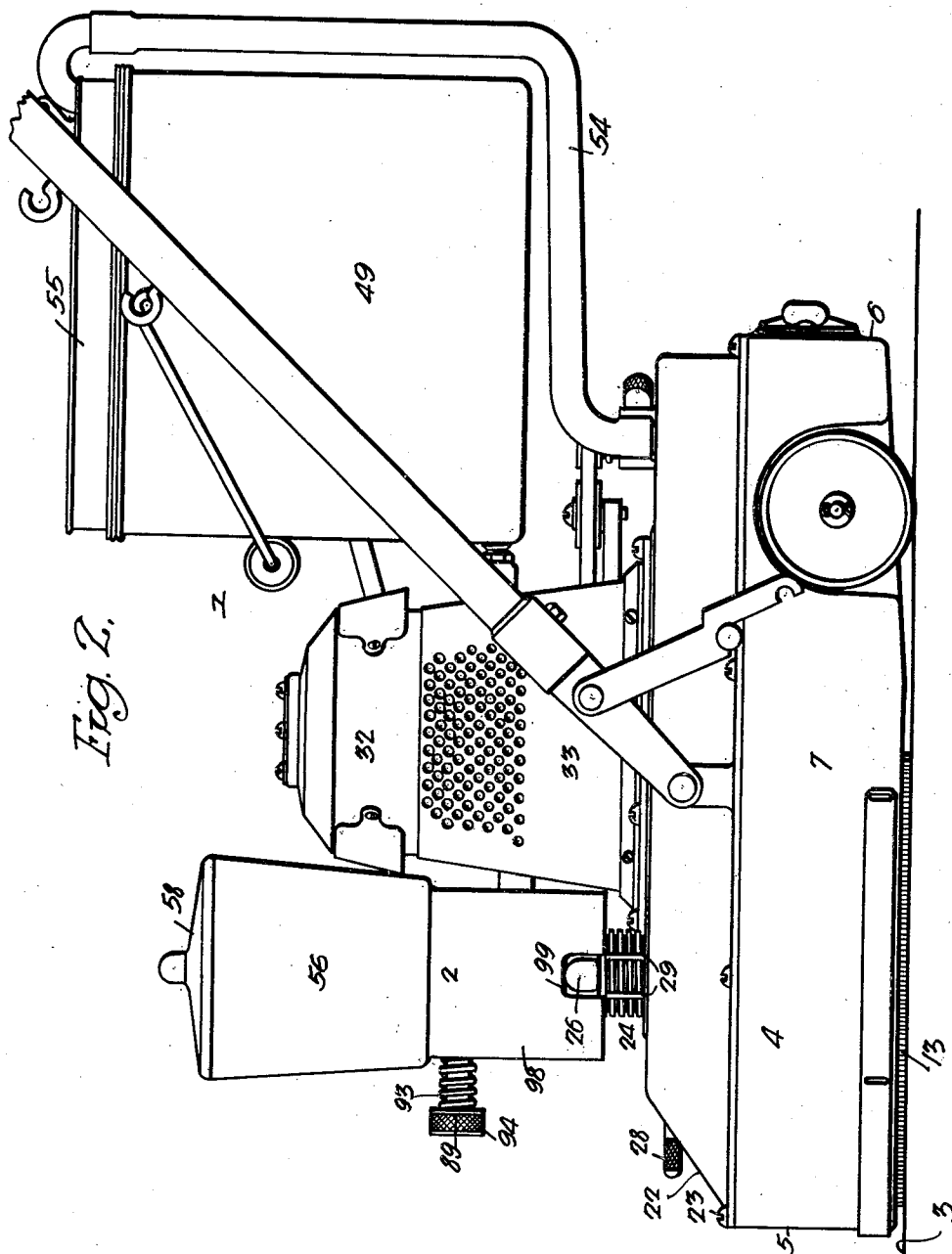


Fig. 2.

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3 Sheets-Sheet 3

Fig. 5.

