

Sept. 25, 1962

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3,055,031

POLISHING MACHINE WITH AEROSOL DISPENSER

Filed Jan. 16, 1961

Fig. 2

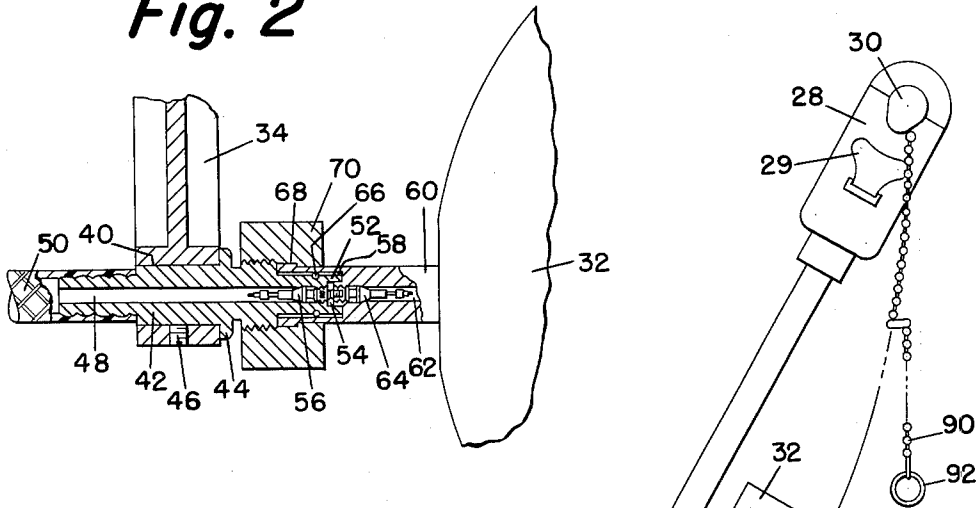


Fig. 1

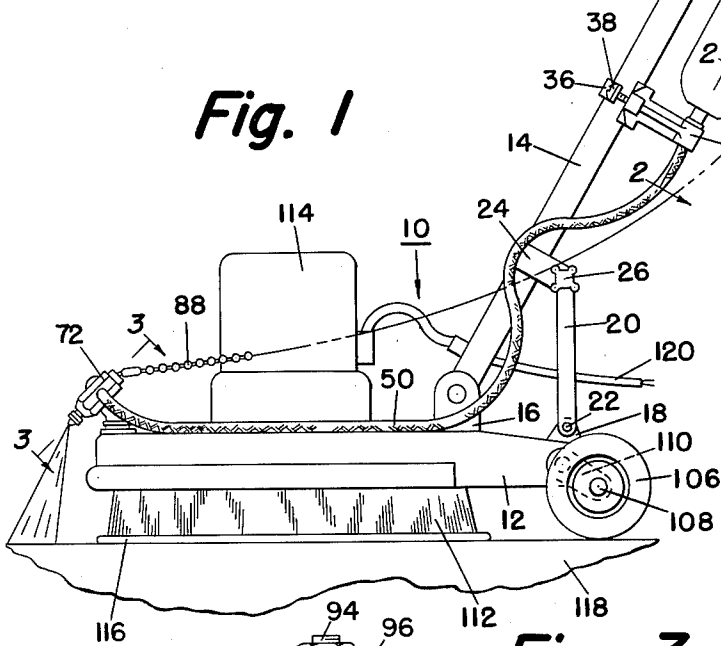
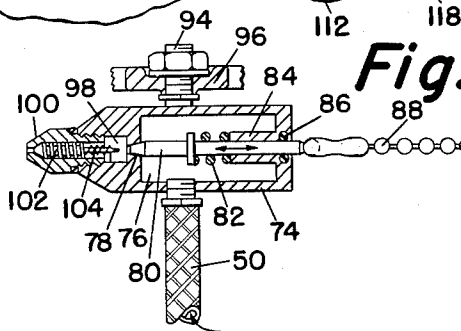


Fig. 3



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3,055,031

POLISHING MACHINE WITH AEROSOL DISPENSER

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Filed Jan. 16, 1961, Ser. No. 83,031
6 Claims. (Cl. 15—50)

This invention relates to a polishing machine with an aerosol dispenser, and more particularly to a polishing machine having an aerosol container of wax mounted thereon and a means for selectively dispensing the wax onto a floor adjacent the polishing machine in the form of an aerosolized foam.

This application is a continuation-in-part of my copending application Serial No. 38,573 filed on June 24, 1960 for Polishing Machine With Aerosol Dispenser.

