July 28, 1959 W. L. JACKSON 2,896,825

DISPENSING DEVICE

Filed Oct. 15, 1956

Fig. 1.

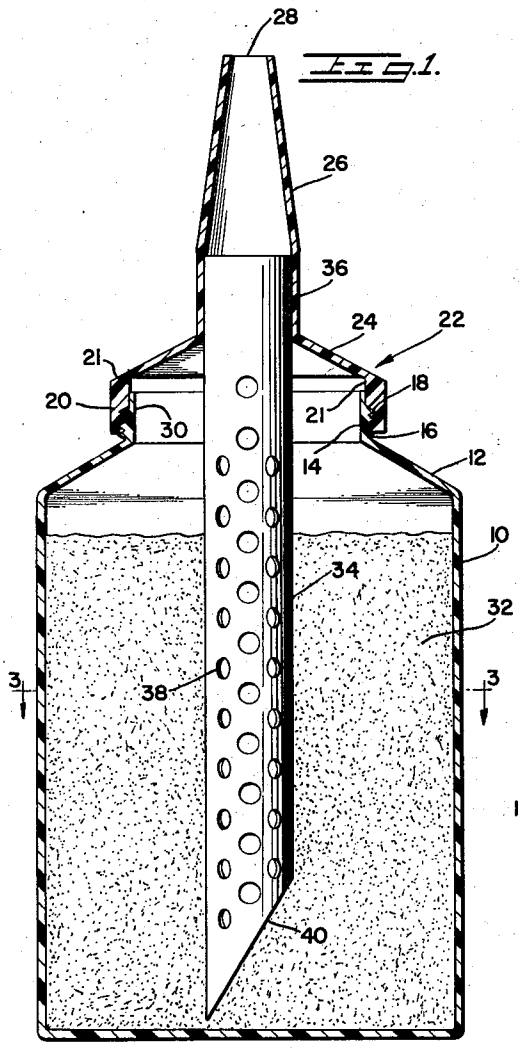


Fig. 2.

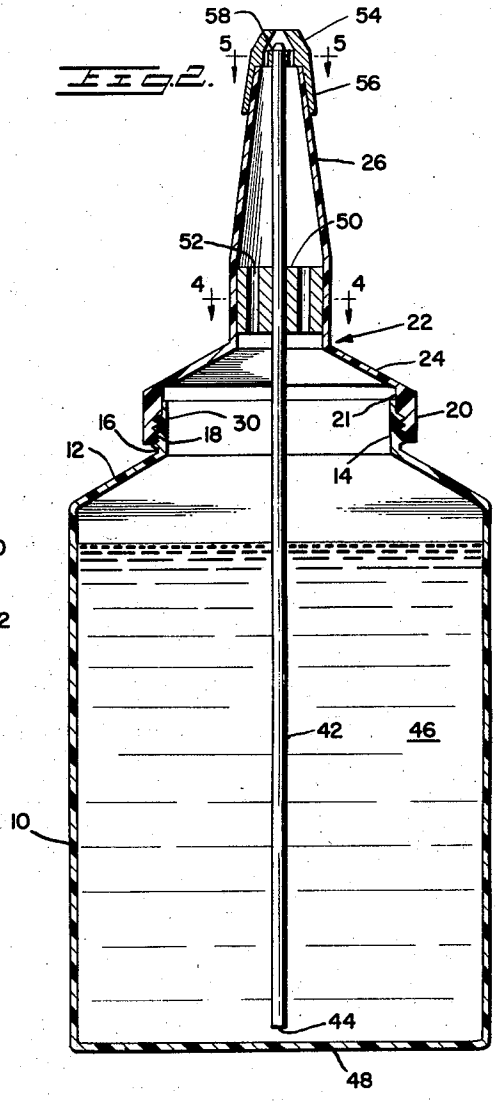


Fig. 3.

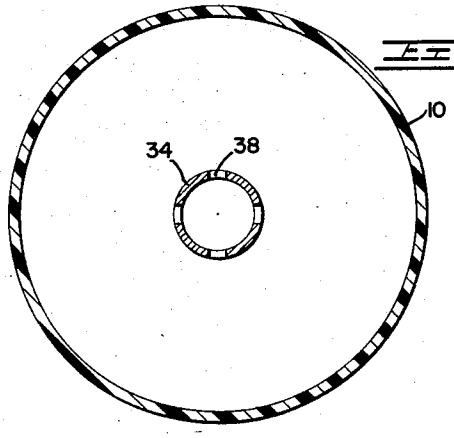


Fig. 4.

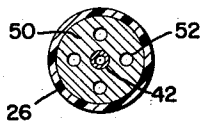
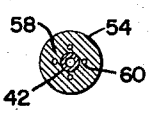


Fig. 5.



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DISPENSING DEVICE

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1 Claim. (Cl. 222—211)

This invention relates to a dispensing devices, and it particularly relates to such a device which is adapted to force the contents thereof out of the device under pressure created by manually squeezing it.