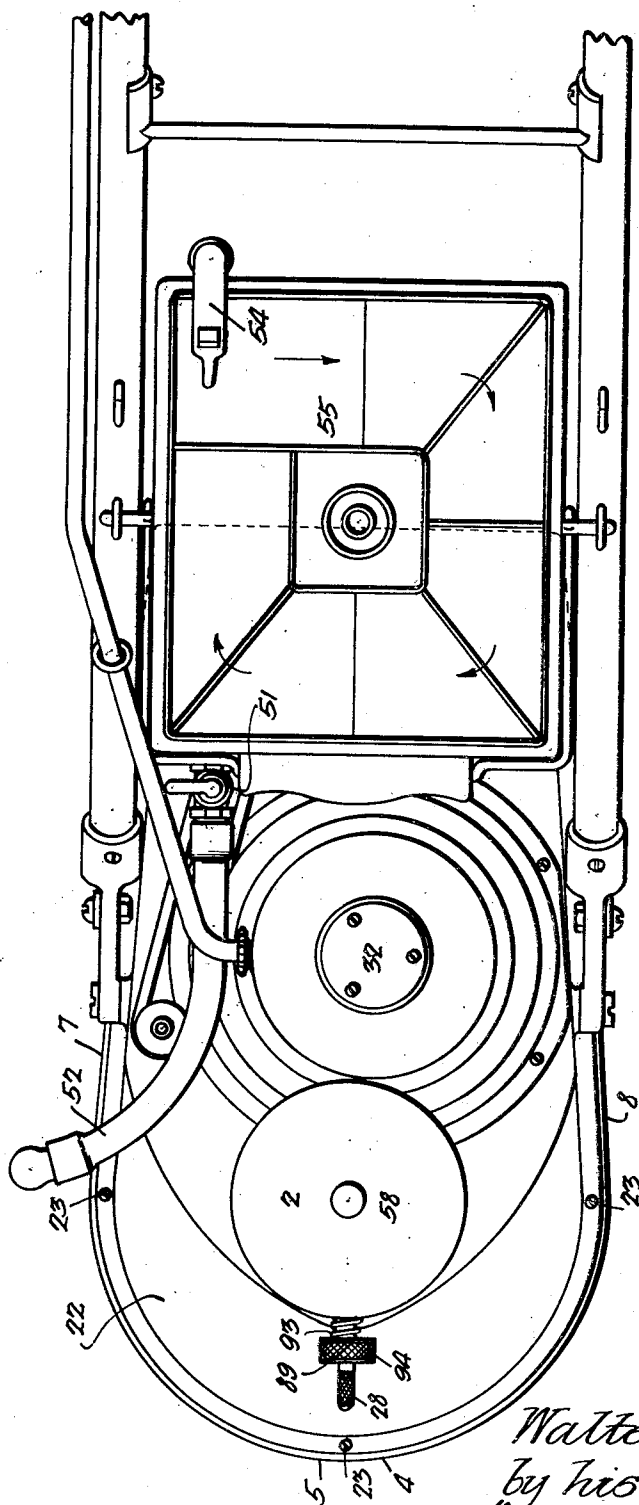


Fig. 5.

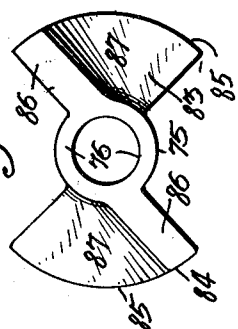


Fig. 6.

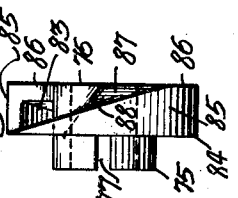
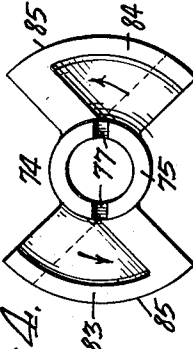


Fig. 4.



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UNITED STATES PATENT OFFICE

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FLOOR WAXING AND POLISHING MACHINE

Application filed April 7, 1925. Serial No. 21,395.

