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VEHICLE WINDSCREEN WASHERS

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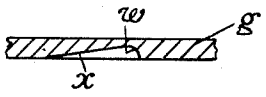


Fig. 1a

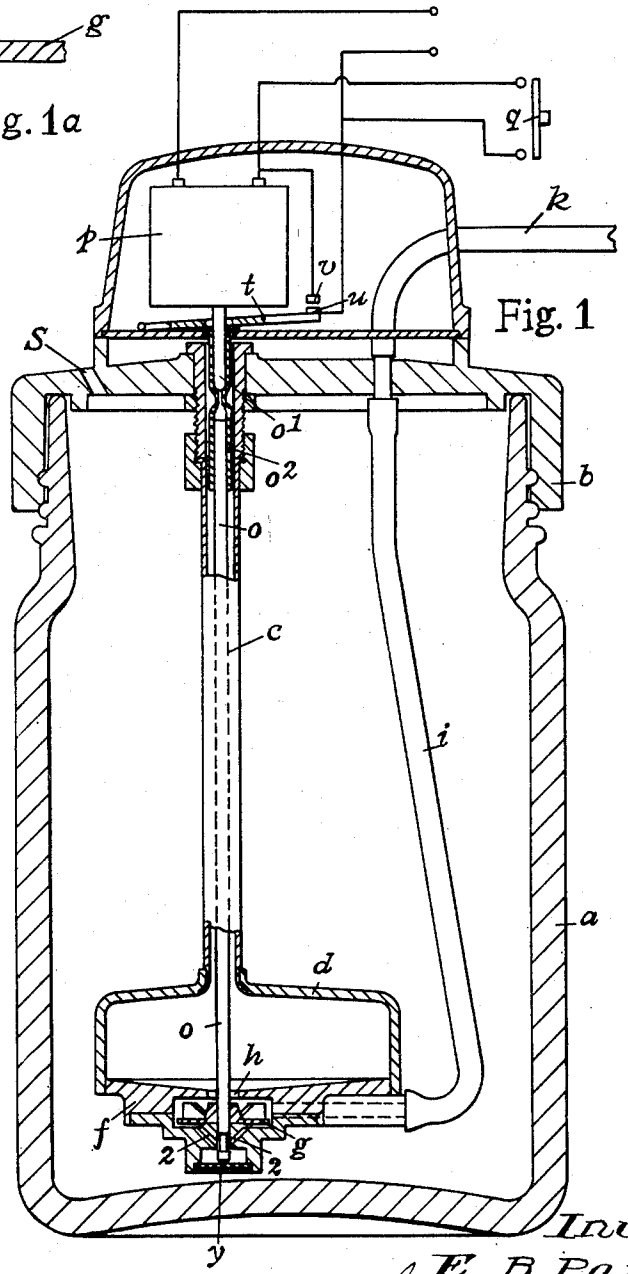


Fig. 1

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VEHICLE WINDSCREEN WASHERS

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1 Claim. (Cl. 222—63)

This invention relates to vehicle windscreen washers adapted to project a jet of water or other cleansing liquid on to the area of the windscreen swept by the windscreen wiper.

The object of the invention is to provide in a simple and convenient form an apparatus adapted to project a predetermined quantity of liquid in each actuation of the apparatus.

In general an apparatus embodying the invention comprises in combination a liquid storage vessel, a measuring chamber arranged in the lower part of the storage vessel to receive liquid therefrom, a rotary pump of the centrifugal type mounted in direct association with the lower part of the measuring chamber for discharging liquid from the latter, the pump having a rotary impeller capable of axial movements, closure means at the upper end of the storage vessel, suspensory means through the medium of which the measuring chamber and pump are carried by the closure means, an electric driving motor mounted on the closure means and operatively connected to the pump, a manually operable switch for starting the motor, and a second switch responsive to axial movements of the pump impeller for maintaining the motor in action and bringing it to rest.

In the accompanying drawings:

Figure 1 is a sectional side elevation illustrating one form of washing apparatus embodying the invention, whilst Figure 1*a* is a fragmentary view illustrating a detail of the pump.

