June 1, 1937. W. H. KLING 2,082,582

WINDOW CLEANER

Filed May 9, 1936

Fig. 1.

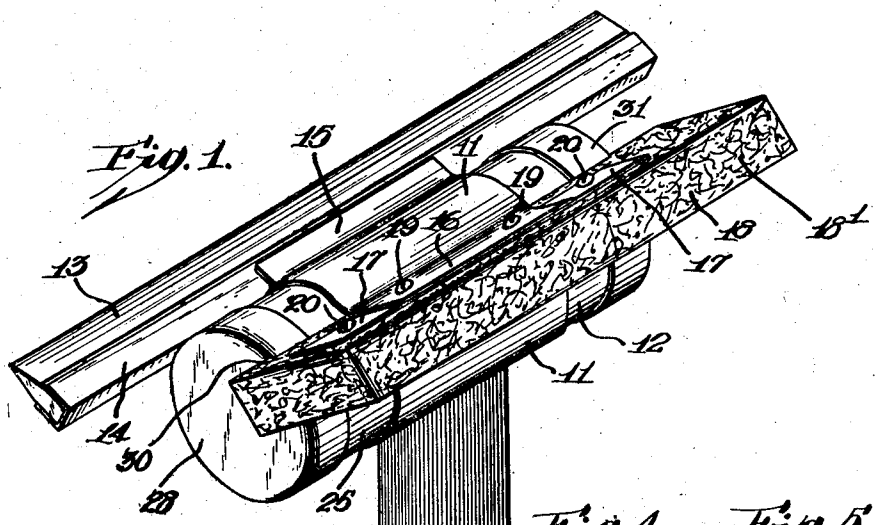


Fig. 2.

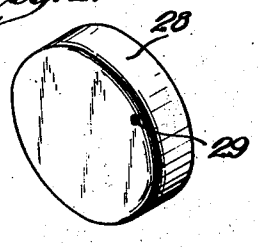


Fig. 3.

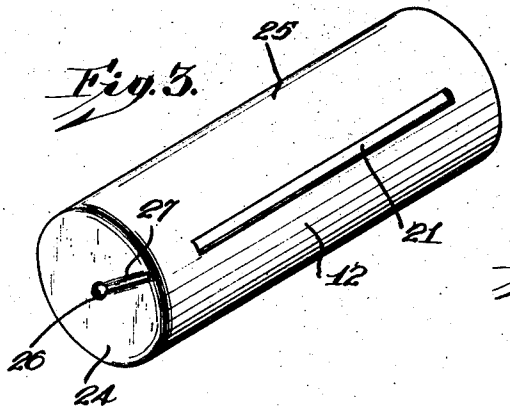


Fig. 4.

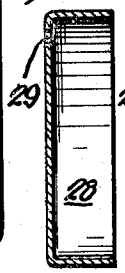


Fig. 5.

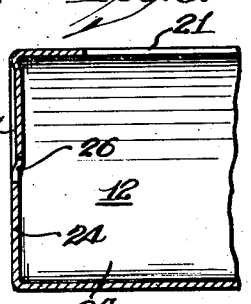
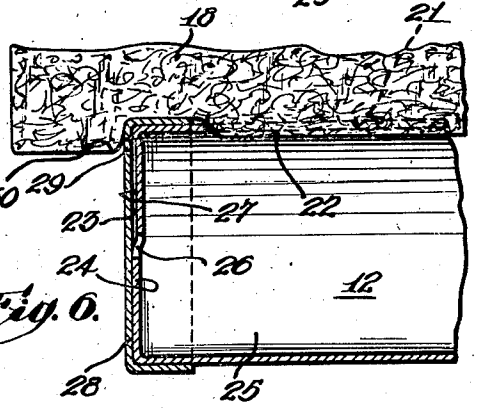


Fig. 6.



Inventor

William H. Kling

by Dewitt Jackson and Sa.

Attorneys.

Witnesses:

Elmer W. Hacker

Walter Kling.

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2,082,582

WINDOW CLEANER

William H. Kling, Merchantville, N. J.

Application May 9, 1936, Serial No. 78,871

5 Claims. (Cl. 15—126)

My invention relates to window cleaners and particularly to window cleaners having wicks for moistening windows.

A purpose of my invention is to prevent the tanks of window cleaners from becoming air-bound.

A further purpose is to supplement the air flow through the wick of a window cleaner by an air inlet which will not allow substantial quantities of cleaning fluid to leak out.

A further purpose is to provide a tank of a window cleaner with a long attenuated air vent passage to prevent leakage of cleaning fluid.

A further purpose is to vent the tank of a window cleaner by an interior port near the center of one end of the tank and exterior port near the edge of the end, the ports being connected by a substantially radial passage through the end wall.

A further purpose is to locate the exterior opening of an air vent in immediate proximity to the wick so that any leakage through the air vent during use of the moistener will simply moisten the wick.

A further purpose is to locate the exterior port of an air vent at the highest point of the tank when the tank is in inoperative position.