My invention relates to cleaning and polishing machines, and it has particular relation to such machines as are adapted to wax and polish floor surfaces.

5 One object of my invention is to provide a portable power-driven machine of the class described that shall be equally effective as a vacuum floor scrubbing machine and as a waxing and polishing machine.

10 Another object of my invention is to provide self-feeding means for the fluid supply cup of a waxing and polishing machine that shall minimize the tendency for the fluid to coagulate around the valve opening and stop the flow of fluid from said cup.

15 A further object of my invention is to provide a machine of the class described, wherein a flow of air may be established over the fluid applied to the floor surface so as to dry the same quickly.

20 Other objects and applications of my invention, as well as details of construction and operation, whereby my invention may be practiced will appear more fully hereinafter when taken in connection with the accompanying drawings, wherein,

Fig. 1 is a longitudinal sectional view of a combined vacuum floor scrubbing and waxing machine embodying my invention;

30 Fig. 2 is a side elevational view of the structure of Fig. 1;

Fig. 3 is a top plan view of the structure of the preceding figures; and

35 Figs. 4, 5 and 6 are enlarged, detail, top and bottom plan and side elevational views, respectively of the agitator for the wax cup.

In the illustrated embodiment of my invention shown in the drawings, a machine 1 of the general type disclosed in my co-pending application, Serial No. 681,164, filed Dec. 17, 1924, is operatively associated with a self-feeding wax cup attachment 2, whereby a floor surface 3 may be waxed and dried and polished with a minimum expenditure of time and of money.

45 The main machine 1 may comprise a base portion 4 which includes front, rear and side walls 5, 6, 7 and 8, respectively. A chamber 9 may be formed at one end of the base 4 by means of the front wall 5 adjacent portions

of the side walls 7 and 8 and a wall 11 which is spaced from the front wall 5 and extends between the side walls 7 and 8. The lower edges of the front, intermediate and side walls 5, 11, 7 and 8, respectively, are spaced from the floor surface 3 to provide an air gap 12 which extends around the chamber 9, permitting a flow of air through the same and over the portion of the floor surface 3 within the chamber 9, for reasons as will appear more fully hereinafter.

A brush 13 of annular form is mounted within the chamber 9 for rotative engagement with the floor surface 3 by means of a gear wheel 14, which is rigidly secured to a vertically positioned shaft 15, and a clamping plate 16, which is in threaded engagement with the lower end of the shaft 15, as shown in Fig. 1. Thus to remove the brush 13 from the supporting gear wheel 14, it is necessary only to unscrew the clamping member 16.

The shaft 15, which is provided with a central passage 17 terminating at its lower end in the chamber 9, may be revolubly mounted on a tubular bushing 18. The bushing 18 may loosely engage a bearing portion 19 of an inwardly projecting tubular extension 21 from the housing 22. The housing 22 may be secured by screws 23 to the upper edge of the front, rear and side walls 5, 6, 7 and 8, respectively.

In order to provide for the vertical adjustment of the brush 13, an upper portion 24 of the tubular sleeve 18 is threaded so as to engage a correspondingly threaded portion 25 of the tubular extension 21. The turning of the sleeve 18 may be facilitated by means of a knob 26 formed on the upper end thereof. The lower end of the sleeve 18 is spaced from the gear wheel 14 by means of a thrust bearing 27 of usual design.

When the sleeve 18 is turned, the brush 13 is correspondingly lowered to compensate for the wearing of the same. The tubular sleeve 18 may be secured in the desired position by means of a locking pin 28, which is slidably mounted in the housing 22 and movable into and out of engagement with a longitudinally extending slot 29 in the threaded portion 24

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of the sleeve 18. A spring 31 serves to cause the locking pin 28 to extend normally into the slot 29.

