

July 8, 1969

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3,454,042

PORTABLE CAR WASH MACHINE

Filed Aug. 12, 1966

Sheet 1 of 2

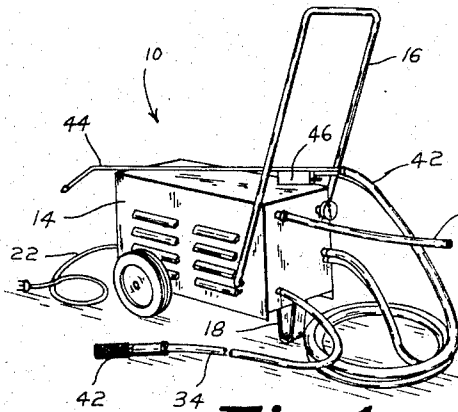


Fig. 1

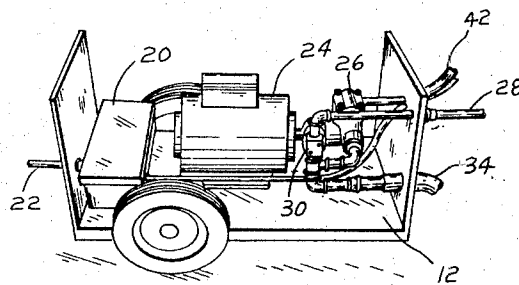


Fig. 2

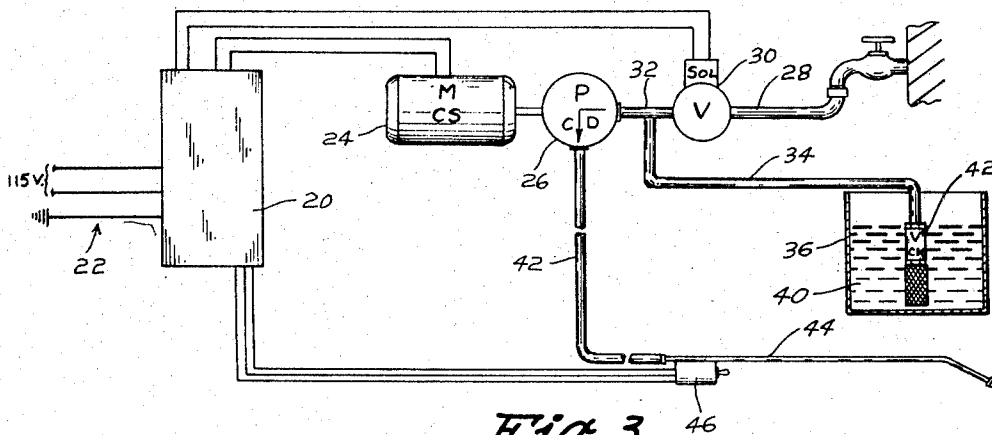


Fig. 3

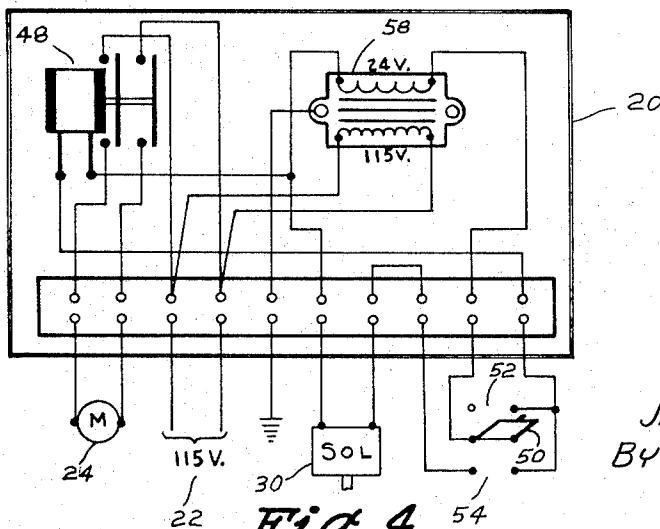


Fig. 4

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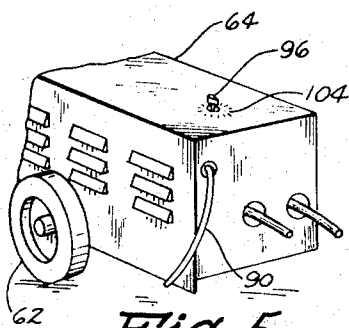


