UNITED STATES PATENT OFFICE.

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WINDOW-CLEANING MACHINE.


To all whom it may concern:

Be it known that I, JOSEPH BARON, a citizen of the United States, residing at Rockaway Beach, in the county of Queens and State of New York, have invented certain new and useful Improvements in Window-Cleaning Machines, of which the following is a specification.

This invention relates to window cleaning machines, and more particularly to that type of machines by which the outside surface of window panes are cleaned or washed by the operator standing inside of the building.

One of the main objects of the invention is to provide a simple and efficient machine of the character stated. A further object is to provide a machine which will use a minimum of water or other washing liquid during its operation. A still further object is to provide a machine having a squeegee or pane engaging member in combination with a spraying device, these two members being so related that the window is washed during one operation of the squeegee, and dried during the second operation of the squeegee. Further objects will appear from the following detailed description.

In the drawings:

Figure 1 is a side view of the invention as used.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 1.

Fig. 5 is a section on line 5—5 of Fig. 1.

Figs. 6 and 7 are details.

Broadly stated, my machine consists of a vertically sliding squeegee, a spraying device mounted above and carried by the squeegee, and means for operating the squeegee and simultaneously supplying liquid under pressure to the spraying device.

1 designates the base which is provided at its inner end with lateral arms 2 for bracing and steadying purposes, and near its outer end with similar arms 3. A suitable tower is mounted upon this base intermediate its ends. This tower is of U-shape having an inner leg 4 and an outer leg 5, both fixedly secured to the base. The outer leg is of channel construction and slidably receives the outer arm 6 of an adjustable U-head 7, the inner arm 7' of which is reduced as at 7'' and fits into a socket in the upper end of leg 4 of the tower. The outer arm 5 of the U-head is provided with a U-chap 8 fixedly secured thereto and embracing the outer leg 5 of the tower. A binding screw 9 is threaded through the bar 10 of the chap 8 so as to engage the leg 5 of the tower so as to secure the head 7 in vertical adjustment. A grooved pulley 11 is rotatably mounted in the inner eg of head 7 in alignment with a similar pulley 12 mounted in the lower end of leg 4 of the tower. Pulley 12 is secured on a longitudinal shaft 13 rotatably mounted in standards 14, and the upright 15 formed at the inner end of the base. Above shaft 13 a stub shaft 16 is rotatably mounted near the upper end of upright 15 and carries a drive pulley 17 keyed on its inner end, and a crank handle 18 secured on its outer end. Drive pulley 17 is in vertical alignment with a grooved pulley 19 secured on shaft 13 and is operatively connected thereto by a cord 20.

A sleeve 21 is secured on the outer end of shaft 19 and carries, at its outer end, an integral ratchet 22. A wheel 23 is loosely mounted on the shaft 19, between the ratchet 22 and the disk 24 fixedly secured to the outer end of the shaft. This wheel carries a pawl 25 adapted to engage the ratchet 22 when the shaft 19 is rotated in one direction, so as to cause rotation of the wheel therewith. The pawl is held in operative position by a spring 26 having its outer end secured through the lug 27 formed on the wheel, and its inner end in engagement with the pawl, in the usual manner. This construction will be clear from Fig. 6 of the drawings.

The wheel 23 carries an eccentric pin 28 which is connected by a link 29 to the lower end of the vertical arm of an angle rod 30. The lower end of this arm is provided with a short socket 31 secured thereto by a binding screw 32, the lower end of which is slotted to receive the upper end of link 29. The horizontal arm of rod 30 is slotted in the eye 33 of a socket 34 secured on the upper end of a piston rod 35. On the lower end of piston rod 35 is secured a piston 36 operative in the barrel 37 secured in the liquid supply tank 38. The pump barrel 37 is mounted on and secured to a cylindrical housing 39 secured to the bottom of tank 38 and provided with a plurality of apertures 40 communicating with the interior of the
tank. An opening 41 is provided through the top of housing 39 communicating with the interior of pump barrel 37 and is normally closed by a flap valve 42 mounted within the pump barrel. The pump barrel is further provided with an aperture 43 located a short distance above the bottom of the barrel and communicating with the bell 44 secured on the side of the barrel with which communicates a liquid discharge tube 45. This aperture 43 is closed by an outwardly opening flap valve 46 mounted within the bell 44. From this it will be evident that, when the shaft 13 is rotated in a direction to rotate wheel 23, liquid will be taken from the tank 38 and discharged through the tube 45 by the pump.

A centrally slotted block 47 is slidably mounted on the inner leg 4 of the tower, and is provided with apertured posts 48 into which are threaded binding screws 49. These posts are adapted to receive the end portions of a cord 50 passing over the pulleys 11 and 12 and secured to the block 47 by means of the screw 49. By this means vertical movement is imparted to the block by rotating the shaft 13. The slot of block 47 snugly receives a stout pin 51 secured at the longitudinal center of a horizontal yoke 52. A bolt 53 is inserted through slotted apertures in the block 47 and the pin 51, the aperture in the pin being so positioned that, when secured in position, the yoke 52 fits tightly against the inner edge of the block so as to be firmly secured against movement relatively thereto, as in Fig. 4. The arms 54 of the yoke are directed outwardly and each of these arms is provided at its outer end with an eye 55. Sleeves 56 are pivotally mounted in eyes 55 by means of integral screws 57 and thumb nuts 58 threaded thereon, each sleeve being provided with a bearing boss 59 concentric with pin 51. A rod 60 is slidably mounted in each sleeve 56 and has its outer end threaded to receive a nut 60. The inner end of each rod is secured to a rectangular bar 61 near the end thereof. A squeegee holder 62 is secured to rod 61 by means of U-clips carried by the holder and secured to the rod by means of binding thumb screws 63. This holder 62 carries the usual rubber strip or squeegee 64. The squeegee is normally held inward away from the carriage composed of the block 47 and yoke 52, by means of coil springs 65 mounted about the rods 59 and confined between the bar 61 and the inner ends of sleeves 56. This resilient mounting of the squeegee permits it to give outwardly and thus eliminates all danger of breakage of the pane being cleaned due to excessive pressure. The compression of the springs 65 can be varied by means of the nuts 58 so as to adjust the size of the squeegee, as will be clear from Fig. 4 of the drawings.