The brush 13 may be actuated by means of a motor 32 which is supported on a housing 33 secured to the edges of an opening 34 in the rear end portion of the housing 22. A shaft 35 of the motor 32 extends downwardly through the opening 34 and a chamber 36 into the vacuum chamber 9. A portion 37 of the shaft 34, which is disposed within the chamber 9, is spirally threaded and meshes with the gear wheel 14. The operation of the motor 32 thus causes the rotation of the brush 13. The chamber 36 may be formed by a vertically inclined extension 38 from the intermediate wall 11; a wall portion 39 of the housing 22, which is contiguous to the intermediate wall 11; and a portion 41 of the housing 22.

A fan 42 is positioned on the section of the shaft 35 within the chamber 36, whereby a flow of air may be established from the chamber 36 up around the motor 32 in the direction shown by the arrows. The chamber 36 is provided with an opening 43 into a sedimentation or expansion chamber 44. The latter may be formed by the intermediate wall 11, the side walls 7 and 8 and a base 45 which extends between said side walls rearwardly to the rear wall 6. The base 45 may be provided with a downwardly extending portion 46 which is spaced from the intermediate wall 11 to form a passage 47 between the vacuum chamber 9 and the sedimentation chamber 44. The edge of the projecting base portion 46 is spaced from the floor surface 3 and it co-operates with the adjacent edge of the intermediate wall 11 to form an arcuate nozzle 48. The direction of the flow of air in the above parts is indicated by arrows.

The sedimentation or expansion chamber 44 is particularly applicable when the machine above described is used for the scrubbing and washing of floor surfaces, and it then functions to cause a separation of the cleansing fluid and the air discharged from the vacuum chamber 9. The cleansing fluid may be supplied from a tank 49 through a valve 51 and connecting pipe 52 to the upper end of the tubular shaft 15. The effluent from the sedimentation chamber 44 may be removed by means of a centrifugal pump 53 actuated by means of the motor 32. The pump 53 discharges through piping 54 into a filtering apparatus 55 which constitutes one of the features of my aforesaid co-pending application. The drawings illustrate the valve 51 as closed and the pipe 52 disconnected from the shaft 15 to permit of the attachment of the wax cup structure 2.

Referring more particularly to Figs. 1, 4, 5 and 6, a cup or casing 56 for the reception of oil, wax or other polishing material com-

prises a side wall 57, a removable cover 58 for an upper end portion 59, and a base 61. The latter is provided with a recess 62 having a base 63 and a side wall 64. The latter wall 64 has an outlet 65 which opens into a downwardly extending perforation 66 in the base 61. The lower end of the perforation or passage 66 may be closed by means of a removable plug 67.

A horizontal passage 68 has one end in communication with the vertical passage 66, and its opposite end so disposed as to communicate successively with a plurality of radial passages 69 formed in a vertical shaft 71 which is journaled in the base 61 of the cup 56 and which extends up through the recess 62 into said cup 56. A lower portion 72 of the vertical shaft 71 is tubular in form providing a passage 73 which communicates with the radial perforations 69 at its upper end and with the vacuum chamber 9 at its lower end. A continuous passage is thus provided between the cup 56 and the chamber 9, and this passage may be periodically blocked upon the rotation of the vertical shaft 71.

As above-noted, an important feature of my invention is the provision of an agitator 74 that is adapted to exert a pumping action on the wax or other material within the cup 56, whereby said material may be drawn into engagement with the agitator 74. The latter is also adapted to establish a centrifugal force in the material in contact therewith, whereby the same may be positively actuated or fed through the opening 65 and passages 66, 68, 69 and 73 leading to the scrubber chamber 9. The agitator for accomplishing this desired result comprises a hub 75, a lower end 76 of which engages the base 63 of the recess 62. The upper end of the hub 75 is provided with a pair of aligned slots 77, 77 which are adapted to receive respectively the ends of a pin 78 removably positioned in a horizontally extending perforation 79 in the vertical shaft 71. The agitator 74 may be resiliently retained in position by means of a spring 81 which abuts against the upper edge of the hub 75 and a pin 82 removably secured to the upper end of the vertical shaft 71.

