

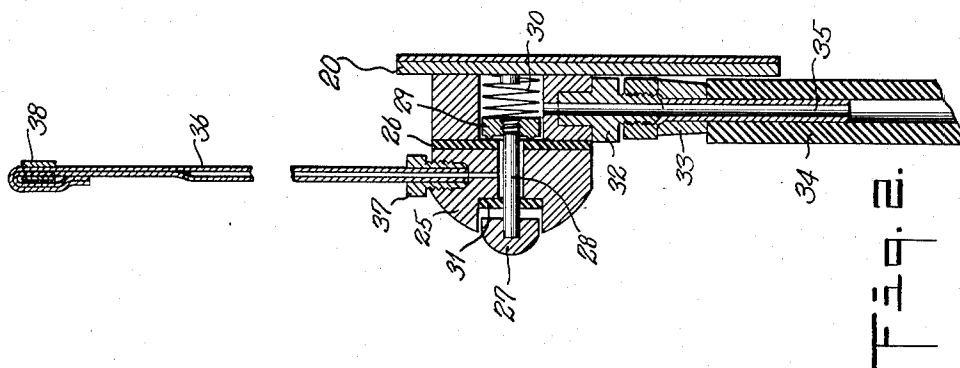
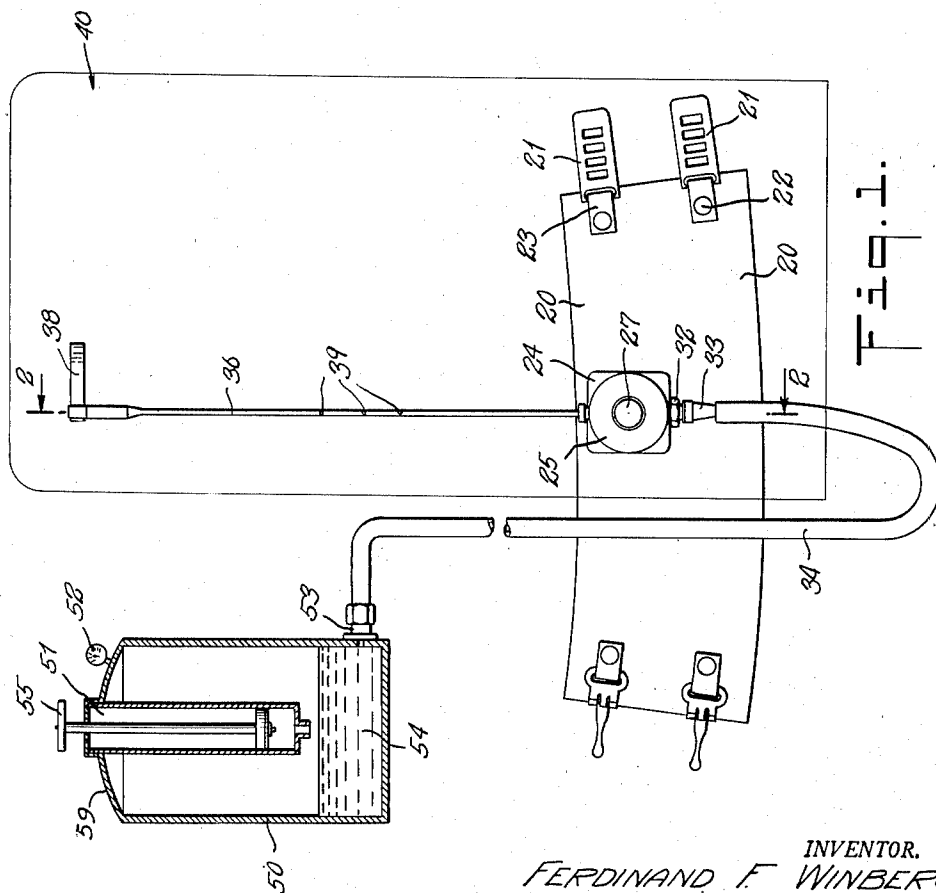
Feb. 23, 1954

