

UNITED STATES PATENT OFFICE

2,446,401

WINDOW CLEANER

Samuel Ziskind, New York, N. Y., assignor to
Safeway Specialty Corporation, New York,
N. Y., a corporation of New York

Application May 10, 1946, Serial No. 668,885

3 Claims. (Cl. 15-121)

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My invention relates to window cleaning devices and has particular reference to portable manually operable devices for cleaning the outside panes of the windows.

The main object of my invention is to provide a window cleaning device which can be conveniently used for washing and wiping outer surfaces of window glass panes by an operator standing near the window inside the house or inside the room whose windows are being cleaned. With my device it is not necessary, therefore, to lean out or sit out of the window for cleaning the outer sides of the glass panes, and the operator can remain in perfect safety inside the room.

In my copending patent application, Serial No. 611,300, filed August 18, 1945 and which became abandoned Apr. 7, 1948, I disclosed a device for cleaning windows in which the cleaning elements such as felt and rubber strips were permanently fastened to their holder. In my present invention, I provide improved means for replaceably supporting the cleaning elements in a suitable holder without the use of any screws, bolts, or similar fasteners.

Another object of my invention is to provide a device of a simplified, inexpensive, and reliable construction by making its principal parts, such as a holder for the cleaning elements and the articulated portions of the supporting arm of an extruded material of corresponding shapes, preferably of material suitable for such process, as for instance, aluminum, magnesium or of a suitable plastic composition.

Another object of my invention is to provide a window cleaning device of a general type indicated above in which the cleaning elements with their holder can be turned on a supporting arm into a desired position without removing any bolts, screws or similar fastening means, and the holder will be yieldably retained in its adjusted position.

Still another object of my invention is to provide means to use rubber wipers in my device of a type available on the market, and now used for windshield wipers on automobiles.

My invention is more fully described in the accompanying specification and drawings in which:

Fig. 1 is an elevational view of my window cleaning device showing the same in an operative position for cleaning the outer side of a window pane;

Fig. 2 is a fractional view of the device on an enlarged scale showing the holder with cleaning elements attached to the end of the supporting bar;

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Fig. 3 is a bottom plan view of the same;

Fig. 4 is a fractional detailed view of a bar and holder;

Fig. 5 is a detailed side view of the articulated joint between the portions of the supporting arm;

Fig. 6 is an edge view of the same;

Fig. 7 is an end view of the bar showing the connecting piece;

Fig. 8 is a side view of a modified device employing a supporting arm made of a single bar bent at an angle; and

Fig. 9 is a view of another modification in which a single straight bar is employed for the arm.

My window cleaning device comprises a holder generally designated 1 which may be made of metal, plastic composition or similar material, in the form of a plate having a flat central portion 2 and angular or inclined side portions 3 and 4. The portion 3 is provided with an angular extension 5 forming a rectangular seat or groove for a piece of felt or sponge 6. The outer edges of the portion 3 and extension 5 are bent inward at 7 for retaining the felt 6 firmly in its place in the groove. The ends of the edges 7 may be rounded to facilitate insertion of the felt by sliding the same into the groove from the end of the holder. The angular extension 5 may be made separately and secured to the holder 1 as by welding or riveting, but in a preferred construction it is formed integrally with the body of the plate 1 as by extrusion in the form of a continuous strip which is subsequently cut into pieces of a desired length.

The other side portion 4 is similarly provided with an integrally formed extension 10 forming a round groove or seat for the head 11 of a wiper strip 12 preferably made of rubber or similar material. The outer edge of the portion 4 is tapered outward at 13 for supporting the strip 12 during operation of the device.

