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VACUUM WASHER AND CLEANER

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Fig. 1.

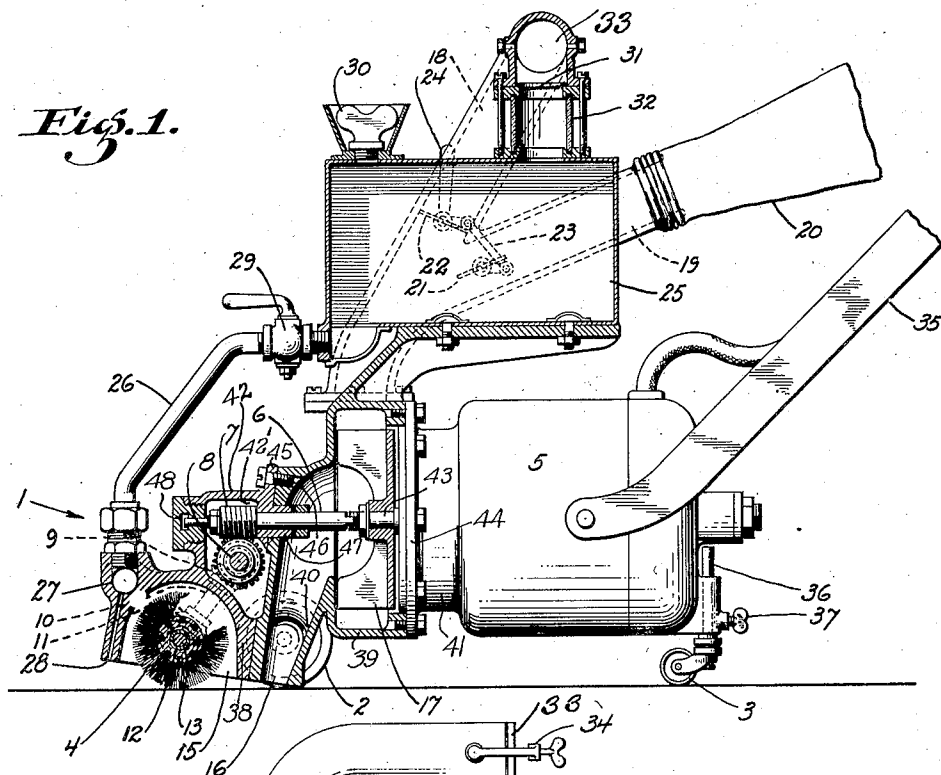
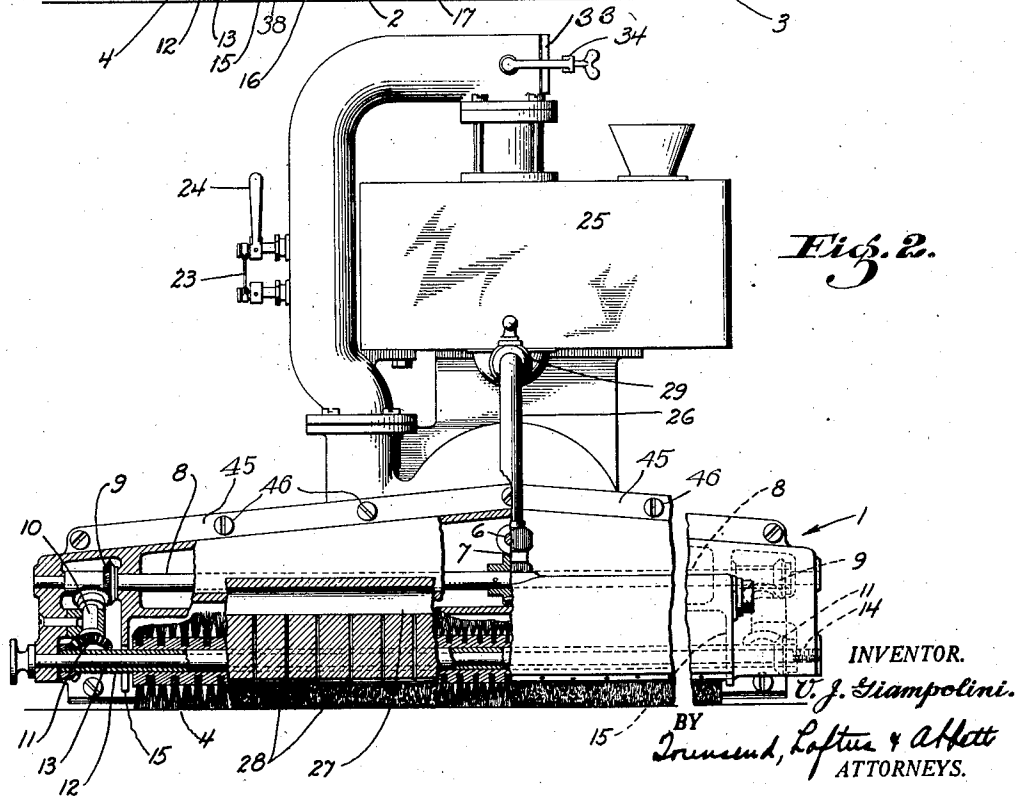