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SURFACE CLEANING TOOL

2,669,739

Filed July 30, 1947

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

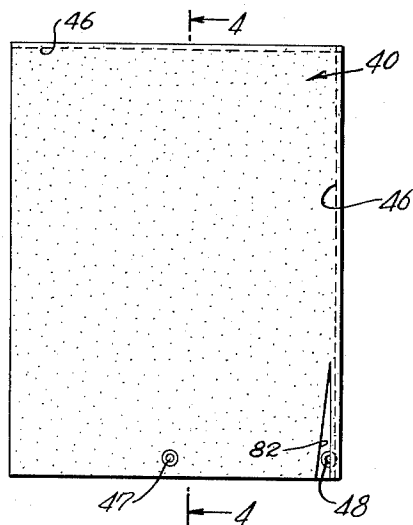


Fig. 3.

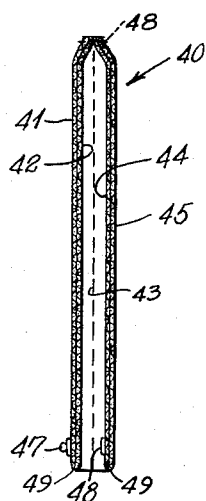
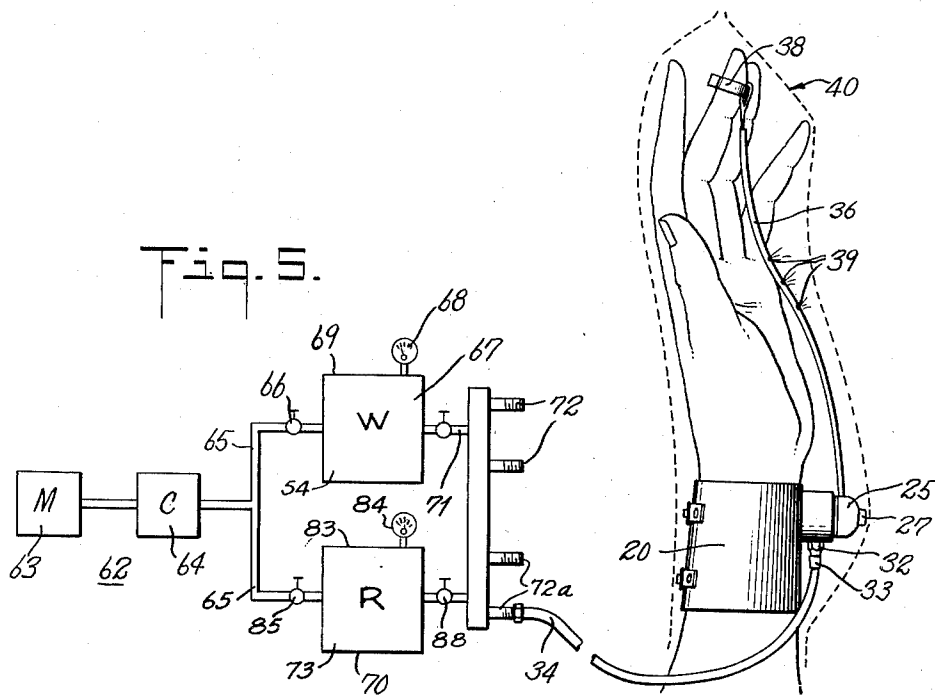


Fig. 4.



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## UNITED STATES PATENT OFFICE

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## SURFACE CLEANING TOOL

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9 Claims. (Cl. 15—128)

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This invention relates to improvements in surface cleaning tools.

Heretofore, it has been the practice to clean flat surfaces such as walls, with a trowel supplied with fluid under pressure. Such devices being rigid in construction are limited in their application to flat surfaces and can not be used for cleaning irregular surfaces such as moldings, window frames, automobile bodies and the like.

The object of this invention is a cleaning tool for cleaning irregular surfaces.

In the drawings comprising two sheets of fine figures, numbered Figs. 1 to 5, inclusive, certain embodiments of the invention are set forth by way of illustration only.

