

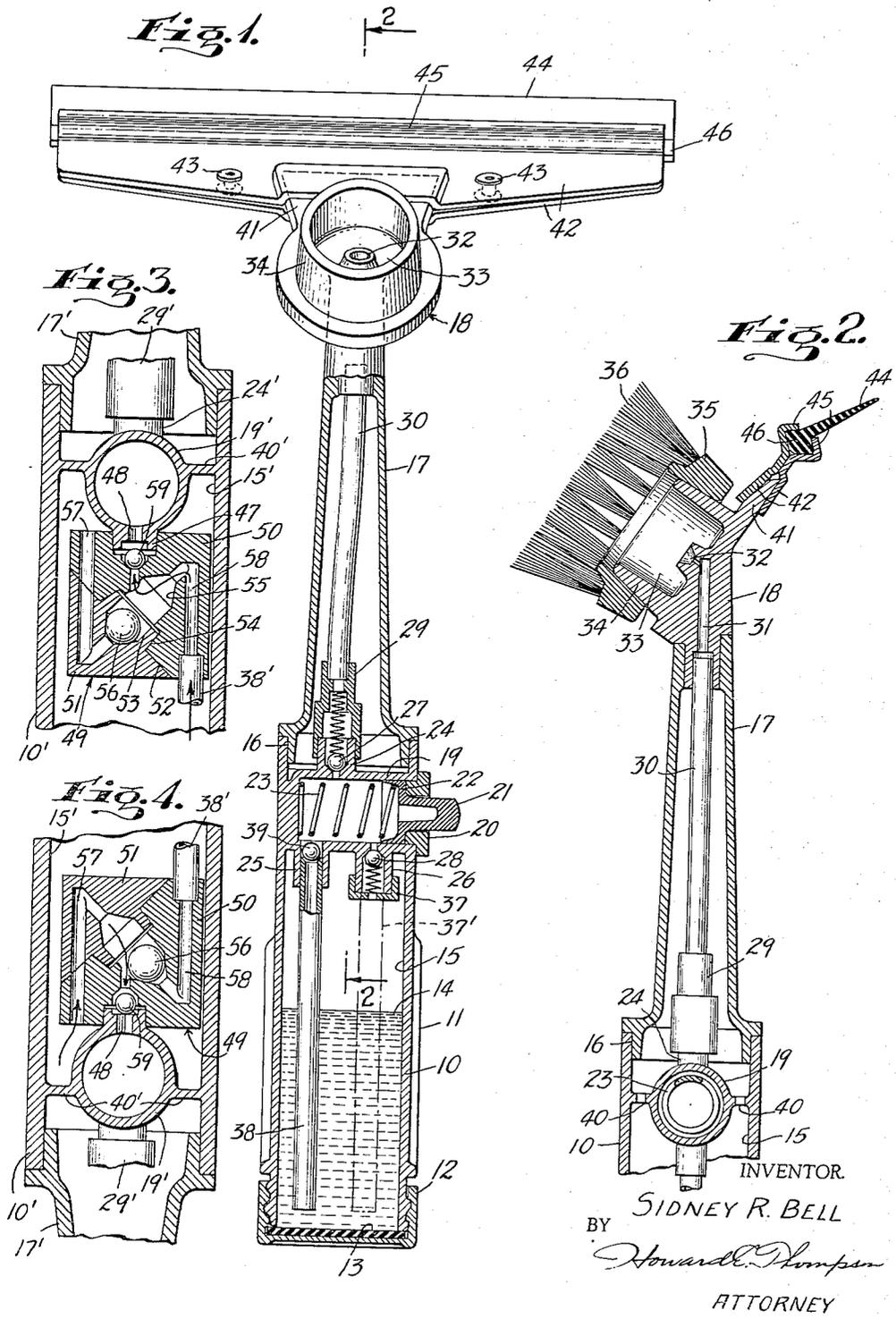
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S. R. BELL

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WINDOW CLEANING DEVICE

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INVENTOR.
SIDNEY R. BELL
BY *Howard L. Thompson*
ATTORNEY

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WINDOW CLEANING DEVICE

Sidney R. Bell, Stamford, Conn., assignor to Jet Brush Products, Inc., New York, N.Y., a corporation of New Jersey

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This invention relates to devices for cleaning windows, wherein the device includes a brush head, into which water can be discharged in the operation of cleaning and scrubbing a window and, further, a flexible wiper blade for finish cleaning the window or removal of water applied to the windowpane. More particularly, the invention deals with a device of the character described having means for manually pumping water from a reservoir in the handle of the device through a discharge tube leading to the brush head.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

FIG. 1 is a sectional and face view of a device made according to my invention, with the brush head detached.

FIG. 2 is a section substantially on the line 2-2 of FIG. 1, with the brush head applied.

FIG. 3 is an enlarged sectional view showing a modified form of construction, with the device in the window cleaning use thereof; and

FIG. 4 is a view, similar to FIG. 3, showing the device in a reverse position.

