

- [54] **AEROSOL VALVES**
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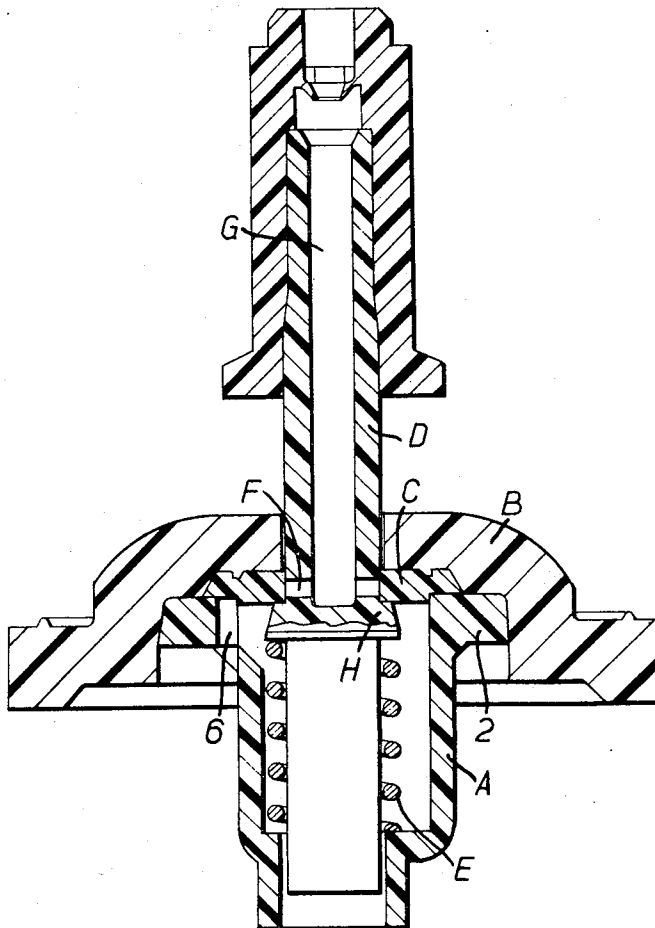
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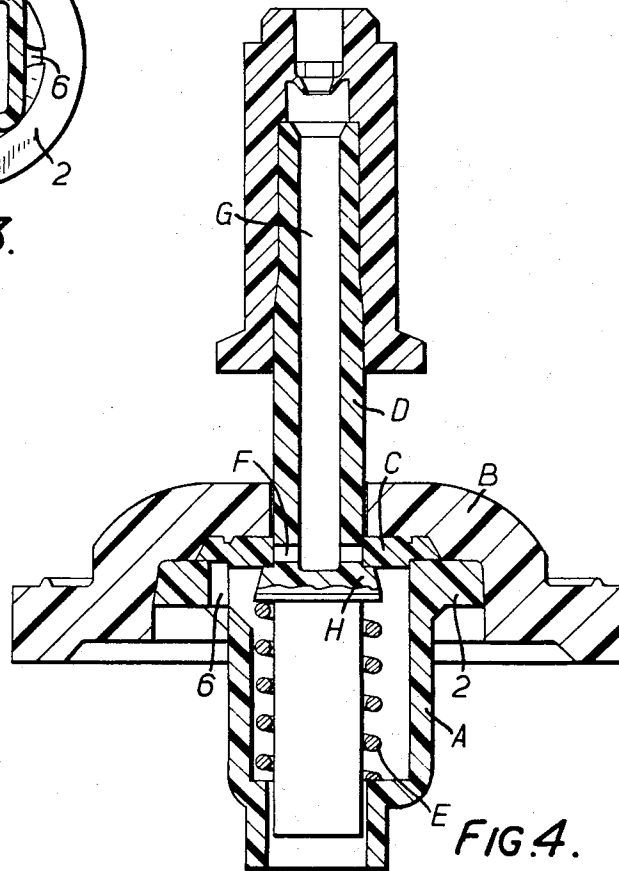
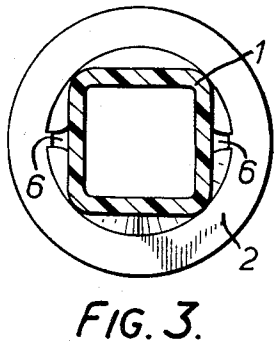
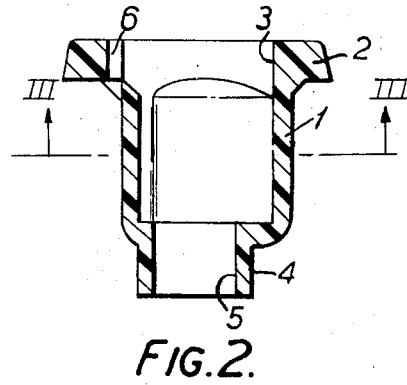
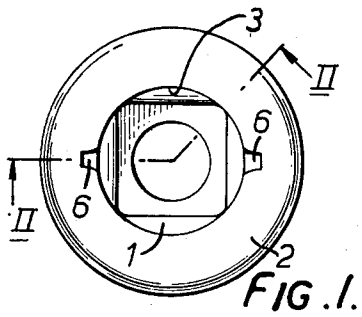
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[57] **ABSTRACT**  
 A moulded valve cup for an aerosol valve assembly which includes means for connecting the interior of the cup to the exterior thereof, the means comprising a flange at the upper end of the cup, a counter bore within the cup substantially equal to the thickness of the flange and an aperture extending through the flange in a direction parallel with the main axis of the cup and opening radially inwardly to the periphery of the counterbore over the full thickness of the flange. This construction avoids moulding problems of the prior art wherein the apertures are formed by separate movable pins in the moulding tool, which are expensive and are prone to leave vestigial flashes at their junction with a central core pin.