Fig. 5

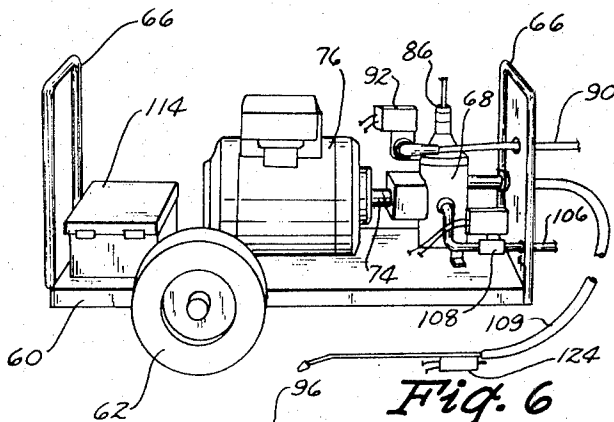


Fig. 6

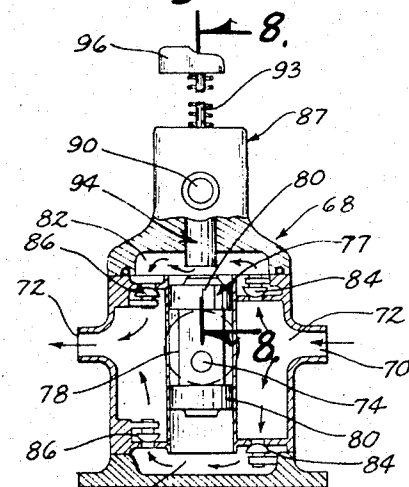


Fig. 7

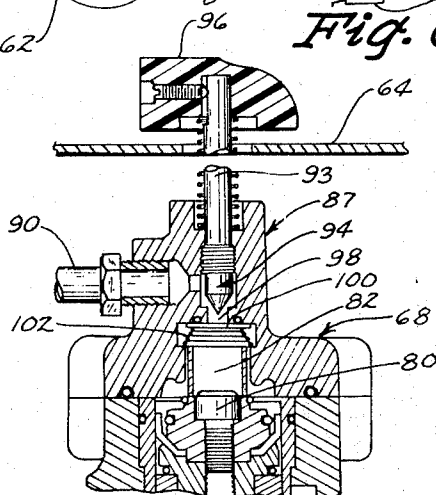


Fig. 8

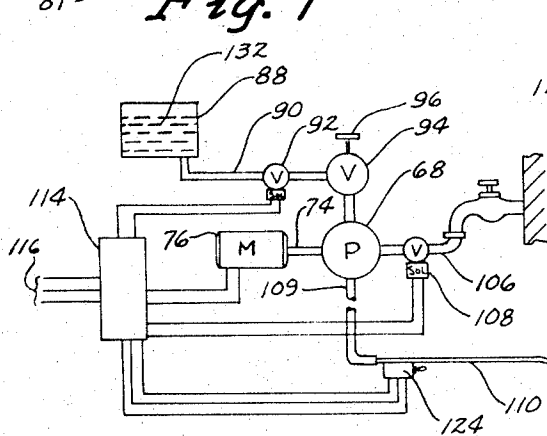


Fig. 9

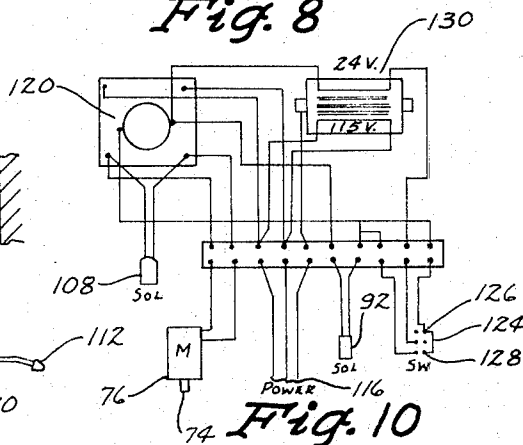


Fig. 10

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PORTABLE CAR WASH MACHINE

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Continuation-in-part of application Ser. No. 335,200,
Jan. 2, 1964. This application Aug. 12, 1966, Ser.
No. 575,485