Fig. 1 is a plan view of the cleaning tool with the mitten in ghost outline associated with one suitable form of pressure tank;

Fig. 2 is a cross-sectional view taken along the line 2—2 of Fig. 1, looking in the direction of the arrows;

Fig. 3 is a plan view of a suitable form of mitten;

Fig. 4 is a cross-sectional view taken along the line 4—4 of Fig. 3, looking in the direction of the arrows; and

Fig. 5 is a diagrammatic view of a system employing the cleaning device.

Like reference characters designate corresponding parts throughout the several figures of the drawings.

Referring generally to Figs. 1 and 2, the device includes a wrist band 20 which may be of felt-lined leather, provided with a series of adjustable buckles 21 attached to said wrist band 20 in any preferred manner as by means of the rivets 22 and leather straps 23. A valve mechanism is supported upon the wrist band 20 in any suitable manner as by means of screws or rivets (not shown). The valve mechanism consists of a lower valve block 24 and an upper valve block 25 maintained in sealing contact by a gasket washer 26. The valve outlet is normally sealed off by a valve plunger 29 under control of a compression spring 30. The valve plunger 29, may be forced off its seat by the valve stem 28 under pressure exerted by the push button 27. A rubber washer 31 seals off the valve stem 28 to prevent leakage of any liquid passing through the valve under pressure. A suitable nipple which may be of brass or other material, is suitably secured in the lower valve 24 and is provided with a flared hose connector 33 for the hose line 34. A flared copper ferrule 35 extends through the hose line 34 into the flared hose 33.

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A flexible palm hose 36 is suitably connected to the valve outlet formed in the upper valve block 25. The palm hose 36 may be attached to the valve block in any suitable manner as by means of a threaded ferrule 37. The flexible palm hose is of suitable length to extend across the palm of the hand and along the index finger thereof, and is sealed off at the distant end. A finger band 38 which may be of elastic, is attached to the outer extremity of the palm hose 36 to enable the end of the hose to be retained upon the tip of the finger as best illustrated in Fig. 5. A row of spray holes 39 are formed in the wall of the palm hose 36 to enable the liquid cleanser which is continuously supplied from the hose 34, under pressure, to be sprayed through the spray holes 39 so as to moisten the mitten 40 which encases the hand (see Fig. 5).

The mitten 40 may consist of two plies of terry cloth or other similar flexible porous material, which may be folded in any desired manner, as by doubling the terry cloth along the line 49, to form a double ply of terry cloth, and then securing the two plies of terry cloth together by sewing a line of stitches 43 (Fig. 4) through the middle of both plies of the doubled-over material, at right angles to the line 49, then folding the double-ply along the line of the stitches 43, to bring the free edges of all four plies 41, 42, 44 and 45, into registry, and securing said free edges of all four plies together by sewing the lines of stitches 46, 46 through all four plies to complete the mitten 40. The mitten may be slitted at the wrist line at 82, and provided with a snap 47 and a hollow fastener 48, to enable the open end 82 of the mitten 40 to be fastened at the wrist so as to cover the valve mechanism carried by the wrist band 20.

A pressure tank 50 including a pressure pump 51, cover member 59, and pressure gauge 52, is provided with an outlet 53 for a hose connection for the opposite end of the hose 34. The tank 50 contains either a suitable cleansing liquid 54, or a suitable rinsing liquid which is forced into the hose line 34 under pressure supplied to the pressure tank 50 by means of the pump handle 55.

In operation, the cleansing fluid 54 or the rinsing liquid, as the case may be supplied under pressure from the pressure tank 50, flows through the hose 34 to the valve plunger 29 which seals off free passage of the liquid into the flexible palm hose 36. When, by the application of wrist pressure, the push button 27 is pressed against the surface to be cleaned, the valve plunger 29 opens and permits the cleaning liquid 54 (or the

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rinsing liquid) to enter the flexible palm hose 36 with sufficient pressure to form a spray which passes through the spray holes 39 and moistens the mitten 40. The cleansing liquid 54 (or the rinsing liquid) passes through the flexible porous mitten and is applied to the irregular surface to be cleaned. By careful manipulation of the push button 27, a critical control can be maintained over the passage of the cleaning liquid 54 (or the rinsing liquid) so that only a minute quantity of liquid is used which is insufficient to drip from the irregular surface or run down along the arm of the operator.