Referring to the drawings, the example thereshown comprises a bottle *a* which serves as a reservoir for water or other cleansing liquid. The bottle is detachably secured to a cap *b* which may be adapted to be mounted by means of a bracket or otherwise in the engine bonnet of the vehicle or other convenient position. The cap serves also as the supporting means for the pump measuring chamber, and a motor for driving the pump. In this example, there is secured to the cap a depending tube *c* to the lower end of which is attached the measuring chamber *d*, which is supplied with liquid from the bottle in the manner hereinafter described. The lower part of the measuring chamber forms the housing *f* of a small centrifugal pump, the impeller of which is indicated by *g*. Water can flow freely into the pump housing from the chamber *d* through an aperture *h*, and the water is discharged from the pump housing under the action of the impeller through a flexible tube *i* which latter is connected by another flexible tube *k* to a nozzle (not shown) through which the water is discharged on to the windscreen of the vehicle.

The pump impeller is secured to a driving spindle *o*, *o'* extending along the tube *c* to a small electric motor *p* mounted on the cap *b*. The motor circuit is controlled by a manually operable push-button switch *q*, and also by a second switch having a movable member *t*.

The driving spindle consists of two coaxial parts *o*, o^1, interconnected by a sleeve o^2. Also the spindle and pump impeller have a restricted axial freedom of movement, so that by upward movement of the spindle under the thrust exerted on it by the impeller, the part o^1 of the spindle can actuate the movable switch member *t* for maintaining the motor in action after the hand switch *q* has been released. The said member *t* is hinged at one end and at the other end it is provided with a contact piece *u*, which co-operates with a fixed contact *v*.

The adaption of the pump impeller to exert an upward thrust on the spindle may be effected in a variety of ways. In the example shown, the underside of the impeller has formed in it a plurality of substantially radial grooves *w* (Figure 1*a*) each of which is flanked by an inclined surface *x*, the upward thrust being obtained by the interaction of the said surface with the adjacent liquid when the impeller is rotated in the appropriate direction. Further, the measuring chamber *d* is supplied with liquid from the bottle *a* through the pump body part, and the entrance of liquid to the pump body part is controlled by the lower end of the spindle *o* which is adapted to act as a piston valve. When the pump is at rest, a groove around the spindle exposes passages **2** in the pump body and allows liquid to flow through a filter gauze *y* to the pump and thence to the measuring chamber *d*. When it is required to discharge the contents of the measuring chamber on to the windscreen, the hand switch *q* is closed temporarily to start the motor and pump. Upon the pump being started, its impeller *g* moves upwards sufficiently to cause the lower end of the spindle part *o* to close the passages **2**. This upward movement of the impeller also causes the spindle part o^1 to move the switch member *t* for closing the switch contacts *u*, *v*, and thereby maintaining the action of the motor and pump after the hand switch *q* re-opens. Discharge of water from the measuring chamber by the pump through the flexible tubes *i*, *k* now continues until the measuring chamber has been emptied. The spindle *o*, o^1 then resumes its initial lower position, causing the switch member *t* to re-open the contacts *u*, *v*, and thereby bring the motor and pump to rest. The admission of air to the measuring chamber is effected through the tube *c* which is open at its upper end. Admission of air to the bottle is effected through an orifice *s* in the cap *b*. Refilling of the measuring chamber when the pump is at rest is effected through the passages **2**.

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

A vehicle windscreen washer comprising in combination a liquid storage vessel, a measuring chamber arranged in the lower part of the storage vessel to receive liquid therefrom, a rotary pump of the centrifugal type mounted in direct association with the lower part of the measuring chamber for discharging liquid from the latter, the pump having a rotary impeller capable of axial movements, closure means at the upper end of the storage vessel, suspensory means through the medium of which the measuring chamber and pump are carried by the closure means, an electric driving motor mounted on the closure means and operatively connected to the pump, a manually operable switch for starting the motor, and a second switch responsive to axial movements of the pump impeller for maintaining the motor in action and bringing it to rest.

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