In FIGS. 1 and 2 of the drawing, I have shown one adaptation and use of my invention and, considering FIG. 1, 19 represents the tubular handle member, having a ribbed outer surface, as indicated, in part, at 11 to provide a secure handgrip, the handle member having a threaded cap 12 at its free end in threaded engagement therewith, the cap having a rubber or other washer 13 to seal a liquid, diagrammatically illustrated, in part, at 14, in the bore or reservoir 15 of the handle member. The other end of the handle member is open, as seen at 16, and fitted and secured in this end of the handle member is an elongated tapered tubular body 17, in the end of which is secured a fitting element 18.

In the handle member 10, inwardly of the open end 16, is a transverse pump cylinder 19, in the open end of which is mounted a closure ring 20, in which is supported a finger knob 21 of a piston 22 operating in the cylinder 19. A spring 23 is arranged in the cylinder and engages the piston to normally support the same against the ring 20, as shown in FIG. 1 of the drawing. The cylinder 19 has three radially extending sleeves, one sleeve 24 extending into the open end 16 of the handle member and the other two sleeves 25 and 26 extending into the reservoir 15. The sleeves 24 and 26 have apertures opening into the cylinder 19, which apertures are controlled by spring seated ball valves 27 and 28, respectively. The spring of the valve 27 seats in a multiple diameter coupling tube 29, with which a flexible tube 30 is coupled, the latter extending to and being mounted in the lower portion of the element 18, as clearly noted in FIG. 2 of the drawing, to communicate with a bore 31 in said element, having a discharge 32 into the chamber 33 of a cup-shaped extension 34 of the element. This extension is disposed angularly to the longitudinal plane of the body 17, as clearly noted in FIG. 2 of the drawing. The outer peripheral surface of the extension 34 is bevelled to provide frictional engagement of a brush head 35 therewith, the brush head being in the form of a ring

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having circumferentially arranged bristles 36 thereon, as diagrammatically seen in FIG. 2 of the drawing.

Returning now to the structure of the cylinder 19, it will appear that the spring controlling the ball valve 28 seats on a cap 37 mounted on the sleeve 26. Mounted in the sleeve 25 is a tube 38, which extends to a position adjacent the lower end of the reservoir 15, as seen in FIG. 1 of the drawing, so as to be exposed to substantially all of the liquid 14 in the reservoir and a ball check valve 39 seats on the upper end of the tube 38, so as to prevent discharge of liquid from the cylinder 19 as and when the piston 22 is actuated for discharging liquid from the cylinder up through the tube 30 and into and through the brush head 35 for application to a surface to be cleaned. Considering FIG. 2 of the drawing, it will appear that the cylinder 19 has laterally extending apertured ribs 40 at sides thereof, so that, in filling the device through the cap end 12 with a suitable liquid, the device can be filled to an extent greater than the capacity of the reservoir 15 proper, in that this liquid can pass upwardly through the tubular body 17 and passed downwardly into the reservoir 15, as the liquid is consumed.

In the use of the device, it will be understood that one or two manual strokes of the piston through actuation of the finger knob 21 is essential to draw the liquid 14 from the reservoir into the cylinder 19 and in discharging this liquid from the cylinder up through the tube 30. In this latter operation, the valve 39 is seated. The valve 27 serves to hold liquid in the tube 30 as the device is continuously used so that, in actual practice, in a stroke operation of the piston 22, liquid would be discharged through the head and this discharged liquid would be replaced in the outward stroke of the piston through the medium of the spring 23, which sucks the liquid from the reservoir into the cylinder 19.

The spring actuating the valve 28 will be a very light spring, sufficient to normally maintain the valve in a seated position, but to enable liquid to drain from the cylinder when the device is not in use and positioned or stored in the upright position shown in FIG. 1 in providing a discharge from the cylinder 19 and, in some instances, this discharge can be through a tube extending from the cap 37, as indicated by the dot-dash showing at 37' in FIG. 1.

The element 18 has an angularly extending flared tongue 41, shown in section in FIG. 2, and the flare of which is clearly illustrated in FIG. 1. Descriptively speaking, the brush head may be said to be angularly disposed on one side of the body 17; whereas, the tongue is angularly disposed at the opposed side thereof. Mounted on the tongue 41 are a pair of wiper blade holding plates 42 riveted or otherwise fixed together, as seen at 43 in FIG. 1 of the drawing, in securely supporting the plates on the tongue 41 and in gripping a wiper blade 44 in the jaw side portions 45 of the plates, these jaws engaging an enlarged portion 46 on the blade 44, as clearly illustrated in FIG. 2 of the drawing. It will be understood that, after the window or surface has been cleaned by actuation of the brush thereover, the wiper blade can be utilized in removing liquid from the surface, as with other devices of this type and kind. At this time, it is well to mention that, while the device has a definite use as a window cleaner, it can be utilized for cleaning and wiping any type and kind of surface and, further, can be utilized in operation of the device with the brush and wiper end in a raised position with respect to the hand or operator, or in a lowered position.

In some instances, a one unit device can be utilized and sold for two distinct purposes, namely as a device, including the wiper blade or a device in which the wiper blade and its supports are removed and the tongue 14

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would then be used as a scraper blade in uses of the device as a dish cleaner, in which latter use, the liquid 14 can be in the form of a detergent discharged into the brush head, similar to devices, such as shown in Patent Number 2,772,430, granted December 4, 1956.