The polishing machine in the aforesaid copending application has performed satisfactorily. The present invention provides several improvements over the polishing machine in said copending application thereby providing a superior machine which is less likely to get out of order or require repairs.

The present invention includes a transparent nylon conduit reinforced with nylon thread extending between the aerosol container and the valve mounted on the polishing head. One end of the conduit and the outlet of the aerosol container are each provided with a Schrader valve so that uncoupling of the conduit from the container automatically results in the prevention of escape of wax. I have found that it is necessary to provide a coupling having valves of the Schrader type since the Freon and the wax cannot withstand cold temperatures. Thus, provision has been made so as to enable the aerosol container to be quickly and easily disassembled from the polishing machine so that it may be brought indoors or disposed in a warm room when the machine is not in use.

The end of the conduit adjacent the aerosol container has also been provided with a Schrader valve. When the aerosol container is removed from the machine, the pressurized wax within the conduit cannot escape to the atmosphere. The provision of a manual valve of the type as shown in the above-mentioned copending application requires the attention of an operator. Occasionally, an operator forgets to close the valve. As a result thereof, the pressurized wax within the conduit is discharged onto the floor.

It is an object of the present invention to provide a novel polishing machine having an aerosol dispenser.

It is an object of the present invention to provide a novel polishing machine capable of polishing floors without interfering with the activities being carried on within the building in which said floors are located.

It is another object of the present invention to provide a polishing machine with an aerosol dispenser which takes advantage of the vibratory motion generated by a motor on said machine.

It is still another object of the present invention to provide a polishing machine with an aerosol dispenser capable of dispensing wax in the form of aerosolized foam.

It is still another object of the present invention to provide a polishing machine with an aerosol wax dispenser

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having a nozzle positioned at a remote point from the container for the wax.

It is another object of the present invention to provide a polishing machine with an aerosol wax container having an outlet valve responsive to the coupling of a conduit thereto.

Other objects will appear hereinafter.

For the purpose of illustrating the invention there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a side elevational view of the polishing machine of the present invention.

FIGURE 2 is a sectional view taken along lines 2—2 in FIGURE 1.

FIGURE 3 is a sectional view taken along lines 3—3 in FIGURE 1.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown in FIGURE 1 a polishing machine designated generally as 10. The polishing machine 10 comprises a brush housing 12 which is adapted to be generally horizontal with relation to the floor. A shaft 14 is pivotably secured at one end to an ear 16 on the housing 12. The housing 12 is provided with an ear 18 spaced from the ear 16 and in line therewith. A link 20 is pivotably secured at one end to the ear 18 by pin 22. The other end of the link 20 is pivotably secured to a sleeve 24. The sleeve 24 is slidably mounted on the shaft 14. The position of the sleeve 24 can be selectively fixed with relation to the shaft 14 by manipulation of the lock handle 26.

The end of the shaft 14 remote from the brush housing 12 is provided with a handle 28. The handle 28 is provided with a trigger 29 and a pair of handle arms 30, only one handle arm is shown. The purpose of the trigger 29 will be disclosed hereinafter.

Means are provided for removably mounting a sealed pressurized aerosol container 32 on the shaft 14. Said means comprises a mounting post 34 and a mounting collar 36 spaced from each other with concave surfaces disposed in abutting contact with diametrically opposite portions of the shaft 14. The mounting post 34 is provided with a pair of threaded holes. Mounting bolts 38 extend through apertures in the mounting collar 36 into the threaded holes of the mounting post 34 on opposite sides of the shaft 14. By manipulating the mounting bolts 38, the position of the mounting post 34 may be adjusted longitudinally along the length of the shaft 14.

As shown more clearly in FIGURE 2, the end of the mounting post 34 remote from the shaft 14 is provided with a bore 40.

An adaptor 42 is disposed within the bore 40 with a flange 44 on the adaptor 42 being in abutting contact with a planar surface on the mounting post 34. The adaptor 42 is retained within the bore 40 by means of the set-screw 46.

The adaptor 42 is provided with a passage 48 extending longitudinally therethrough. The adaptor 42 has a reduced diameter end portion fixedly secured to and extending into one end of a conduit 50. The conduit 50 is preferably a transparent synthetic resin such as nylon and preferably is reinforced with nylon thread as shown by the criss-cross marks on the conduit 50.

The end 52 of the adaptor 42 is a reduced diameter portion. The end 52 is provided with a counterbore 54 which is concentric with the bore 48. A Schrader valve 56 is threaded within the end portion of bore 48 adjacent the counterbore 54 with the actuator stem on the valve 56 extending into the counterbore 54.

