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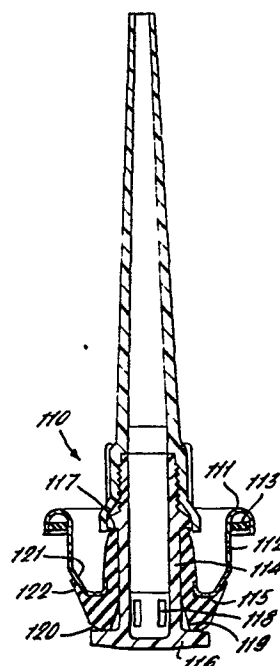
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Improvements in valves for dispensers.

A valve of the tilt opening type for pressurised dispensing containers comprises a mounting cap (112) having a cylindrical portion and a frusto-conical portion. A valve stem (114) extending through the valve cup has a surrounding sealing sleeve (115) which includes a frusto-conical skirt portion (112) which surrounds the corresponding portion of the valve cup. The valve is opened by tilting the valve stem thereby unsealing apertures (118) in the valve stem and the shape of the sealing sleeve prevents it lifting off from the mounting cup.

FIG. 2.



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IMPROVEMENTS IN VALVES FOR DISPENSERS

The present invention relates to a valve for a
pressurised dispensing container, the valve comprising
10 a valve cup for securing to the container, a valve
stem extending through an aperture in the valve cup
and having a valve head and a shoulder spaced from the valve
head, ports being provided in the valve stem adjacent
the valve head, and a resilient sealing sleeve
15 surrounding the valve stem and being located between
the valve head and the shoulder. A valve such as this
will hereinafter be referred to as "a valve of the
type defined".

A problem that is encountered with a valve of
20 the type defined is that the sealing sleeve tends to
move with the valve stem because it is gripped to the
stem by the pack pressure. This has the effect of
lifting the sealing sleeve off the mounting cup
creating a tendency for the valve to leak rather
25 than open as intended. As a result known valves tend
either to be very difficult to open, particularly at
high pressure, or to open with a snap-action, which is
undesirable.

It is known from British Patent Specification No.1047792 to provide a tapered counterbore in the sealing sleeve of the valve in an attempt to facilitate the tilting action of the valve stem. It is also known
5 to provide a chamfered end to the sealing member adjacent the head of the valve stem in an attempt to facilitate the tilting action of the valve stem further. However, the problem of the sealing sleeve tending to lift off the mounting cup, causing the valve to leak, still remains.

10 Accordingly, the present invention provides a valve of the type defined in which the valve cup comprises a generally cylindrical portion and a frusto-conical portion, the aperture being provided in the smaller end of the frusto-conical portion, and the sealing sleeve includes
15 a frusto-conical skirt portion extending around said frusto-conical portion of the valve cup.

The sealing sleeve preferably has a counter-bore surrounding the valve stem at its end adjacent the valve head to facilitate tilting of the valve
20 stem.

The sealing sleeve is preferably externally chamfered at its end adjacent the valve head to facilitate tilting of the valve stem.

The sealing sleeve may include an integral, generally cylindrical skirt portion extending around
25 said generally cylindrical portion of the valve cup.

The sealing sleeve may further include an integral, generally cylindrical skirt portion extending around said generally cylindrical portion of the valve cup and an integral gasket ring.

5 The invention also provides a pressurised dispensing container having a valve according to the invention.

By way of example, an embodiment of the present invention, together with modifications thereto, will now be described with reference to the accompanying drawings,
10 in which:-

Figure 1 is a sectional view of a prior art tilt-opening valve,

Figure 2 is a sectional view of an embodiment
15 of a valve according to the invention.

Figure 3 is a sectional view of a modified form of the valve of Figure 2, and

Figure 4 is a sectional view of a further modified form of the valve of Figure 2.

20 A tilt-opening valve 10 of a kind known to the art is shown in Figure 1. The valve 10 forms the end closure of a conventional pressurised dispensing container and is attachable thereto by crimping an annular collar 11 which is incorporated into metal mounting cup 12 of the valve. There is a suitable gasket ring 13 to
25 ensure a fluid tight seal for the container. A rigid valve stem 14 and an annular sealing sleeve 15 of rubber-like material extend through a central aperture in the mounting cup 12. The valve stem 14 has a flanged

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head 16 at one end and an opposing shoulder 17 towards
the other end. The valve stem 14 is open for dispensing
fluid at its shouldered end and closed at the other
5 end except for a number of ports 18. The sealing
sleeve 15 is located on the valve stem 14 between the
head 16 and shoulder 17. When the valve stem 15 is in
its normal, axially-aligned position, as shown in Figure 1,
the head 16 seats against the sealing sleeve 15 to seal off
10 fluid in the container. When the valve stem 17 is tilted
relative to the axis of the container, one region of the
head 16 lifts off its seat on the sealing sleeve 15 allowing
fluid to flow under pressure through ports 18 to be
dispensed out of the open end of the valve stem.

15 A problem with tilt-opening valves arises in
providing the valve with an easy, well-controlled tilting
action for dispensing fluid whilst ensuring that an adequate
seal is maintained. To this end, the valve 10 known to the
art and shown in Figure 1 incorporates a tapered counterbore
19 in the end of sealing sleeve 15 adjacent head 16 to
20 facilitate tilting of the valve stem 14. As a further
aid, the same end of the sealing sleeve 15 incorporates
an external chamfer 20. A problem still remains, however,
in that the sealing sleeve 15 will tend to move with
the valve stem 14 when it is tilted, particularly at high
25 internal pressures. This will have the effect of lifting
the sealing sleeve 15 off the mounting cup 12, creating
a tendency for the valve to leak. Until now, therefore valves

have tended to be either very difficult to open, particularly at high pressures, or have opened with an undesirable snap-action.

