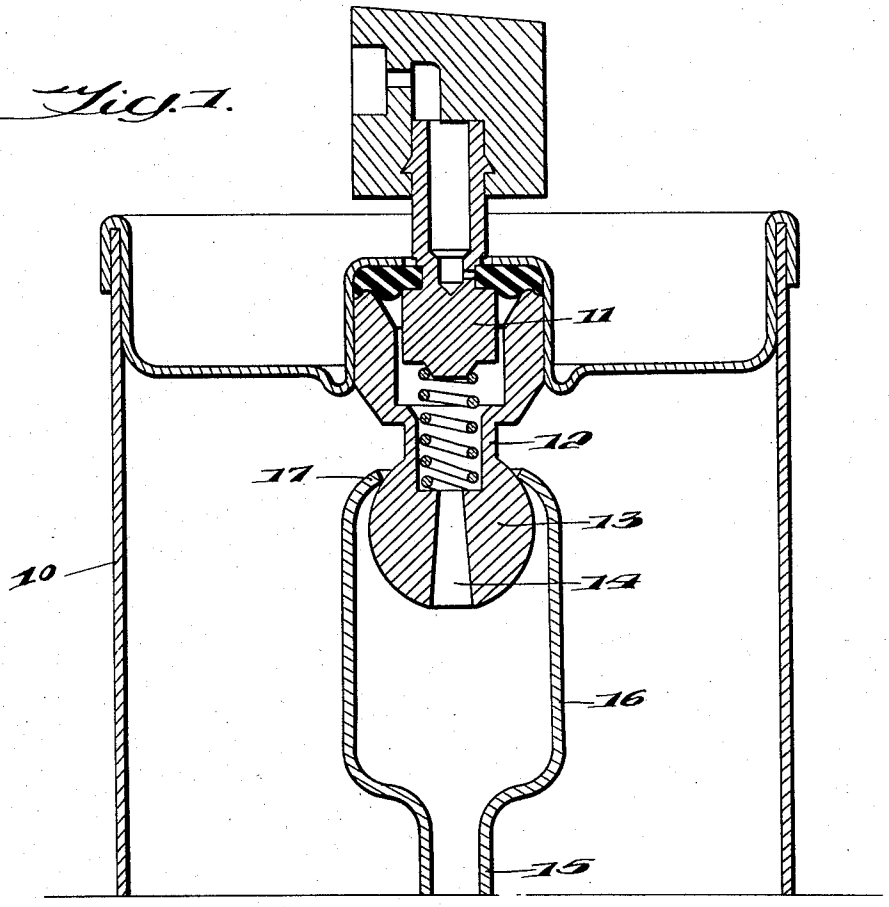
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DISPENSERS

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Fig. 1.



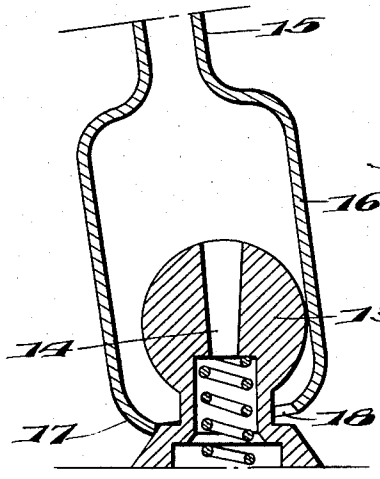


Fig. 2.

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Fig. 3.