The end 52 on the adaptor 42 extends into a counterbore 58 on the outlet conduit 60 of the container 32. The outlet conduit 60 is provided with a bore 62 which is in line with the bore 48. A Schrader valve 64 is threadably mounted within the bore 62 adjacent the counterbore 58. The innermost end of the counter-bore 58 is annular in transverse cross section thereby defining an annular flange which extends into the counterbore 54. Thus, in the position of the elements shown in FIGURE 2, the actuator stems on the valves 56 and 64 are in abutting engagement thereby permitting flow of wax from the container 32 to the conduit 50.

The outer peripheral surface of the end 52 is provided with a groove. An O-ring seal 66 is disposed within the groove on the end 52. The end 52 is disposed within the counterbore 58 on the outlet conduit 60. The free end of the outlet conduit 60 is provided with a flange 68 and is abutting contact with an enlarged diameter portion of the adaptor 42. A bushing 70 surrounds the outlet conduit 60 and is provided with a shoulder in abutment with the flange 68. The inner peripheral surface of a counterbore on the bushing 70 is threadably engaged with threads on the outer peripheral surface of said last mentioned enlarged diameter portion on the adaptor 42. As shown more clearly in FIGURE 1, the container 32 is mounted on the shaft 14 solely by the above described mounting for the outlet conduit 60.

The end of the conduit 50 remote from the container 32 is connected to a valve 72. The valve 72, as shown more clearly in FIGURE 3, includes a valve housing 74 having an inlet chamber 76 in communication with the conduit 50. One end of the inlet chamber 76 is defined by a wall having a tapered bore 78 extending there-through. The tapered bore 78 defines a valve seat which cooperates with a tapered head on a valve stem 80 to selectively control flow through the valve 72. A spring 82 within the inlet chamber 76 extends between a boss 84 and a flange on the valve stem 80. Thus, the spring 82 biases the tapered head on the valve stem 80 into engagement with the tapered valve seat.

The end of the valve stem 80 remote from the tapered head extends through the boss 84 and out of the housing 74. Said last mentioned end of the valve stem 80 is sealed to the housing 74 by means of the O-ring seal 86. The end of the valve stem 80 which extends out of the housing 74 is connected to one end of a chain 88. The other end of the chain 88 is connected to one of the handle arms 30. A chain 90, smaller than chain 88, is connected to chain 88 at a point spaced from said other end of the chain 88. A ring 92 is connected to the chain 90.

A threaded mounting arm 94 extends from the valve housing 74 as shown more clearly in FIGURE 3. The threaded mounting arm 94 extends through a hole in the mounting post 96 and is secured thereto by means of a threaded nut. The mounting post 96 is removably secured to the upper surface of the brush housing 12 adjacent a peripheral surface thereof. Thus, the angle of the valve 72 with respect to the upper surface of the brush housing 12 may be adjusted by means of the threaded mounting arm 94 and mounting post 96. Preferably, the valve 72 is disposed at an angle as shown in FIGURE 1 so as to dispense aerosolized wax foam in the shape of a cone adjacent the machine 10 as shown in FIGURE 1.

The valve housing 74 is provided with an outlet chamber 98. The bore 78 extends between the inlet chamber 76 and the outlet chamber 98. An aerosol nozzle 100 is threadably mounted within the outlet chamber 98. The nozzle 100 is provided with an axial bore. A pin 102 is

disposed within the axial bore of the nozzle 100. As shown in FIGURE 3, the pin is provided on its outer peripheral surface with a continuous spiral ridge thereby providing a spiral flow passage between the pin 102 and the axial bore of the nozzle 100. The spiral flow passage for the wax enables the wax to be dispensed in the form of a cone. The end of the pin 102 adjacent the outlet chamber 98 is a reduced diameter portion having a spring 104 extending therearound. One end of the spring 104 extends to the inner peripheral wall of the outlet chamber 98. Said last mentioned end of the spring 104 is useful in cleaning the nozzle 100 and prevents the pin 102 from sliding out of the axial bore of the nozzle 100 when the nozzle 100 is in an upright position.

The machine 10 of the present invention is provided with wheels 106 pivotably mounted on a pin 108. The pin 108 is fixedly secured to a pivotable link 110. The link 110 is capable of being pivoted to a position as shown in FIGURE 1 whereby the weight of the machine 10 is supported by the brush 112. The brush 112 is rotatably mounted within the brush housing 12 and is driven by a motor 114. Preferably, a pad 116 is disposed between the brush 112 and the floor 118 which is to be polished.