**2 Claims, 4 Drawing Figures**





INVENTOR

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## AEROSOL VALVES

The invention relates to valve assemblies for pressurised dispensing containers.

More specifically, the invention relates to valve assemblies for pressurised dispensing containers comprising a moulded valve cup secured at its open outer end to a closure member or ferrule, a valve member having a discharge passage and extending in sealed relation through the closure member into the interior of the cup, a valve spring in the cup biasing the valve member outwardly to a normal closed position in which the discharge passage is isolated from the interior of the cup, the valve member being movable against the action of the spring to connect the discharge passage with the interior of the cup and at least one aperture in the side wall of the cup to provide communication between the interior of the cup and the interior of a container upon which the valve assembly is mounted in use. Such valve assemblies are hereinafter referred to for convenience as being "of the class specified."

The above mentioned side-wall aperture or apertures may, in some cases, provide the only means of communication, or they may supplement a bottom opening in the valve cup. They may serve, for example, as vapour phase taps to ensure the mixing in the valve cup of vapour phase and liquid phase propellant, or as a means of ensuring substantially complete liquid exhaustion of an aerosol package for use in an inverted position.

The injection moulding of valve cups with side apertures presents a number of manufacturing difficulties which present considerable problems in the mass production of low-cost units. Such side apertures are commonly formed by separate, movable pins in the moulding tool, resulting in relatively high cost tools and difficulties in maintaining repetitive production to a sufficiently high degree of accuracy. In particular, vestigial flashes frequently occur at the junction of the side pins and the central core pin which they abut.

The present invention, however, provides a novel design of valve cup with one or more side apertures, designed to permit its production by injection moulding in a manner which avoids the disadvantage inherent in using moulding tools having movable side pins.

The invention accordingly provides a moulded valve cup having a flange at its open outer end and at least one aperture extending through the flange in a direction parallel with the main axis of the cup, the outer part of the aperture communicating laterally with the interior of the valve cup in the region of the flange whereby to place the exterior and interior of the valve cup in direct communication with each other.

One form of valve cup in accordance with the invention is described below, by way of example only, with reference to the accompanying drawings, in which:

FIG. 1 is a top plan view of the valve cup;

FIG. 2 is a section on the line II—II of FIG. 1;

FIG. 3 is a section on the line III—III of FIG. 2; and

FIG. 4 is a sectional elevation of a valve assembly incorporating the valve cup of FIGS. 1 - 3.

The valve cup has a main side wall 1 of generally square cross-section and a flange 2 at its upper end encompassing a circular counterbore 3 which merges with square bore beneath it. The diameter of the coun-

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terbore corresponds substantially to the diagonal of the square bore and its axial depth is substantially equal to that of the flange 2. The lower, inner end of the valve cup has a reduced diameter neck portion 4 the bore of which forms a bottom outlet 5.

A pair of diametrically opposed side apertures 6 are formed through the flange 2 and in a direction parallel with the main axis of the cup, and the outer part of each aperture communicates laterally with the interior of the cup (in the region of the flange 2 and counterbore 3) and the exterior of the cup immediately beneath the flange 2, whereby to put the exterior of the cup, beneath the flange, and the interior of the cup in communication with each other.

These apertures can therefore be formed by core pin portions which move parallel with the axis of the main core pin and are preferably formed as projections on the side of the main core pin.

Furthermore, the tool is preferably designed to have its main parting line in the plane of the lower surface of the flange 2, so that the butting-off faces for the core-pin projections are in this plane, and perpendicular to the direction of parting of the mould parts.

When, inevitably, wear of these butting-off faces takes place, resulting in vestigial flashing, it is readily and simply rectified by a simple grinding of the tool face on the parting line.

FIG. 4 shows a valve assembly incorporating the cup A, the flange 2 of which is sealingly secured in a closure member or ferrule B, in clamping engagement with a seal C. A movable valve member in the form of a valve stem D extends outwardly through the seal and ferrule, being biased outwardly by a valve spring E whose inner end is supported in the cup A. The stem is formed with side apertures F leading to an axial discharge passage G, and the valve is normally closed by engagement of a sealing collar H pressed by the spring E into tight engagement with the inner surface of seal C.

This particular valve is intended to operate in the inverted position, so that liquid enters the interior of the cup A through the bottom opening 5 and the side apertures 6. Inward movement of the valve stem D exposes the aperture F to the interior of the cup A, and the contents of the container are discharged through the passage G in known manner.

I claim:

1. A moulded valve cup for an aerosol valve assembly, comprising a tubular side wall defining an interior cavity, an outwardly projecting flange at the outer end of said wall, means defining a counterbore to said internal cavity said counterbore having an axial depth substantially equal to the thickness of said flange, and means defining at least one aperture extending through said flange in a direction parallel with the main axis of the cup and opening radially inwardly to the periphery of said counterbore over the full thickness of said flange.

2. A valve cup in accordance with claim 1, wherein the main side wall of the cup is substantially square cross section, and the flange and counterbore are circular, the diameter of the counterbore corresponding substantially to the diagonal of the interior of the main side wall of the cup.

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