A pair of blades 83 and 84 extend in opposite directions from the hub 75, and each blade is provided with a curved outer wall 85 adapted to engage the side wall 64 of the recess 62. As particularly illustrated in Figs. 1 and 6, each blade further comprises a base portion 86, which engages the base 63 of the recess 62, and a differentially inclined surface 87 which extends to the upper edge of the curved side wall 85 so as to provide an inclined edge 88, whereby the rotation of the blades 83 and 84 in the direction indicated by the arrows in Fig. 4 may cause the wax or like material to be drawn down into the

recess 62 and thereafter thrown by centrifugal force against the side wall 64.

The quantity of the wax thus positively fed through the outlet opening 65 into the passages 66, 68, 69 and 73 may be controlled at will by means of a regulating screw 89. The screw 89 is mounted in a threaded perforation 91 in the base portion 61 of the wax cup 56 and it extends into the vertical passage 66, so as to interrupt when desired the communication between the latter passage and the horizontal passage 68, as shown in Fig. 1. The end of the passage 68 adjacent to the vertical passage 66 is preferably provided with threads 92, whereby the inner end of the regulating screw may enter the horizontal passage 68. A spring 93 encircles the outer portion of the regulating screw 89 between the base 61 of the wax cup 56 and an enlarged head portion 94 of the regulating screw 89, serving to retain the latter in the desired position.

The tubular shaft portion 72 is of such dimensions as to fit within an enlarged portion 95 of the brush shaft 15 immediately adjacent to the upper end thereof. The telescoping shaft portions may be keyed together by means of a pin 96 which extends from the agitator shaft 71 into a vertical recess 97 in the adjacent portion of the brush shaft 15. The wax cup 56 may be supported in this position by means of a tubular housing 98 which extends downwardly from base portion 61. The lower edge of the housing 98 is provided with pairs of aligned slots 99, 99 which are adapted to receive the arms of the brush-adjusting knob 26. A removable mounting is thus afforded the wax cup attachment 2, making possible a quick change in the application of the machine, that is, from a waxing and polishing device to a floor scrubbing and cleaning device.

In operation, when the motor 32 is energized, the fan 42, the agitator 74 and the polishing brush 13 are simultaneously operated. As a result of the operation of the agitator 74, wax is positively fed from the cup 56 through the outlet opening 65 and the passages 66, 68, 69 and 73 into the vacuum waxing chamber 9, where it is immediately spread over the floor surface within the chamber 9 by the action of the rotating brush 13.

The fan 42 simultaneously causes a flow of air into the chamber 9 through the air gap 12, causing the wax to dry quickly, with the result that said floor surface begins to polish at once. The advantages of this method of waxing and polishing floor surfaces over the prior art methods are readily apparent, inasmuch as in the latter the wax must not be polished for a relatively long period after being applied to the floor surface in order to permit said wax to dry and harden.

While I have shown only one embodiment

of my invention, for the purpose of describing its principles of construction and operation, it is apparent that various changes and modifications may be made therein without departing from the spirit of my invention, and I desire, therefore, that only such limitations shall be imposed thereon as are indicated in the appended claims or as are demanded by the prior art.

I claim:

1. A chamber provided with an outlet opening for a desired material, and an agitator positioned within said chamber and provided with a projecting tubular shaft portion having an inlet opening, said outlet and inlet openings being interconnected, said agitator being adapted to force said material from said chamber through said outlet opening into said inlet opening.

2. A chamber provided with an outlet opening for a desired material, an agitator positioned within said chamber and provided with a projecting tubular shaft portion having an inlet opening, said outlet and inlet openings being interconnected, said agitator being adapted to force said material from said chamber through said outlet opening into said inlet opening, and means for regulating the amount of material discharged from said outlet opening.

3. A casing having a recess in one portion thereof, one wall of said recess being provided with an outlet opening, a shaft extending through the base of said recess, and a member having a plurality of blades removably secured to said shaft, the blades being adapted to engage the wall of said recess and so formed as to force positively the material from said casing through said outlet opening, one portion of said shaft being tubular in form and provided with an inlet opening in communication with said outlet opening.