A further purpose is to form the ends of a window cleaner tank of separate members, one of which ends is double walled and contains an air vent passage longitudinal of the end.

Further purposes appear in the specification and in the claims.

In the drawing I have chosen to illustrate one only of the many embodiments in which my invention might be shown, choosing a form which is satisfactory in operation and which well illustrates the principles involved.

Figure 1 is a perspective view of my improved window cleaner.

Figure 2 is a perspective view of the cap at the end of the tank at which the air vent is located.

Figure 3 is a perspective view of the tank body.

Figure 4 is a central section of the cap at the air vent end, drawn to enlarged scale.

Figure 5 is a fragmentary central section of the tank body for assembly with the cap of Figure 4.

Figure 6 is a fragmentary section showing the cap and tank body assembled and the wick in place.

In the drawing like numerals refer to like parts.

Figure 1 shows a window cleaner of the type well known in the art, consisting of a handle 10 (which may, if desired, receive a handle extension, not shown) suitably attached to a band 11, which in turn surrounds a cleaning fluid tank 12 and supports a squeegee 13 of rubber or suitable material, held in a channel member 14 by a clamp 15 suitably attached to the band 11.

The ends of the band 11 are bent outwardly at 16 to engage on the respective sides of clamping plates 17 which support the faces of a wick 18. One end 16 of the band 11 and one clamping plate 17 held by this end 16 are hidden by the wick in Figure 1. The ends 16 of the band 11 are held by bolts 19. Additional bolts 20 are provided to draw together the ends of the clamping plates.

The tank 12 has a discharge opening desirably in the form of a slot at 21 and the slot registers with the wick 18 so that cleaning fluid escaping through the slot 21 will be taken up by the wick and maintain the wick in moist condition. By regulating the tightness of the bolts 19 and 20, the rate of feed of the cleaning fluid from the tank to the wick can be adjusted rapidly. Depending upon the pressure, the wick 18 may in certain instances be forced well into the slot, as shown at 22 in Figure 6.

The parts above described are generally well known in devices of this kind.

In using the window cleaner just described, it has been customary to soak the wick in a pan of water for a suitable time, desirably a few minutes, and then to squeeze out the excess water from the wick. The tank has then been filled with a suitable cleaning fluid, which may be water, or preferably water containing a little vinegar, suitably in the proportions of about one teaspoonful of vinegar to about a half-pint of water.

The wick is then ordinarily tapped several times on a flat surface to press it firmly against the slot in the tank. The wick is now ready to moisten the windows, after which they are dried by the squeegee used in the conventional manner.

While moistening the windows, the clamping plates 17 are substantially horizontal with the wick surface 18' against the window and the slot at the side of the tank. The cleaning fluid in the tank gyrates and surges constantly, maintaining the portion of the wick in contact with the interior of the tank in a moist condition. As cleaning fluid is drawn outwardly through the wick and deposited upon the window at the surface 18' of the wick, it is necessary for air to flow into the tank to prevent the tank from becoming air-bound and causing the wick to remain dry.

The felt of the wick is surprisingly impervious

to air, particularly when wet. After the initial moisture contact imparted to the wick prior to use is exhausted, difficulty is encountered with the moistener because of the tendency to become air-bound. Thus, after a period of use, it has been found necessary to moisten the wick by dipping it in water in order to restore its efficiency. An air vent of the conventional type cannot be used because it will permit leakage and loss of cleaning fluid and possible damage to furniture, etc., on which the window cleaner is placed when not in use.

I have discovered that the window cleaner will function continuously providing an air inlet of the type invented by me is used, and that the disadvantages of leakage, wastage of fluid and damage to objects on which the window cleaner is placed can be avoided.

I prevent the leakage of cleaning fluid by using a long attenuated air escape passage **23** which is formed in the double wall of the tank **12**. As shown in Figure 3, the integral end wall **24** of the tank body **25** is pierced by a port **26** opening into the interior of the tank and also dented to form a channel-like depression **27** extending radially of the end wall. The cap **28** is provided with a small port **29** which cooperates with the radially outer end of the passage **23** when the cap **28** is in position on the end of the tank body, as shown in Figure 6.

In order for air to enter the tank to take the place of cleaning fluid which has been drawn out by the wick **18** and applied to the glass being operated upon, the air must flow through the outside port **29**, the attenuated passage **23** and the inside port **26**. Cleaning fluid in order to escape through the air vent must flow in the reverse direction through the inside port **26**, the attenuated passage **23** and the outside port **29**. Since the frictional resistance of the air vent to the flow of the liquid cleaning fluid is very much greater than the frictional resistance to the flow of the gaseous air, air enters the vent very much more readily than cleaning fluid escapes, and the escape of cleaning fluid during the normal use of the window cleaner is prevented.