In devices of the kind referred to above, I have shown a modified adaptation of FIGS. 3 and 4 and, in these figures, 10' represents the handle member, 17' the tubular body, 19' the cylinder, 29' the coupling tube arranged on the sleeve 24'. At 40' are indicated ribs, similar to the ribs 40 of FIG. 2, except that 40' are not apertured. With the structure shown in FIGS. 3 and 4, the sleeves 25 and 26 are omitted and a single sleeve extension 47 is employed, having a bore 48 angular in cross-sectional form and communicating with the cylinder 19'. This angular bore provides passage of fluid into the cylinder when the parts are in the position of FIG. 4. Mounted on 47 is a two-part valve plug 49, comprising the parts 50 and 51 adhesively or otherwise secured together along the parting line 52. Extending from the parting line 52, the part 51 has a tubular valve seat 53 tapered to fit snugly in a socket 54 in the part 50. The part 50 has a corresponding valve seat 55. A ball check valve 56 operatively engages both of these seats 53 and 55, as will appear from a consideration of FIGS. 3 and 4.

In this connection, it is pointed out that most of the reference characters referred to above and which will follow are applied to the showing in FIG. 3 and will not be completely repeated in the showing in FIG. 4.

Communicating with the bore extending from the seat 53 is a port or passage 57, which also passes through the part 50 and opens into the reservoir 15' of the handle member 10'. In like manner, the part 50 has a port 58 extending from the seat 55 and communicates with a pipe or tube 38', which would be similar to the tube 38 of FIG. 1, the latter extending to the lower portion of the reservoir 15'. With the parts in the position shown in FIG. 3, the modified form of device can be used, similarly to the device as shown in FIGS. 1 and 2, the liquid drawn from the reservoir 15' passing into the cylinder 19' through the port 48, this passage being controlled by a ball valve 59, as is indicated by the arrow in FIG. 3 of the drawing.

In the reverse use of the device as noted in FIG. 4, liquid in the reservoir 15' will be positioned in the reservoir around the cylinder 19' and, in operation of the piston in the cylinder 19', this liquid will be drawn into the cylinder through the port 48 in the direction of the arrows of FIG. 4 with the ball 56 in the seated position shown in said figure to prevent discharge through the tube 38'. In this same connection, it will be apparent that, in the use as shown in FIG. 3, the ball 56 seals the discharge through the port 57. In FIG. 3, it will be understood that the liquid positioned in the cylinder 19' is discharged upwardly through 17' to the brush head; whereas, in FIG. 4, the discharge is through the same head, which is then directed downwardly.

In the present showing, no attempt has been made to identify types of materials employed in the various parts in the shading used. The parts could be composed entirely of metal, except, possibly, the tubes as at 30, 38, 38'. However, in certain uses of this device, all of the parts, except the springs and, possibly, some of the ball valves

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and the plates 42, could be composed of plastic material, even to the structure of the wiper blade 44 which, in the present illustration, is indicated as composed of rubber.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the character described comprising a tubular handle member having a removable cap at one end controlling admission to a reservoir in said handle member, a tubular body extending from the other end of said handle member, a fitting element mounted on the end of said tubular body and comprising an angularly extending cup-shaped extension, a brush head detachable from said extension, a flared tongue angularly disposed to said extension, the handle member having a transverse cylinder adjacent and extending completely across the second named end thereof, said cylinder having a one-diameter bore of a length substantially equal to the diameter of said reservoir, a manually operated piston in said cylinder, a spring for actuating the piston in one direction in said cylinder, said cylinder having a valve controlled intake and a valve controlled discharge circumferentially spaced with respect to said intake, a tube coupled with said discharge and said fitting element for transmitting liquid from said cylinder to said cup-shaped extension, and a tube in said reservoir extending from the first named end of the handle member to said valve controlled inlet.

2. A device as defined in claim 1, wherein the inlet and discharge of the cylinder includes extending sleeves in which ball valves operate, and the ball valve of said discharge is spring actuated in one direction.

3. A device as defined in claim 1, wherein said flared tongue includes means supporting a wiper blade in connection therewith.

4. A device as defined in claim 1, wherein said intake comprises a hollow two-part plug fixed to the cylinder and having an inlet thereto, said plug having two ports, one of which opens directly into the reservoir of said handle member and the other communicates with the last named tube.

5. A device as defined in claim 4, wherein said plug includes two aligned valve seats, and one ball valve operatively selectively engaging both of said seats.

6. A device as defined in claim 5, wherein said plug includes another ball valve controlling the inlet to said cylinder.

7. A device as defined in claim 1, wherein the cylinder includes apertured ribs at opposed sides thereof placing the reservoir of the handle member in communication with a chamber in said tubular body.

8. A device as defined in claim 1, wherein said cylinder includes ribs at opposed sides thereof, and said ribs, in combination with said cylinder, sealing one end of the reservoir in said handle member.

9. A device as defined in claim 1, wherein the cylinder includes a valve controlled drain adjacent the piston when said piston is in normal projected position.

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