The central portion 2 of the holder is provided with a central hole for a bolt 14 which fastens the holder to the end portion of an arm generally designated 2' and comprising articulated bars 15, 16 pivotally connected together by a bolt 17. The bars 15, 16 are preferably of a rectangular tubular shape made of metal, plastic composition or similar material, preferably by extrusion, being hollow inside to reduce their weight and cost. The bar 15 is placed edgewise against the outer side of the portion 2 of the holder by the bolt 14 which may be of a type known as "carriage" bolt, having a rectangular portion 17' under its head for preventing rotation of the bolt in the bar 15. The bolt is tightened in its place by a nut 18, lock nut 19 and a spring washer 20. Thus the holder 1 can

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be turned in a desired position without the necessity of releasing the nuts 18, 19 and will remain in the adjusted position by friction of the spring washer. I have found that it is preferred to use the holder when it is placed at right angles to the bar 15 as shown in Fig. 1 with either felt or rubber wiper at the top for cleaning a window pane 21. To center the holder in this position, the outer surface of the central portion 2 may be provided with a transverse concave groove 22 engaging the convex edge of the bar 15 as shown more clearly in Fig. 4. Thus the holder is firmly held in a position at right angles to the bar 15 but can be turned for reversing the positions of the felt and rubber by applying sufficient force to overcome the resistance of the spring washer 20. A longitudinally extending groove 22' may also be provided for retaining the holder in a vertical position.

The articulated joint between the bars 15 and 16 is formed with end pieces 23, 24 fitted in the ends of the bars 15, 16 and secured as by rivets 25. The abutting surfaces of the end pieces are provided with interlocking teeth or serrations 26 and with holes for the bolt 17 tightened by a wing nut 27. The bars 15, 16 can be placed at any desired angle to each other and locked in this position by tightening the nut 27. The end bar 16 is provided with a handle 28, preferably of rubber or similar material.

A modified device is shown in Fig. 8 in which the holder 1 is supported on an arm 30 made of a single piece and bent in the middle at a desired angle.

Another modification is shown in Fig. 9 in which the holder 1 is supported on a straight arm 31.

It will be understood that various features and principles of each of the embodiments of the invention above described or referred to may be utilized or substituted in the other embodiments.

While the invention has been described in detail with respect to certain particular preferred examples, it will be understood by those skilled in the art after understanding the invention, that various changes and further modifications may be made without departing from the spirit and scope of the invention, and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. A window cleaning device comprising a holder formed of a generally rectangular shape, said holder having an intermediate portion and inclined sides extending therefrom, with longitudinally extending slots in the two opposite free edges of said sides for carrying cleaning elements in the form of strips, said intermediate portion having an opening therethrough; an arm having a handle at one end and a transverse opening adjacent the other end thereof for registry with said opening through the intermediate portion, whereby said intermediate portion and a longitudinal portion of the arm adjacent the other end are adapted to be connected in parallel relationship, one of said sides forming an acute angle

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with said longitudinal portion; and means to rotatably and adjustably attach the holder to the other end of the arm.

2. A window cleaning device comprising a holder of a generally rectangular shape, formed with an intermediate portion and inclined sides extending therefrom with longitudinally extending slots in the two opposite free edges of said sides for carrying cleaning elements in the form of strips, said intermediate portion having an opening therethrough; an arm having a handle at one end and a transverse opening adjacent the other end thereof for registry with said opening through the intermediate portion, whereby said intermediate portion and a longitudinal portion of the arm adjacent the other end are adapted to be connected in parallel relationship, one of said sides forming an acute angle with said longitudinal portion; and means to rotatably and adjustably attach the holder to the other end of the arm, the arm consisting of two bars pivotally connected together, and the bars having interlocking serrations at their pivotal connection.

3. A window cleaning device comprising a holder of a generally rectangular plate having longitudinally extending slots in its two opposite edges; cleaning elements in the form of strips adapted for disposition in said slots, said strips being frictionally secured in said slots; said plate having a substantially flat central portion and side portions, said side portions being formed at inclinations with said central portion, said longitudinally extending slots being disposed in the two opposite edges of said inclined side portions; an arm having a handle at one end; and means for rotatably and adjustably attaching the flat central portion adjacent the other end of the arm, said flat central portion and said other end of the arm being connected in parallel alignment.

SAMUEL ZISKIND.

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