4. A casing having an outlet opening in one wall for the passage therethrough of the desired material, a shaft projecting into said casing, a member mounted on said shaft and adapted to engage the walls of said casing, and resilient means tending to prevent a vertical movement of said member, the latter being so formed as to cause a positive actuation of the material from said casing through said outlet opening.

5. A casing having an outlet opening in one wall for the passage therethrough of the desired material, a shaft projecting into said casing, a member mounted on said shaft, and resilient means tending to prevent a vertical movement of said member, the latter being so formed as to cause the positive actuation of the material from said casing through said outlet opening, the end portion of said shaft being tubular and having an inlet opening in communication with said outlet opening.

6. A casing having an outlet opening in

- one wall for the passage therethrough of a desired material, a shaft projecting into said casing, a member mounted on said shaft and adapted to engage the walls of said casing, resilient means tending to prevent a vertical movement of said member, the latter being formed so as to cause the positive actuation of said material from said casing through said outlet opening, one end portion of said shaft being tubular and having an inlet opening communicating with said outlet opening, and means for regulating at will the amount of material discharged through said outlet opening.
7. A casing having a recess in the base portion thereof, the wall of which is provided with an outlet opening, a shaft extending up through said base portion, a member removably mounted on said shaft provided with a plurality of blades extending to the wall of said recess, resilient means tending to prevent a relative movement between said shaft and said member, said shaft being tubular in form and provided with an inlet opening communicating with said outlet opening, and means for regulating at will the amount of material discharged from said outlet opening.
8. A machine comprising a vacuum chamber movable over a surface to be treated, a chamber adapted to contain a desired material and having an outlet opening, and an agitator positioned within said last-mentioned chamber provided with a tubular shaft portion opening into said first-mentioned chamber, said shaft portion having an inlet opening in communication with said outlet opening, said agitator being adapted to force said material through said openings and the passage of said shaft into said first-mentioned chamber.
9. In a floor-polishing machine, means for scrubbing and polishing the floor, means for retaining a polishing medium, means interconnecting the said two first mentioned means, and means for pumping the polishing medium towards said last-mentioned means and for then forcing it through said interconnecting means into proximity with the polishing means.
10. In a floor-polishing machine, means for scrubbing and polishing the floor, means for retaining a polishing medium, means interconnecting the said two first-mentioned means, and means in said retaining means for pumping the polishing medium towards said last mentioned means and for then forcing it through said interconnecting means into proximity with the polishing means.
11. In a floor-polishing machine, a rotatable polishing brush, means for rotating said brush, a container for a polishing medium, a hollow shaft interconnecting said brush and said container, and a centrifugal fan in said container for drawing the polishing medium thereto and for then forcing it through said shaft into operative relation with said brush.
12. In a floor-polishing machine, a polishing means for the floor, having an opening therein, means for rotating said polishing means, a container above said polishing means and having an opening therein, a hollow shaft interconnecting said openings, and a centrifugal pump in said container for drawing the polishing medium thereto and for then forcing it through the opening in said container, into said shaft, and thence into proximity with the polishing means.
13. In a floor-polishing machine, a polishing means for the floor, having an opening therein located substantially centrally thereof, means for rotating said polishing means, a container for a polishing medium having an opening adjacent the bottom thereof, a hollow shaft interconnecting said openings, means in said shaft for controlling the size of opening therein, and centrifugal means in said container adjacent the bottom thereof for drawing the polishing medium downwardly in the direction thereof and for then forcing it through said hollow shaft into proximity with said polishing means.
- WALTER L. KEEFER.

CERTIFICATE OF CORRECTION.**Patent No. 1,736,446.****Granted November 19, 1929, to****WALTER L. KEEFER.**

It is hereby certified that the name of the assignee in the above numbered patent should have been written and printed "Harry G. Wolf", instead of "Walter G. Wolf", as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 20th day of May, A. D. 1930.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

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