Int. Cl. E03b 7/07; B08b 3/00

U.S. Cl. 137—565

5 Claims

ABSTRACT OF THE DISCLOSURE

A cleaning machine for separately dispensing a cleaning solution of water including a pump having a pair of pistons movable between a pair of oppositely disposed piston head assemblies, one of said heads being in direct communication with a cleaning solution whereby the cleaning solution is dispensed from the pump.

This application is a continuation-in-part of my copending application, Ser. No. 335,200 entitled Portable Car Wash Machine, filed Jan. 2, 1964, and now abandoned.

It is one of the objects of this invention to provide a machine for washing vehicles or the like which is mainly self-contained and may be readily moved to the vicinity of the vehicle or the like being washed.

It is another object of this invention to provide a machine for washing vehicles or the like which includes a pump having a double acting piston with piston head assemblies in communication with inlet and outlet openings, and a cleaning solution conduit being connected directly to one of the piston head assemblies for mixing with water being supplied to the inlet of the pump.

A still further object of this invention is to provide a machine for washing vehicles or the like having a double acting piston pump with a pair of piston head assemblies and a cleaning solution conduit being connected directly to one of the piston head assemblies and a selectively manually adjustable valve being provided in the cleaning solution conduit.

Yet another object of this invention is to provide a cleaning machine having a frame mounted on support wheels with a housing mounted thereon enclosing a motor and pump assembly, said pump assembly including a double acting piston having oppositely positioned head assemblies, one of said head assemblies being connected directly to a cleaning solution conduit having an adjustable valve operable from the outside of said housing.

Another object of this invention is to provide a washing machine capable of dispensing two separate liquid solutions wherein dispensing of one of the solutions will automatically prevent discharge of the other solution from the machine.

A further object of this invention is to provide washing machine apparatus having electrical controls which are conveniently mounted on the discharge conduit.

Another object of this invention is to provide a washing machine having controls on the discharge conduit which permit turning the electrical power supply to the machine on and off, pumping only a liquid wash solution through

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the discharge conduit or pumping only a clear water solution from the machine.

A further object of this invention is to provide a washing machine which is simple in design, economical to manufacture and refined in appearance.

This invention consists in the construction, arrangements, and combination, of the various parts of the device, whereby the objects contemplated are attained as herein-after more fully set forth, specifically pointed out in the claims, and illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of the washing apparatus of this invention;

FIG. 2 is a top side perspective view of the machine in FIG. 1 but with the cover removed;

FIG. 3 is a schematic showing generally the electrical and mechanical component parts of the washing machine and their relationship to each other;

FIG. 4 is a detailed electrical schematic only for this machine;

FIG. 5 is a perspective view of an alternate embodiment of this invention;

FIG. 6 is a side perspective view of the portable cleaning machine of FIG. 5 but without the housing enclosing the frame and cleaning system components;

FIG. 7 is a fragmentary cross-sectional elevational view of the pump assembly employed in the cleaning machine of FIG. 5;

FIG. 8 is a cross-sectional view taken along line 8—8 in FIG. 7;

FIG. 9 is a schematic drawing of the electrical and fluid circuitry for the cleaning machine of FIG. 5; and

FIG. 10 is an electrical schematic of the electrical circuitry for the cleaning machine of FIG. 5.

In FIG. 1 of the drawings the washing machine apparatus of this invention is referred to generally by the reference numeral 10. As shown in FIGS. 1 and 2, the component parts are carried on a two-wheel vehicle 12, which is provided with a cover 14 and a handle member 16. At the end of the vehicle 12, opposite the two wheels, a support stand 18 is provided.