In the modification shown in Fig. 5, the cleaning device of Fig. 1 is shown as one of a series, and each hose line 34 is adapted to be attached to one of the multiple taps 72 of a valve controlled outlet 71, or to one of the multiple taps 72a of a valve controlled outlet 80, of a pressure unit. The pressure unit may consist of a compressor 62 including a suitable motor 63 and a compressor 64 connected by a common pipeline 65 and pressure control valve 66 to a pressure tank 67 which may be supplied with the conventional pressure gauge 68 and a removable cover member 69 through which the cleaning liquid 54 may be supplied to the flexible palm hose 36 of the cleaning device. Another pressure tank 70 is connected to the common pipeline 65 of compressor 64 through a separate pressure control valve 85. Tank 70 also includes a removable cover member 83 and a pressure gauge 84, and contains the rinsing fluid 73 which may be supplied to the cleaning device under pressure through the outlet valve 86 and the multiple taps 72a. With the system of Fig. 5, several operators provided with cleaning devices are connected to the tank 67 containing the cleaning liquid 54 and other operators equipped with the cleaning devices are connected to the rinsing tank 70 containing the rinsing liquid 73. The first group of operators would proceed to work over the surface to be cleaned with the cleaning fluid 54 and are then followed by the second group of operators who would apply the rinsing fluid 73 to the cleaned surfaces. The multiple taps 72 and 72a are separate lines, but they may be linked together through a shut-off valve (not shown). This system is particularly useful for effecting the rapid cleaning of large areas.

The pressure applied to the liquid cleanser and wetting agent may vary according to conditions. A pressure of thirty pounds gives good results.

The removed dirt is collected by the mitten. When one face is soiled, the mitten may be turned over and also turned inside out until all four faces are soiled, when it may be replaced by a clean mitten. Soiled mittens may be washed out and used over until worn out.

What is claimed is:

1. In a hand manipulated cleaning tool the combination of a normally closed plunger-operated shut-off valve, means for securing said valve to the front of the wrist with the plunger facing outwards whereby continued forward motion of the wrist towards the surface to be cleaned actuates the plunger against said surface to open the valve, a flexible tubing connected to the valve outlet, and said tubing having a plurality of restricted openings formed therein for feeding liquid-cleanser, supplied to said tubing when said valve is open, to the hand.

2. In a hand manipulated cleaning tool the combination of a normally closed plunger-operated valve, means for mounting said valve upon

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the front of the wrist with the plunger protruding so that sustained forward motion of the wrist towards the surface to be cleaned actuates the plunger against said surface thus opening the valve, a flexible tube connected to the valve outlet, said tube being long enough to extend across the palm of the hand and along a finger, said tube being closed at its outer end, means for detachably attaching the outer end of said tube to said finger, and said tube having a plurality of restricted openings formed therein for feeding liquid-cleanser supplied through the open valve to the hand.

3. In a tool for cleaning a surface by rubbing said surface and in combination, a plunger-operated valve, means for strapping said valve upon the front of the wrist so that said valve plunger extends outwards from the front of the wrist, said plunger being operable, when pressed against the surface being cleaned by the sustained movement of the wrist towards said surface, to open said valve, a flexible tube connected to the valve outlet, said tube being long enough to extend across the palm of the hand and along a finger, said tube being sealed off at its outer end, means for detachably supporting the outer end of said tube upon the finger, and said tube having a series of restricted openings formed therein for supplying liquid-cleanser through the valve when open to the hand.

4. In a cleaning tool and in combination, a normally closed plunger-operated valve, a wristband, said valve being mounted upon the front of the wristband with the plunger extending outwards, said plunger being operable by the sustained forward motion of the wrist towards the surface to be cleaned to open the valve, a flexible tube connected to the valve outlet, said tube being long enough to extend loosely from the wrist to the region of the finger tips, said tube being closed at its outer end, means for detachably attaching the outer end of said tube to a finger, a reversible, interchangeable, mitten, made of soft, porous, liquid-absorbent, washable, material for covering the hand and the valve plunger, and said tube having a series of restricted openings formed therein through which liquid cleanser passing through the valve when open is conducted to and moistens the mitten.