The aerosol container 32 is provided with a wax solution dissolved in Freon 12 under approximately eighty pounds per square inch of pressure. All of the constituents of the wax are dissolved by the Freon 12 which is the propellant for dispensing the wax solution out of the container 32.

The polishing machine 10 of the present invention is utilized in the following manner:

A commercially available abrasive pad 116 is disposed on a floor 118. The machine 10 is wheeled to the position of the pad 116 and positioned so that the brush 112 is disposed over the pad 116. The wheels 106 are pivoted to the position shown in FIGURE 1 so that the weight of the machine 10 is distributed to the brush 112. The lock handle 26 is loosened and the shaft 14 is pivoted with relation to the brush housing 12 to an angle as shown in FIGURE 1. The angle of the shaft 14 will depend upon the height and preferences of the operator. The flexibility of the conduit 50 and the provision thereof of a length greater than is needed permits the pivotable movement of the shaft 14 without interfering with the operativeness of the dispensing system.

When the shaft 14 has been positioned to the likeness and preferences of the operator, the lock handle 26 is then tightened. Then the end of the cord 120 (not shown) is plugged into an electrical receptacle. The operator will then manipulate the chain 90 and 88 by means of the ring 92 so as to move the valve stem 80 to an open position thereby permitting the wax solution to be dispensed through the nozzle 100 onto the surface of the floor 118 in the form of an aerosolized foam.

The operation of the valve 72 permits the wax solution to be dispensed under the pressure of the Freon 12. The operator will then exert an upward pull on the trigger 29 with his fingers and thereby actuate the motor 114 which drivingly rotates the brush 112 and the pad 116. The machine 10 is then manipulated by the operator so that the pad 116 is disposed over the foam wax solution on the floor. The rotary movement of the brush 112 and the pad 116 removes the old wax from the floor and polishes the floor with a continuous film of wax having a high luster.

The Freon 12 which was in solution with the wax evaporates so that the rotary movement of the pad provides a continuous film of high luster wax instead of a series of minute spots of high luster wax. The wax solution will dry almost immediately so that a person may walk on the waxed portion of the floor. Thus, the waxing of the floor may be accomplished without interrupting the activities of the persons utilizing the floor such as customers in a department store. Scuff marks are readily removed and the film of wax provided on the floor is

noticeably devoid of any slippery characteristics. Therefore, the continuous film of wax does not present a danger for persons walking on said film of wax immediately after being deposited and polished.

After a small portion of the floor has been polished, the chain 88 is again pulled toward the operator thereby moving the valve stem 80 to an open position so as to deposit a small amount of aerosolized foam wax on the floor 118 adjacent to the polished portion. In each instance, when such a small amount of aerosolized foam wax has been deposited, it will be appreciated that the operator releases the chain 88 so that the spring 82 may bias the tapered head on the valve stem 80 into engagement with the valve seat 78.

The above procedure is repeated until the entire floor has been cleaned and polished. Thereafter, the pad 60 will be removed and a buffing pad will be substituted therefor. Then the operator will buff and polish the cleaned and waxed portion of the floor.

Freon 12 is substantially an unstable fluid and tends to separate from the wax. The vibration from the motor 114 is transmitted to the aerosol container 32 so as to maintain the Freon 12 in solution with the wax. The Freon 12 must remain in solution with the wax so as to obtain a high luster on the polished floor and so that the wax solution may be dispensed in the form of an aerosolized foam. Also, it should be noted that the Freon 12 is the dispensing agent which forces the wax solution out of the container 32.

The valve 72 is necessary and must be positioned at the end of the conduit 50 remote from the container 32 so as to provide the necessary control over the wax solution thereby preventing waste. The nozzle 100 must be adjacent the valve 72 so as to prevent dripping when the valve 72 is preventing the flow of the wax solution.

As pointed out above, it has been found desirable to remove the container 32 from the machine 10 when the machine 10 is not in use. Accordingly, the provision of Schrader valves in the outlet conduit 62 and in the adaptor 42 enables the container 32 to be readily dismantled. The valves 56 and 64 will prevent flow when the container 32 is dismantled from the machine 10 of the present invention. When the container 32 is dismantled from the machine 10, the valve 56 prevents the pressurized wax solution from being discharged through the adaptor 42. Thus, the machine 10 of the present invention does not rely on the attentiveness of the operator to prevent the loss of pressurized wax solution within the conduit 50 when the container 32 is removed from its position shown in FIGURE 1.