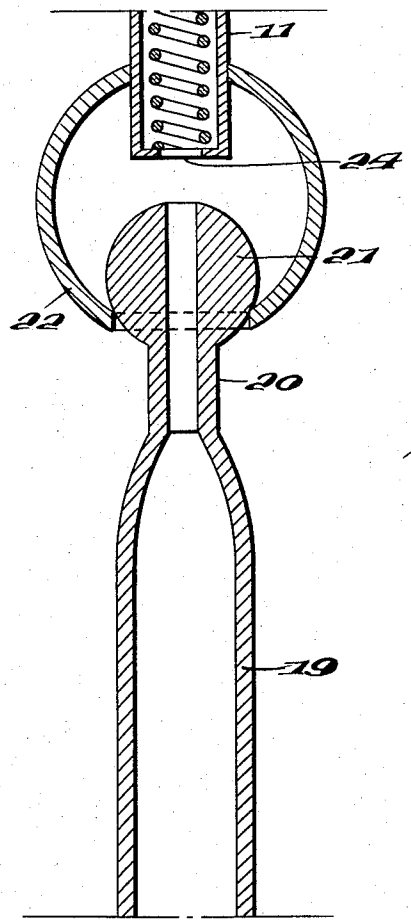
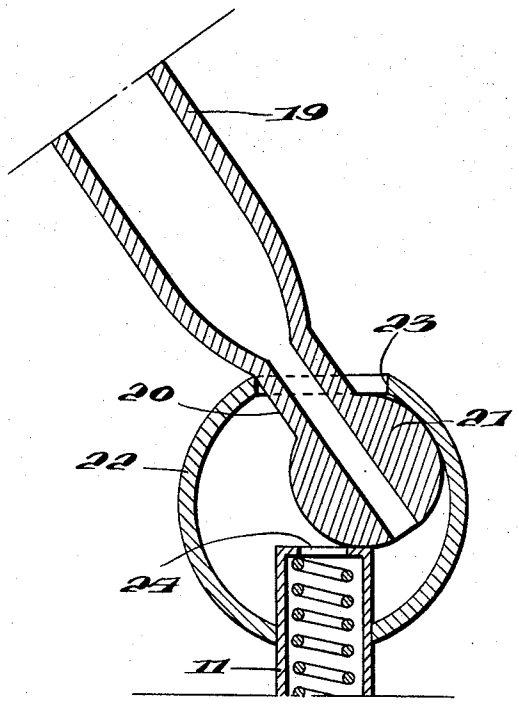


Fig. 4.



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2,920,798

DISPENSERS

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3 Claims. (Cl. 222—394)

This invention relates to improvements in dispensers for liquids or particulate substances which are maintained under pressure of a gas for discharge through an eduction tube which extends substantially to the bottom of the dispensing receptacle and dips into the contained material.

More particularly, the invention comprises a dispenser in which the eduction tube is articulated by means of a slip joint connecting its sections, the joint being of ball-and-socket type or of other suitable design permitting one section of the tube to swing relative to the other as the dispensing receptacle is tilted, and to separate the sections of tube sufficiently to open an alternate inlet which lies beneath the level of the contained material when the receptacle is inverted. Thus, when the dispenser is held upright, gas pressure on the surface of the liquid forces the liquid upwardly through the entire length of the eduction tube, but when the receptacle is inverted, with the end of the tube exposed above the level of liquid, the alternate inlet opens to admit the liquid to the eduction passageway from the opposite end of the receptacle.

In the general type of pressure discharge dispenser which has heretofore been in common use it has been necessary to hold the receptacle in upright position as it is being emptied, so that the end of the eduction tube dips into the contained liquid or other material, for in such dispensers if the end of the eduction tube becomes exposed, as when the receptacle is inverted or even appreciably tilted when only part full, gas alone will be discharged and when this occurs pressure within the receptacle is rapidly reduced to a degree which renders it ineffective to expel the remaining contents.

At times it is convenient, if indeed not necessary, to hold the dispenser inverted as, for example, in spraying insecticide into the crevice between a baseboard and floor, in applying paint to ceilings and corners, in applying pharmaceuticals, and in spraying such toiletries as hair dressing, cosmetics, dusting powder and perfume, as well as in dispensing many other products which are sold in pressurized packages.

It is accordingly an object of the present invention to provide a pressurized dispensing receptacle with an articulated eduction tube or passageway which is adapted to break at the juncture of the sections near the top of the receptacle when the receptacle is inverted, the sections being connected by a ball-and-socket joint or other connection permitting one section to swing in suspension from the other, and adapted to open an alternate inlet to the eduction passageway when one of its sections assumes an angular inclination to the other, and to close such alternate inlet when the dispenser is held upright or is only slightly tilted and the sections of eduction passageway are in complete or substantial alignment.

Other and further objects of the invention will be apparent from the following description and drawings in which,

Figure 1 is a longitudinal cross sectional view of a dispenser in upright position.

Figure 2 is a similar sectional view of the receptacle in inverted position.

Figure 3 is a detail view of a modified form of slip joint connection in the eduction passageway.

Figure 4 is a similar sectional view of the modification of Figure 3, showing the positions assumed by the sections of eduction passageway when the dispensing receptacle is held in inverted position.