Fig. 2.



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VACUUM WASHER AND CLEANER.

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This invention relates to an improved floor washer and cleaner and more particularly to a combined vacuum washer and cleaner. Vacuum cleaners of various kinds have been devised which are very efficient in sucking up dust and loose particles, but which are not adapted to clean a floor or like surface, where the dirt is not in a loose condition. It is one object of my invention to provide a floor cleaner or washer which is adapted to scrub the floor with a soap solution in a manner loosening the dirt therefrom, and thereafter sucking the solution and the dirt contained therein upwardly into a container on the machine. The construction is preferably such that the soap solution is used continuously, the same being strained after its application to the floor to remove the dirt therefrom.

Another object of the invention is to provide a combined vacuum washer and cleaner which can be used either as an ordinary vacuum cleaner to merely remove loose dust and dirt particles by suction, or as a floor washer in the manner above defined.

In the accompanying drawing I have illustrated one specific embodiment of my invention, but it will be understood that the invention can be otherwise embodied and that the drawing is not to be construed as defining or limiting the scope of the invention, the claims appended to the specification being relied upon for that purpose.

Referring to the figures of the drawing:

Figure 1 is a side elevation of my machine, the same being illustrated partially in section.

Figure 2 is a front view thereof, partially in section.

My improved washer and cleaner comprises a carriage 1 supported on rollers 2 and casters 3. The front portion of the carriage is formed by a downwardly opening brush housing 38 which is relatively wide and within which is mounted the rotary brush 4. Rearward of the housing 38 there is formed as a separate element a fan housing 39 having a downwardly and forwardly extending nozzle 40 terminating in a port 16. Attached to the fan housing and disposed rearward thereof is the motor casing 41 having therein the motor 5.

The brush 4 is driven from an electric motor 5 through a shaft 6, worm and worm wheel 7, shaft 8, bevel gears 9, shaft 10, and bevel gears 11. The brush includes a tubular shaft 12 and is supported in place by a

rod 13 extending through this shaft and threaded into the end walls of the brush housing 38 at 14. Slotted walls 15 are provided at the ends of the brush for keeping dust and dirt from reaching the bevel gears 11.

The suction port 16 of the nozzle 40 is disposed closely adjacent the floor directly behind the brush. A vacuum is created therein by a fan 17 on the motor shaft 6 in the usual manner. The upper end of the port branches into two ports 18 and 19, the port 18 being hereinafter described. The port 19 leads into the usual dust bag 20. Butterfly valves 21 and 22 are mounted in the ports 18 and 19 and preferably are connected together by a link 23 and operated by a handle 24. In the position of the handle illustrated in Fig. 1, the port 18 is closed and the port 19 open. By moving the handle, the port 18 may be opened and the port 19 simultaneously closed.

A tank 25 for water or a washing soap solution is mounted on the carriage. A pipe 26 connects this tank with a port 27, extending along the front of the carriage and having a plurality of small ports 28 distributed along and directly ahead of the brush. The flow of washing liquid from the tank is regulated by a valve 29. The tank can be filled through an opening ordinarily closed by a threaded stopper 30.

The branch port 18 leads into the upper portion of the tank 25 preferably through a strainer 31 and a sight glass 32. An airtight gate 33 is provided adjacent the screen 31 and held in place by a screw latch 34. By releasing the latch, the gate can be opened and the screen easily cleaned.