I have found it desirable to provide a rubber sleeve between the shaft 14 and the mounting post 34 thereby providing a resilient mount for the container 32. A resilient mount for the container 32 assists in maintaining the Freon 12 in solution with the wax within the container 32.

Thus, it will be seen that the applicant has provided a polishing machine having an aerosol dispenser of wax mounted thereon. The wax is adapted to be dispensed onto a floor adjacent the machine 10 in the form of an aerosolized wax foam. Provision has been made so that the aerosol container 32 may be dismantled from the machine 10 in an expeditious manner without the loss of any of the wax solution. The machine 10 is capable of removing dirt, scuff marks, and old wax while simultaneously applying the wax foam to the floor as a continuous film of wax. The continuous film of wax is capable of drying almost immediately and thereby permits persons to walk on the newly waxed portion of the floor without slipping. Thus, the methods used heretofore involving mops, pails, etc. for cleaning of floors and the removal of scuff marks and old wax can be eliminated. The present machine enables the floors of a building to be cleaned and polished at the same time during business hours without interruption of the activities on the floors in said buildings.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. A polishing machine comprising a brush housing, a brush beneath said housing, a motor mounted on said housing, means connecting said motor to said brush for rotating said brush, means connected to said motor for operating the same, a shaft extending from said housing, said shaft being pivotably secured at one end to said housing, a handle on the other end of said shaft, a sealed pressurized aerosol container for a wax solution fixedly secured relative to said shaft, a conduit having one end adjacent an outlet on said container, a valved coupling means providing communication between said container and said one end of said conduit, said valved coupling means preventing discharge from said one end of said conduit and said container when said container is removed from its securement with respect to said shaft, the other end of said conduit being connected to a valve mounted on said brush housing, an actuator for said valve extending to said handle, a nozzle at the outlet end of said valve, said nozzle being directed in a direction so that wax is deposited under pressure as an aerosolized foam on a floor adjacent to said housing when said valve is open.

2. A polishing machine in accordance with claim 1 wherein said valve coupling means includes an adaptor adjustably mounted on said shaft, one end of said adaptor being in communication with said one end of said conduit, the other end of said adaptor having a spring biased valve, said outlet on said container having a spring biased valve, and means for coupling said outlet on said container to said adaptor, said spring biased valves moving to an open position when said outlet is connected to said adaptor.

3. A polishing machine in accordance with claim 1 wherein said valve mounted on said brush housing is provided with a mounting arm, said mounting arm being rotatably connected to a mounting post whereby the angle of said nozzle relative to said brush housing may be adjusted.

4. In a polishing machine having a brush housing, a brush beneath said housing, a motor mounted on said housing operatively connected to said brush for rotating said brush, a shaft extending from said housing and pivotably secured thereto at one end of said shaft, a handle on the other end of said shaft, a dispensing system comprising a mounting post adjustably secured to said shaft intermediate its ends, an adaptor fixedly secured to said mounting post, an aerosol container coupled to one end of said adaptor, the coupling of said container to said adaptor being the sole means for securing said container relative to said shaft, valves in said adaptor and an outlet on said container biased to an open position by said coupling of said container to said adaptor, a conduit having one end connected to said adaptor in communication with the interior of said container, the other end of said conduit being connected to a valve mounted on said brush housing adjacent the periphery of said brush housing, a nozzle connected to an outlet chamber in said valve, an actuator extending from said valve toward said handle, said nozzle being directed in a direction so that the contents of said container are dispensed under pressure as an aerosolized foam on a floor adjacent said brush housing when said valve is manipulated to an open position by said actuator.

5. In a polishing machine in accordance with claim 4 wherein said nozzle includes an axial bore, a pin within said axial bore, ridges on said pin providing a spiral passage through said axial bore, whereby the contents of said container are dispensed in the form of a cone.

6. A polishing machine comprising a brush housing, a shaft having one end connected to said housing, a handle on the other end of said shaft, a sealed imperforate pres-

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surized aerosol container for a wax solution fixedly secured to said shaft, a conduit having one end adjacent an outlet on said container, a valved coupler means providing communication between said container outlet and said one end of said conduit, said valve coupler means preventing discharge from said one end of said conduit and from said container outlet when said container is removed from its securement with respect to said shaft, the other end of said conduit being connected to a valve mounted on said brush housing, an actuator for said valve extending toward said handle, a nozzle on the outlet side

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of said valve, said nozzle being directed in a direction so that wax may be deposited under pressure as an aerosolized foam on a floor beyond the periphery of said housing when said valve is open.

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