Carried on the vehicle 12 under the cover 14, as shown more clearly in FIG. 2, is an electrical control box 20 connected by an electrical cable 22 to a power source not shown. The electrical power is connected to a motor 24 which in turn drives a pump 26. A water source external to the vehicle 12 and not shown is connected by a conduit or hose 28 which has a solenoid normally closed valve 30 disposed therein. This valve 30 is also operated from the control box 20. A conduit 32 extends from the solenoid valve 30 to the pump 26 and intermediate its ends is connected by a conduit 34 which extends to a container 36 filled with a soap solution 40. A one-way check valve 42 is provided on the end of the conduit 34 in the container 36 to permit fluid to flow only towards the pump 26 such that when the solenoid valve 30 is opened water will not fill the container 36. A discharge conduit 42 is then provided on the opposite side of the pump 26 and has a nozzle 44 which is manually operated. Conveniently located on the nozzle 44 is an electrical switch assembly 46 connected to the control box 20 for operation of the motor 24 and the solenoid valve 30.

Referring to FIG. 3 the details of the electrical wiring

and operation of the washing machine are shown. The electrical power supply 22 is connected to one side of the relay 48 which may be closed by moving the switch 50 to either the position 52 or the position 54. When the switch 50 is moved to the position 52, a circuit from the electrical source 22 is closed through the motor 26 and the relay 48 only. However, when the switch is moved to the position 54, not only is the motor circuit closed, but also a circuit which includes a step-down transformer 58 and the solenoid water valve 30. Thus it is seen that the solenoid valve is operated from a 24 volt supply as opposed to the conventional line voltage of 115 volts. Also it is seen that in either of the positions 52 or 54 the motor 24 and the pump 26 are continuously operated; however, in one position (position 52) the pump 26 draws soap solution 40 from the container 36 for discharge through the nozzle 44 and when the switch 50 is moved to the other position (position 54) the valve 30 is opened to permit water to enter the pump 26 at such a pressure that the conduit 34 is filled with water thereby closing it off and thereby providing only a water solution to the discharge nozzle 44. It is to be understood that the pressure in the conduit 32 when the solenoid valve 30 is opened, causes only the water to move to the pump 26 since the soap solution 40 is dependent upon the pump 26 to be transferred from the container 36 to the discharge conduit 42. Additionally, it is seen that the check valve 42 at the end of the conduit 34 in the container 36 prevents water from entering the container 36 although the conduit 34 may be filled with a clear water solution.

In FIGS. 5-10 an alternate embodiment of this invention is illustrated and includes a frame 60 having ground supporting wheels 62 and an enclosing housing 64. A pair of U-shaped upright frame members 66 are positioned at opposite ends of the frame 60 for supporting engagement with the housing 64.

A pump assembly 68 is mounted on the frame 60 and is provided with an inlet opening 70 and an outlet opening 72. A drive shaft 74 extends from the pump assembly 68 and is connected to an electrical motor 76 mounted on the frame 60. A double acting piston 77 is provided in the pump assembly 68 and is operated by the drive shaft 74 eccentrically mounted on a cam 78. The double acting piston assembly 77 includes a pair of identical piston heads 80 which are movable towards and away from adjacent piston head assembly chambers 81 and 82 which are in communication with one way inlet and outlet valves 84 and 86 respectively. The valves 84 and 86 permit the flow of water or the like through the inlet opening 70 to each of the piston head chambers 81 and 82 and then out through the outlet opening 72.

A cleaning solution injector 87 is mounted on top of the pump assembly 68. A cleaning chemical solution container 88 is connected by a conduit 90 through a solenoid valve 92 and a manually adjustable valve 94 in the injector 86 to the pump 68. A valve stem 93 extends upwardly through the housing 64 and terminates in a manually operable handle 96. As seen in FIG. 8, a passage-way 98 in the injector 86 is open to the flow of cleaning solution through the conduit 90 to the piston head chamber 82. A poppet valve 100 is disposed between the conduit 90 and the piston head chamber 82 and is adapted to open against the action of a spring 102 upon the piston head 80 moving in its expansion half cycle thereby creating a negative pressure in the chamber 82 to draw the cleaning solution through the conduit 90 into the chamber 82 through the poppet valve 100. The selectively adjustable valve 94 is adapted to meter out cleaning chemicals at the rate of approximately two ounces per gallon of water for each number on the dial as indicated by the markings 104 (FIG. 5).