5. In a manually operated tool for cleaning surface areas and in combination a plunger-operated valve, a wristband, said valve being mounted upon the front of the wristband with its plunger freely extended whereby sustained forward motion of the wrist towards the surface to be cleaned slidably actuates the plungers to unseat and open the valve, a flexible tube having one end connected to the valve outlet, said tube being long enough to extend loosely from the wrist to the region of the finger tips, said tube being closed at its opposite end and having a series of restricted openings formed therein through which liquid cleanser is sprayed when the valve is open, a loop attached to said tube near its closed end, and said loop being attachable to a finger to extend the tube.

6. In a surface cleaning tool and in combination a wrist band, a plunger actuated valve mechanism for controlling the passage of a wetting agent when said valve plunger is actuated, said valve mechanism being secured to the front of said wristband with said plunger facing outwards, a flexible tubing long enough to extend along the middle finger, said tubing being closed at its outer end and having its inner end con-

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ected to the valve outlet, said tubing having a plurality of restricted openings formed at spaced intervals lengthwise thereof through which a wetting agent when supplied under pressure may be sprayed, and said valve plunger being operable when pressed against the surface to be cleaned to actuate said valve mechanism and thus connect said valve inlet to said flexible tubing.

7. In a surface cleaning tool and in combination, a body made of soft, flexible, porous, dirt-absorbent, material, a wrist band, a valve mechanism attached to the front of said wrist band, means for fastening said wrist band around the wrist to center said valve mechanism in the front of said wrist, said valve mechanism being operable when pressed by the wrist against the surface to be cleaned to supply a wetting agent to the dirt-absorbent material, a piece of flexible tubing long enough for attachment to the middle finger, said tubing being closed at one end and having its opposite end connected to the valve outlet, means for detachably securing the closed end of said tubing to said middle finger, and said tubing having a row of holes extending along the tubing at spaced intervals to enable said wetting agent when supplied through the valve under pressure to saturate the dirt-absorbent material.

8. In a one - hand - and - wrist - manipulated cleaning tool and in combination a normally closed shut-off valve, means for mounting said valve on the front of the wrist of an operator's tool-manipulating hand, a flexible tube connected to the valve outlet, said tube being long enough to extend from the outlet of said wrist-mounted valve to the region of the finger tips of said tool-manipulating hand, means for holding said flexible tube in extended position, a soft, pliable, mitten made of a soft, pliable, porous, liquid-absorbent, washable, material for covering the relaxed tool-manipulating hand and the flexible tube, said tube having a plurality of restricted openings formed therein through which liquid cleanser is sprayed to moisten the mitten when the shut-off valve is opened, said mitten following the manipulations of said hand and fingers, said wrist-mounted valve being operable

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by manipulating said wrist at will, independently of the manipulation of the hand and fingers, to press said valve against the surface being cleaned to control the flow of the mitten-moistening cleanser, and said moistened mitten being variously compressible against the surface to be cleaned by manipulation of the hand and fingers substantially independently of wrist-manipulation of the valve.

9. In a one - hand - and - wrist - manipulated cleaning tool and in combination, a normally closed shut-off valve, means for securing said valve to the front of the wrist of an operator's tool-manipulating hand, a flexible tube connected to the valve outlet, said tube being long enough to extend from the outlet of said wrist-secured valve to the finger region of said tool-manipulating hand, means for retaining said flexible tube extended, a soft, pliable, mitten, made of a soft, pliable, porous, liquid-absorbent, washable, material, for enclosing the relaxed tool-manipulating hand and said flexible tube, said tube having a plurality of restricted openings formed therein through which liquid cleanser passes to moisten the mitten when the shut-off valve is opened, said mitten being moldable by manipulating said hand and fingers to conform to the configuration of the surface to be cleaned, and said wrist-secured valve being operable at will against said surface responsive to pressure exerted by manipulating said wrist relative to and substantially independent of the manipulation of said tool-manipulating hand, to open said valve against the surface being cleaned and thus control the flow of the mitten-moistening liquid cleanser.

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