Referring more particularly to the drawings, the dispensing receptacle **10** carries on the top a nozzle and a discharge valve assembly **11**. For purposes of illustration the discharge valve assembly is of a type commonly employed in aerosol dispensers in that it comprises a spring pressed plunger which flexes a diaphragm upon being depressed, to open a side port in the valve plunger leading to the nozzle. In accordance with the present invention, however, the discharge valve assembly includes a short tubular section **12** which extends downwardly into the receptacle and terminates in a bulbous end **13**. The tubular section **12** may be an integral part of the valve spring barrel, as shown, or it may be a separate piece press fitted or threaded into the discharge valve. In either case, it is in effect a section of the eduction tube or passageway and is to be so considered as herein described and claimed.

An eduction tube **15** hangs in suspension from the bulbous end **13** and dips into the liquid or other fluent material which is to be dispensed. Thus, when the receptacle is held in upright position, pressure of gas which fills the upper part of the receptacle forces the liquid through the length of the eduction tube or passageway to the nozzle.

The tube is suspended from the bulbous end **13** by an enlargement **16** constituting a socket in which the enlarged end **13** is received and retained by an annular inturned lip **17**, the end **13** of the one section of eduction tube being sufficiently smaller than the socket **16** on the adjoining end of the other section of eduction tube to permit swinging movement of the suspended section as well as its axial movement relative to the other. Thus, as shown in Figure 2, when the receptacle is inverted the socket **16** and enlarged end **13** partly telescope and the tube **15** assumes a canted position in which one end will rest against the wall of the receptacle, the annular lip **17** of the socket portion breaking contact with the surface of the bulbous end **13**, whereby a passage **18** is opened for flow of the liquid or other fluent contents of the receptacle into the eduction passageway through this alternate inlet, the same being submerged in the inverted position of the receptacle.

Alternatively, as shown in Figures 3 and 4, the eduction tube **19** may be formed with a necked down portion **20** and a terminal sperical end **21** which forms a seal with the marginal lip of a socket **22** when the tube hangs in suspension. Upon inversion of the receptacle the tube **19** assumes a canted position, as shown in Figure 4, and slides into the socket to open a passageway around the necked down portion **20** through which the liquid or other material may enter the passageway and pass through the discharge valve assembly **11** to the nozzle.

For purposes of illustration the joint between sections of the eduction tube or passageway are herein shown as being of spherical shape. It will be understood, however, that it is within the contemplation of this invention that the joint between the sections of eduction tube may be conical, or indeed of any other convenient shape which adapts the meeting sections of tube to be sealed against leakage of pressuring gas when they are in axial alignment, but to permit separation of the sealing surfaces when the receptacle is so appreciably tilted as to submerge the joint between the section and the alternate inlet which it controls.

I claim:

1. In a dispensing receptacle for liquids or powdered materials which are maintained under pressure of a confined gas, an articulated eduction tube connected to a discharge nozzle mounted on the receptacle and adapted to dip into the contained material when the receptacle is in upright position, said eduction tube comprising two universally jointed sections loosely connected end to end for limited telescoping movement, the adjoining ends of said connected sections having, respectively, outwardly and inwardly extending annular surfaces which are adapted to limit the separation of the sections by their overlapping interengagement and to provide a fluid-tight seal therebetween at the limit of their separation, one of said sections being telescopically slidable with respect to the other to disengage the sealing surfaces when the receptacle is inverted, whereby in such inverted position a secondary inlet is opened into the eduction tube at a level below that of the material to be dispensed from the inverted receptacle.

2. In a device according to claim 1, the outwardly and inwardly extending annular surfaces on the ends of the sections of eduction tube comprising a ball end on one such section and a cylindrical socket receiving the same on the adjoining end of the connected section, said socket being formed with a circular lip which seats on the ball end with full circumferential contact as the angular relationship of the articulated sections varies with tilting of the receptacle.

3. In a dispensing receptacle for liquids or powdered materials which are maintained under pressure of a confined gas, an articulated edduction tube connected to a discharge nozzle mounted on the receptacle and adapted to dip into the contained material when the receptacle is in upright position, the open end of the tube constituting a first inlet, said tube comprising two universally joined sections, one said section having a head at one end of larger diameter than the adjacent tubular portion of that section, the other said section having a socket the internal dimensions of which are larger than the dimensions of the head of the first said section and which has an inturned edge engageable behind the head of the first said section to provide a fluid-tight seal therebetween at the limit of their separation, one of said sections being slidable with respect to the other to break contact between the sealing surfaces thereof when the receptacle is inverted, whereby in such inverted position a second inlet is opened into the eduction tube at a level below that of the material to be dispensed from the inverted receptacle.

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