As seen in FIG. 8, a water source is connected through a conduit 106 to the inlet opening 70 in the pump 68. A normally closed solenoid valve 108 is disposed in the water inlet conduit 106. An outlet conduit 109 is connected to

the outlet opening 72 on the pump assembly 68 and supplies either water or a mixture of water and a cleaning solution to a wand 110 having an outlet nozzle 112.

An electrical control box 114 is mounted on the frame 60 and includes some of the circuitry shown in the schematic of FIG. 10. An electrical power supply (not shown) is connected to the control box 114 through the inlet wires 116. Power supply is connected to one side of a relay 120 which may be closed by moving a trigger switch control 124 to either the position 126 or the position 128. When the switch 124 is moved to the position 126, a circuit from the electrical source is closed through the motor 76, the water solenoid valve 108 and the relay 120. However, when the switch is moved to the position 128, not only is the motor and the water valve circuit closed but also a circuit which includes a step-down transformer 130 and the chemical cleaning solution solenoid valve 92. Thus it is seen that the solenoid valve 92 is operated from the 24 volt supply as opposed to the conventional line voltage of 115 volts which operates the water solenoid valve 108. Also it is seen that in either of the positions 126 or 128 the motor 76, the water solenoid valve 108 and the pump 68 are continuously operated. Additionally, the cleaning solution solenoid valve 92 may be operated to open the cleaning solution conduit 90 to provide for mixing of the chemicals 132 with the water in the piston head chamber 82 and thus provide a cleaning solution at the discharge or outlet opening 72 of the pump. The water solenoid valve 108 is normally closed to protect the pump 68 from the water line pressure in the conduit 106.

Thus it is seen that by the embodiment of this invention illustrated in FIGS. 5-10, a most simplified cleaning machine has been provided which will readily supply a chemical cleaning solution at the nozzle 112 or a rinse water solution as desired. The chemical cleaning solution may be selectively varied by the manual valve 96 to provide the desired mixture.

Some changes may be made in the construction and arrangement of my portable cleaning machine without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. A portable cleaning machine, comprising,
 - a frame having ground supporting structure,
 - a pump driven by a motor on said frame, said pump having inlet and outlet openings, a conduit connected to said inlet opening and adapted to be connected to a water source,
 - a cleaning solution conduit in communication with said pump,
 - a valve in said water conduit for opening and closing said water conduit to the flow of water to said pump,
 - a valve in said cleaning solution conduit for opening and closing said cleaning solution conduit to the flow of cleaning solution to said pump,
 - said pump being a double acting piston pump having a pair of pistons movable between a pair of oppositely disposed piston head assemblies,
 - said motor being connected to said pair of pistons to reciprocate said pair of pistons,
 - said cleaning solution conduit being connected directly to one of said piston head assemblies,
 - said inlet and outlet openings being in communication with each of said piston head assemblies, and each of said piston head assemblies having one way inlet and outlet valves for limiting the flow of fluid only into said head assemblies from said inlet opening and limiting the flow of fluid only out of said head assemblies through said outlet opening.
2. The structure of claim 1 wherein said valve in said cleaning solution conduit is manually adjustable to vary the flow through said cleaning conduit to said one piston head assembly,

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3. The structure of claim 2 wherein a solenoid valve is provided in said cleaning solution conduit for opening and closing said cleaning solution conduit to the flow of solution to said one piston head assembly.

4. The structure of claim 3 and said manually operable valve has an elongated stem extending through said housing and a handle is provided on the exterior of said housing for operating said manual valve for selectively adjusting said valve.

5. The structure of claim 4 and a poppet valve in said cleaning solution conduit to limit flow of solution only into said one head assembly.

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EDWARD L. ROBERTS, *Primary Examiner*.

U.S. Cl. X.R.

134—100; 239—302