Mounted on the upper side of the squeegee holder 62, is the liquid spraying device. This device comprises a hollow rectangular sheet metal chamber 66 the inner edge of which is beveled downwardly and inwardly 70 as at 67 and provided with a plurality of perforations 68. This chamber 66 is provided with a rearwardly projecting nipple 69 over which is secured one end of a flexible tube 70, of rubber or other suitable material, the other end of which is secured over the outer end of the liquid discharge pipe 45.

In using my machine, the window is raised, the liquid tank, tower, and squeegee, being placed outside of the window, the base 1 resting on the window sill and serving to support these members, as shown. The window is then closed so as to bring the outer edge of the sash against the top of the U-housing 72 secured to the base 1 about the shaft 13. When in this position, the inner edge of the squeegee is in close contact with the outer surface of the window pane 73, as in Fig. 1. By turning the handle 18 so as to rotate shaft 13 in the proper direction, the squeegee is moved upward over the surface of the pane. At the same time, the pump mounted in tank 38 is operated, by means of the pawl 25 and ratchet 22, and the parts connected therewith. With each upward movement of the pump piston 36 a small amount of liquid is forced through the pipe 45 and tube 51 into the casing 66 and is projected through the aperture 65 in a number of very fine streams against the window pane. During the upward movement of the pump piston the liquid is not forced into and out of the casing 66, as the piston is drawing in a new supply of liquid through the opening 41, as will be clear from Fig. 2. During the upward stroke of the piston the squeegee 64 is moved a sufficient distance to rub or clean the surface against which the liquid 110 has been previously projected from the spraying device. On the downward travel of the pump piston the previous operation is repeated, that is, the liquid is projected forcibly against the surface of the window 115 pane in a number of small streams which unite to form a downwardly moving sheet of liquid driven with comparatively great force. This intermittent spraying of the washing liquid against the window pane 120 continues during the upward travel of the squeegees and, due to the fact that the spraying of the liquid is intermittent and not continuous, a considerable saving in the amount of liquid required is effected, while sufficient liquid to properly clean the window pane is provided by this means.

During the downward travel of the squeegee, the pawl 25 will not engage with the teeth of ratchet 22, so that the liquid pump 130
will not operate. During this movement the squeegee acts to wipe the window pane in the usual manner.

In order to insure proper operation of the 5 squeegee, forked brackets 74 are secured at the ends of yoke 52. These brackets project above and below the sleeves 56 so as to permit limited rocking movement of the same. This permits rocking of the squeegee so that, on its upward movement, it is inclined downward and inward at a slight angle, as in Fig. 1. This permits the water, or other liquid used, to act properly on the window pane, and to readily flow over the same from the ends of the squeegee. On its downward movement, the squeegee is rocked on the screw pin 57 so as to assume an upward and outward inclination. This places the squeegee at the proper angle to wipe the surface of the window pane.

The upper end of pump barrel 37 is closed by a tightly fitting cap 37a provided with apertures 37b. These apertures permit the entry and exhaust of air into the pump barrel above the piston 36, thus preventing the formation of a vacuum, and also permitting ready access to the interior of the pump when required. A bracket plate 75 is secured to the upper end of tank 38, adjacent to the pump barrel, and is apertured to receive the vertical arm of the angle rod 30, thus acting to guide and brace the same.

The tank 38 is provided, at its lower end, with U-guides 76 which receive guide ribs 33 formed on the sides of the base 1. These guides are threaded to receive binding screws 78 by means of which the tank is secured to the base and may be adjusted longitudinally thereon, within certain limits, if required.

A handle 79 is secured on the upper end of the upright 15 of base 1. This handle is intended to be held by the operator, while turning the crank 18 so as to rotate shaft 13, and is of material assistance in steadying the machine or for moving it toward or away from the window, as may be required.

It will be evident that certain changes can be made in the construction and disposition of the various elements of my machine without departing from the field and scope of the invention, and I intend to include all such variations within this application, in which a preferred form only of my invention is disclosed.

What I claim is:

1. In a window washing machine, the combination of a slidable carriage, a resiliently and rockably mounted squeegee carried by said carriage, a spraying device mounted above and carried by said squeegee, a source of supply of liquid, pumping means connected to said source of liquid supply and spraying device, and means for moving said carriage in either direction and for operating the said pumping means during the travel of the carriage in one direction.

2. In a window washing machine, the combination of a slidable carriage, a slidably and rockably mounted squeegee carried by said carriage, adjustable resilient means for holding the squeegee away from the carriage, a spraying device mounted above and carried by the squeegee, a source of supply of liquid, pumping means connected to said source of liquid supply and spraying device, and means for moving said carriage in either direction and for operating the said pumping means during the travel of the carriage in one direction.

3. In a window washing machine, the combination of a slidable carriage, a squeegee rockably mounted in said carriage, resilient means for holding the squeegee in operative position, a spraying device mounted above and carried by the squeegee, and means for moving the carriage and for supplying liquid to the spraying device under pressure.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH BARON.

Witnesses:
MAX REICH,
JULIUS LEVY.