It is to be particularly noted that the carriage 1 is formed by three separate castings or sections which constitute respectively the motor casing, the fan casing having a downward prolongation forming the nozzle 40, and the housing 38 which encloses the rotary brush 4. This casting or section 38 is formed to provide a chamber 42' which encloses the shaft 8 and the transmission gear whereby the motion of the motor is transmitted to the shaft 8 and from the shaft 8 to the rotary brush. The motor shaft 43 extends through a plate 44 which forms the rear end of the fan housing 39. The fan 17 is mounted upon the motor shaft 43, as shown in Figure 1, and the extremity of this shaft 43 within the fan housing is transversely notched.

Disposed against the front wall of the casting which forms the fan housing and nozzle

40 is the casting 42. This part 42 which is cast with the housing 38 is practically co-extensive with the front of the suction nozzle 40 and the fan casing and is formed with a flange 45 through which screws 46 pass into the front wall of the fan housing 39. The rear wall of the casting or section 42 is formed with a bearing 47 for the shaft 6 and immediately opposite this bearing the front wall of the section 42 has a screw-threaded opening in which is disposed a plug 48 which constitutes a bearing for the forward end of the shaft 6. The rear end of the shaft 6 is provided with a lug fitting within the notch formed in the adjacent extremity of the shaft 43 so that by removing the plug 48 the shaft 6 may be removed entirely, and further by removing these screws 46 the front section 42 with the housing 38 may be entirely removed with the shaft 6 so that any of the parts carried by this front section may be repaired, replaced, cleaned or otherwise acted upon without in any manner disturbing the fan, the motor or the parts rearward of the housing 39. By removing the screws holding the plate 44 in place, the fan may be removed or the motor removed, thus permitting cleaning or repair of the fan or the motor.

It is to be noted that by adjusting the post 36 of the caster wheel 3, the machine may be tilted forward upon the wheels 2 as upon a fulcrum so as to cause the brush 4 to bear with greater or less force upon the floor to be cleaned, depending entirely upon the work to be done. This tilting forward of the machine is permitted by the fact that the under face of the brush housing 38 is inclined upwardly and forwardly.

Briefly, the operation of my improved machine is as follows.

First, the machine can be used as an ordinary vacuum cleaner. When so used, the valve 18 to the tank is closed and the valve 19 to the dust bag 20 opened to the positions shown in Fig. 1. Also, the tank 25 is either empty or the valve 29 therefrom closed.

Second, the machine can be used as a floor washer as follows. A water or a soap washing solution is poured into the tank 25. The valve 18 is opened and the valve 19 closed. The valve 29 is opened sufficiently to provide the desired amount of water on the floor ahead of the brush 4. As the machine is pushed forwardly, the brush rotates in a clockwise direction. The scrubbing water along with the loosened dirt is thereafter sucked upwardly through the ports 16 and 18 and drained downwardly into the tank through the screen 31. The screen thereby removes the dirt from the water which is used continuously in the scrubbing operation. The floor may be gone over as many times as necessary and each time the water is automatically delivered to the floor ahead of the brush and sucked upwardly therefrom be-

hind the brush after the scrubbing operation.

It will of course be understood that brushes varying in texture should be used for different kinds of work. These different brushes can be readily interchanged in the machine, merely by removing the rod 12. An operating handle 35 is provided at the rear of the machine. The pressure of the brush on the floor can be regulated by adjusting the machine vertically on the castor post 36 and securing the same by set screw 37. In such adjustment the machine is pivoted about the rollers 3.

Having thus described my invention, what I claim is:

1. A floor cleaner including a carriage, a transversely extending brush housing forming part of the carriage and disposed at the forward end thereof and opening downward, a shaft extending through the housing and carrying a rotary brush, a water tank mounted upon the carriage, means for delivering the water from the tank to a position immediately in advance of the brush, a fan housing disposed below the tank and rearward of the brush housing, a transversely extending vacuum nozzle connected to the fan housing and extending downward into position immediately behind the brush housing and having a transversely elongated port, a tubular connection leading upward from the fan housing and discharging into the water tank and having a strainer therein, a portion of the pipe connection being movable to permit access to be had to the strainer, a fan in the fan housing, and a motor operatively connected to the fan and to the brush to drive the same.