It is desirable that the vent offer considerable fluid friction and therefore some attention should be paid to the dimensions of the ports and passage. These are of course subject to change with the size of the tank, but for a tank holding somewhat less than a half pint, I find that the air vent works satisfactorily when the outside port **29** is approximately $\frac{1}{32}$ inch in diameter, the depression forming the attenuated passage **23** approximately $\frac{1}{32}$ inch in width and roughly of half-round cross section, and the inside port **26** as large as $\frac{1}{8}$ inch in diameter. The attenuated passage **23** in the preferred embodiment is more than $\frac{1}{2}$ inch long.

I also find that it is very desirable to locate the outside port **29** in juxtaposition to the wick so that any fluid leakage which may nevertheless take place will not result in wastage of cleaning fluid but will simply serve to moisten the wick. This involves placing the port **29** near the circumference and in the same circumferential position as the discharge opening **21**. It will be noted that in Figure 6 the wick portion **30** is in close proximity to the outside port **29**, so close in fact that minute hairs or threads (not shown) of the felt or other wick material touch with edges of the port, but the felt is not pressed into the port nor against the port and therefore does not impede the flow of air. It will be evident that as the moistener is used, any possible leakage of cleaning fluid out through the air vent (although ordinarily none will occur) will be picked up by the hairs or threads of the wick and distributed through the wick, and particularly to the operative surface **18'** of the wick. This is not only a saving of cleaning fluid in case leakage should occur but avoids possible drip which would be damaging to woodwork, hangings, rugs and floors. The portion **30** of the wick also protects the air port from clogging with dust or dirt.

In no case does the tank become air-bound, as the air vent supplements the flow of air through the wick itself to the slot **21**.

The location of the long attenuated air passage in what is effectively a double end wall of the tank is quite advantageous as this construction is simple to manufacture and avoids the use of a tube projecting from or into the tank and likely to become detached.

It will be understood that the interior communication between the air vent and the tank should be at a point which communicates with the air in the tank. Unfortunately, the position of the tank during use varies with different users and a location of the inside port **26** around the edge is likely to be satisfactory for one user and unsatisfactory for another. It is therefore preferable to locate the inside port **26** at the center and this proves satisfactory because with the gyration and churning of the fluid during use of the moistener, the inside port **26** is frequently in communication with air inside the tank.

The location of the outside port **29** is important also from the standpoint of preventing leakage from the tank when the window cleaner is not in use. At such times, the cleaner will normally rest upon the squeegee **13** and the end of the handle **10**, with the discharge opening and wick up to prevent the wick from drawing out cleaning fluid from the tank. The position of the tank and wick when inoperative as just explained is generally indicated in vertical section by Figure 6. The outside port **29**, being at a high point on the tank in this position, will prevent leakage of cleaning fluid from the tank.

The end of the tank opposite from the air vent is provided with a suitable cap **31** having a stoppered opening, not shown. The tank may be desirably constructed from parts extruded or drawn from aluminum or the like. It has been found preferable to use an extruded tubular body **25** having an integral end wall **24**, and drawn caps **28** and **31**.

It will of course be understood that various changes may be made in the material and in the constructional features without departing from the substance of the invention.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the structure shown and I therefore claim all such in so far as they fall within the reasonable spirit and scope of my invention.

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

1. In a window cleaner, a tank having a discharge opening, a wick outside the tank and engaging the walls of the discharge opening and walls forming an air vent communicating from the interior of the tank to the outside air, con-

stantly open to the outside air and including walls forming a long attenuated passage of uniformly small diameter.

2. In a window cleaner, a tank having a discharge opening, a wick outside the tank and engaging the edges of the discharge opening and walls forming an air vent communicating from the interior of the tank to the outside air and having a port at its outside end in juxtaposition to the wick, whereby cleaning fluid escaping through the air vent will be taken up by the wick.

3. In a window cleaner, a tank including a tank body having integral side and end walls and an open end, caps upon each end, thereby forming a double wall at one end, walls forming an inner port through the integral end wall into the space between the integral end wall and the cap at that end, walls forming an outer port through the cap and into the space between the cap and the integral end wall, walls forming a passage between the cap and the integral end wall and connecting the ports, walls forming a discharge opening from the tank and a wick cooperating with the discharge opening.

4. In a window cleaner, a tubular tank consisting of a tank body having side and end walls and an open end, caps upon each end, thereby forming a double wall at one end, walls forming an inner air vent port through about the center of the end wall of the tank body into the space between said end wall and the adjacent cap, walls forming an outer air vent port through the cap near its edge and into the space between the cap and said end wall, walls forming an air vent passage between the cap and said end wall and connecting the ports, walls forming a discharge opening through the side wall of the tank body and at a circumferential position corresponding to the outer port and a wick extending across the discharge opening and around the end of the cap into close proximity with the outer port.

5. In a window cleaner, a generally cylindrical tank having a lateral discharge opening extending generally lengthwise of one side, a wick secured outside of and in contact with the walls of the discharge opening, walls forming an air vent extending generally radially of the end and communicating with the atmosphere through a port near the circumference positioned around the circumference to correspond with the discharge opening and means to support the tank with the discharge opening and port near the top of the tank, whereby when the window cleaner is not in use, leakage through the discharge opening and through the air vent is alike prevented.

WILLIAM H. KLING.