5 A valve 110 according to the present invention is shown in Figure 2 (one hundred has been added to the numerals which designate those features of the valve 110 corresponding with those known in the art.)

10 In the valve 110 of Figure 2, the mounting cup 112 is extended by an additional frusto-conical portion 121 at one end thereof, and the sealing sleeve 115 has a complementary frusto-conical skirt 112 which is designed to extend around the portion 121 of the mounting cup. Because of the additional surface area which the skirt 15 122 of the sealing sleeve 115 presents, the sealing sleeve will be held against the mounting cup 112, by virtue of the fluid pressure, with a greater force than before. This will reduce the tendency for the sealing sleeve 115 to lift off the mounting cup 112 when the 20 valve stem 114 is tilted. Moreover, the additional frusto-conical portion 121 of the mounting cup 112 gives the valve 110 the ability to be able to withstand greater fluid pressures within the container than a conventional valve. This is because the frusto-conical shape is better 25 able to withstand pressure than the traditional flat ended mounting cups.

It has the added advantage of making the valve 110 easier to install on a container because of the extra space available for the crimping tool.

5 The valve 210 and 310 shown in Figures 3 and 4 respectively are in almost all respects identical with the valve 110 of figure 2, and like features have again been designated numerals increased by one hundred and two hundred respectively. In the valve 210 of Figure 3, however, the skirt 222 of the sealing sleeve 215 extends
10 beyond the frusto-conical portion 221 of the mounting cup 222, right up to the gasket ring 213 in the annular collar 211. In this embodiment, the force tending to retain the sealing sleeve 215 against the mounting cup 212 will be even greater than in the Figure 2
15 embodiment. An important advantage of the valve 210 shown in Figure 3 is that it is particularly convenient for use with fluids which should not be allowed to come into contact with the mounting cup 212.

20 In the valve 310 of Figure 4, the skirt 322 of the sealing sleeve 315 conveniently incorporates the gasket ring 313 as an integral part. Clearly, it is not possible for the sealing sleeve in this embodiment to lift off the mounting cup and cause leaks.

CLAIMS:

1. A valve for a pressurised dispensing container comprising a valve cup for securing to the container, a valve stem extending through an aperture in the valve cup and having a valve head and a shoulder spaced from the valve head, ports being provided in the valve stem adjacent the valve head, and a resilient sealing sleeve surrounding the valve stem and being located between the valve head and the shoulder, characterized in that the valve cup comprises a generally cylindrical portion (112) and a frusto-conical portion (121), the aperture being provided in the smaller end of the frusto-conical portion, and the sealing sleeve (115) includes a frusto-conical portion, (122) extending around said frusto-conical portion of the valve cup.

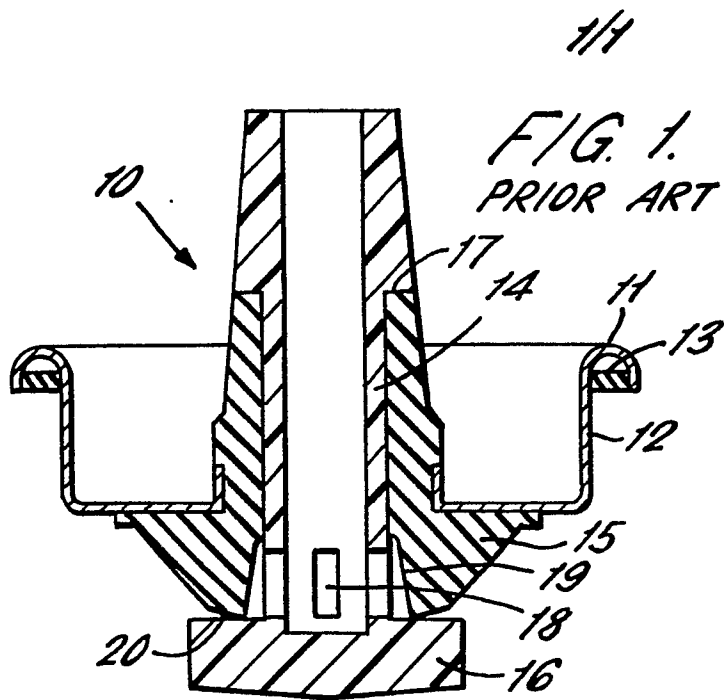
2. A valve as claimed in claim 1 characterized in that sealing sleeve (115) has a counterbore (119) surrounding the valve stem (114) at its end adjacent the valve head (116) to facilitate tilting of the valve stem.

3. A valve as claimed in claim 1 or claim 2 characterized in that the sealing sleeve (115) is externally chamfered at its end (120) adjacent the valve head (116) to facilitate tilting of the valve stem (114)

4. A valve as claimed in anyone of claims 1 to 3 characterized in that the sealing sleeve (215) includes an integral generally cylindrical skirt portion (222) extending around said generally cylindrical portion (212) of the valve cup.

5. A valve as claimed in any one of claims 1 to 4 characterized in that the sealing sleeve (315) further includes an integral, generally cylindrical skirt portion (322) extending around said generally cylindrical portion (312) of the valve cup and an integral gasket ring (313).

6. A pressurised dispensing container having a valve as claimed in any preceding claim.

*FIG. 2.*