2. A cleaner of the character described including a carriage, a transversely extending brush housing mounted thereon and opening downward, a rotary brush mounted therein and rotating in a vertical plane, a fan housing having a vacuum head opening downward immediately rearward of the brush housing and extending transversely parallel to the brush housing and continuous therewith, a motor on the carriage operatively connected to the fan and to the rotary brush to drive the same, a tank mounted upon the carriage, means for discharging water from the tank in advance of the brush housing and at intervals along the entire length thereof, said means including a valved discharge pipe, a pipe connection leading from the fan housing and discharging into the tank, and valve means controlling passage through said pipe.

3. A floor cleaner comprising a carriage including a fan housing, an electric motor attached to the rear face of the fan housing and extending rearward therefrom, the forward end of the motor having a portion forming the rear wall of the fan housing, the forward wall of the fan housing extending

downward and being formed to provide a transversely extending downward opening vacuum head, a fan in the fan housing mounted upon the motor shaft, a housing mounted upon the front wall of the fan housing and formed to provide a transversely extending brush chamber upon its under side, the front wall of the brush chamber being formed to provide a transversely extending water distributing chamber having ports extending downward through the front wall of the brush housing, a rotary brush in the brush chamber, a transversely extending shaft in the said housing above the brush chamber, said shaft being operatively engaged at its opposite ends with the rotary brush, a driving shaft mounted in said housing at right angles to the first named shaft and geared therewith, said shaft having detachable engagement with the motor shaft in the fan housing.

4. A floor cleaner of the character described including a carriage formed of a motor casing, a fan housing having a vacuum head, a motor shaft extending out of the motor casing through the fan housing and into the brush housing, the shaft being made in detachable sections and a brush housing, the fan housing and vacuum head being disposed between the brush housing and the motor casing and the three elements being detachably engaged with each other, a wheeled support for the rear end of the motor casing, a wheeled support mounted upon the fan casing and the vacuum head, and a rotary brush mounted within the brush housing, the rotary brush being operatively connected to said shaft to be driven thereby, the under face of the brush housing being upwardly and forwardly inclined whereby to permit the carriage to be rocked upon the adjacent wheeled support to carry the brush into greater or less contact with the floor, the rear wheeled support being vertically adjustable.

5. A floor cleaning mechanism including a wheeled support, a transversely extending brush housing mounted thereon and opening downwardly, a rotary brush extending longitudinally through the housing and rotating about a horizontal axis, the housing in advance of the brush being formed to provide a transversely extending water-containing chamber having a plurality of ports discharg-

ing downward and opening through the lower edge of the front wall of the brush housing in advance of the brush, a water tank having a pipe connection to the water chamber and provided with a valve, a fan casing disposed behind the brush housing and having a vacuum nozzle connected with the interior of the fan chamber and extending transversely of the longitudinal axis of the machine and opening downward immediately behind the brush, a suction fan disposed in the housing, a motor mounted upon the wheeled support and driving the suction fan, and a tubular connection leading from the suction fan housing to the water tank.

6. A floor cleaner comprising a motor casing, a fan housing detachably mounted upon the front of the motor casing and having a downwardly and forwardly extending vacuum nozzle, a fan disposed within the fan housing, a motor shaft extending from the motor casing through the rear of the fan housing and engaged with this fan, a shaft supported in the forward wall of the fan housing and detachably engaged with the motor shaft, a section detachably mounted upon the front wall of the fan housing and nozzle and formed to provide a downwardly opening brush chamber extending transversely of the machine, a gear chamber disposed above the brush chamber, the rear of said section being formed to provide a bearing through which said last named shaft extends into the gear chamber, the front wall of the gear chamber having a removable portion whereby access may be had to the interior of the gear chamber, a rotary brush mounted within the brush housing, and gearing operatively connecting the brush to said last named shaft and disposed within said gearing chamber.

7. In a vacuum cleaner, a rotatable exhaust fan, a casing there for having an inlet and an outlet, a vacuum head connected to the inlet of the casing, a pipe connection leading from the outlet of the fan casing and formed to provide two divergent branches, a tank into which one of said branches discharges, a collecting receptacle into which the other of said branches discharges, and valve means for closing off either of said branches and simultaneously opening the other branch.

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