Although various types of pressure dispensing units are now on the market, these devices are not generally equally adapted for use with both powders and liquids. Furthermore, they generally cannot provide an effective seal between the parts if they are made of two or more parts to permit insertion of the contents. Usually, if the device were required to be effectively sealed to eliminate pressure leakage at a joint during operation, it was made in one-piece construction so that with the exhaustion of the contents, the device had to be thrown away. In those instances where the device was capable of being opened to replace the contents, in order to effectively seal the device at the joint, it was necessary to use separate gaskets or washers which were easily lost and which required careful manipulation into position in order to obtain the necessary sealing effect.

It is one object of the present invention to provide a dispensing device which is easily adaptable both to the dispensing of powders and of liquids or other fluids.

Another object of the present invention is to provide a dispensing device which easily and automatically effects an efficient seal between the separable parts of the device, and, therefore, permits the device to be re-usable.

Another object of the present invention is to provide a dispensing device which is simple in construction, easy to use, and not apt to become easily broken.

Other objects of the present invention are to provide an improved dispensing device, of the character described, that is easily and economically produced, which is sturdy in construction, and which is highly efficient in operation.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawing in which:

Fig. 1 is a sectional view of a device embodying the present invention.

Fig. 2 is a view, similar to Fig. 1, but showing a modification thereof.

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a cross-sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is a cross-sectional view taken on line 5—5 of Fig. 2.

Referring now in greater detail to the drawing wherein similar reference characters refer to similar parts, there is shown a container 10 preferably made either of synthetic resin such as polyethylene or polystyrene or of natural or synthetic rubber such as "neoprene." The container 10 is shown as being substantially cylindrical in its main portion, although the size and shape may be altered as desired.

The upper portion of the container 10 is provided with an inwardly sloping shoulder 12 which terminates in a generally cylindrical neck 14. This neck 14 is provided with external threads 16 adapted to threadedly engage with internal threads 18 on the skirt portion 20 of a cap 22, the inner wall of skirt portion 20 being slightly inclined. This cap 22 has an inwardly-inclined shoulder 24 extending from the upper end of the skirt portion 20 to the lower end 36 of a nozzle portion 26. This nozzle portion, which is constructed of resilient material tapers inwardly and upwardly to a dispensing opening 28. This cap 22, including the nozzle portion 26, is preferably constructed of "neoprene" rubber, polyethylene, or the like.

Integral with the upper end of the neck 14 is an upstanding thin flange 30. This flange 30, which is conically annular, in accordance with the formation of the rim of the neck 14, is also flexible, and acts as a sealing means between the neck of the container and the slightly inclined inner wall 21 of skirt portion 20 of cap 22 during the time that the contents of the container are being dispensed, by pressure created manually pressing on the side walls of the container. This flange 30 acts in the manner of a valve which is forced out against inner wall 21 of skirt portion 20, the nearly vertical portions thus forming a sealing ring that is actuated by the manually created pressure and resiliency to tighten the sealing position against the inner surface of the skirt 20 by the force of the contents being expelled from the container and prevent leakage at this joint.

By means of the above construction, it is not necessary to apply a separate sealing ring or washer and to make certain that this sealing ring is in proper position. In the present device, the sealing flange 30 is always present and is always in position to effect a tight seal whenever needed.

Although the attachment of the cap 22 to the container 10 has been illustrated as being effected by engaging screw-threads, the connection may also be effected by a frictional engagement between the parts, or by any other desired means.

When the contents to be dispensed are in the form of a powder, such as shown at 32 in Fig. 1, a removable tube 34, of relatively large diameter is inserted into the cap at 36 while the cap 22 is removed therefrom. The cap is then applied over the neck 14 of the container in such manner that the lower end of the tube 34 is inserted into the container 10. The nozzle portion 26 being resilient and tapered, will frictionally engage on the tube and hold it in position, as indicated at 36.

The tube 34 is perforated, as at 38 to permit the mixture of powder and air from the container to enter into the tube and flow therethrough into the upper portion of the nozzle and out opening 28. The mixture of powder and air is prevented from escaping from the sides of the unit by the action of the sealing flange 30. The lower end of the tube 34 is beveled, as at 40, to facilitate entrance of the tube into the powder 32 during insertion of the tube, since this beveled end acts like a knife.

When the contents of the container are in the form of a fluid, such as liquid or spray, instead of the tube 34, there is inserted a relatively thin tube 42. This tube is inserted through adapter 50 and secured by tip 54 so that its lower end 44 is inserted deep into the fluid 46 and adjacent the bottom 48 of the container when cap 22 is fastened on to container 10.

In order to hold the tube 42 in position, there is provided an adaptor 50 having a central opening through which tube 42 extends. There are also provided a plurality of openings 52 in the adaptor to permit the downward flow of air to aid in the dispensing of the fluid through tube 42. The adaptor 50 is similar in diameter

to tube **34** so that it, too, may be frictionally held in position by the lower end **36** of nozzle portion **26**.

In order to diminish the size of the nozzle opening to accommodate the dispensing of a fluid rather than a powder, a tip **54** is provided to fit around the upper end of the nozzle. This tip, having a relatively small opening, may be held on the nozzle either by a friction fit between the nozzle and a skirt portion **56** on the top, as shown, or by means of interengaging screw-threads, or any other desired means. The internal area of the tip is provided with a bridge **58**, having a central opening to receive the upper end of the tube **42**, and a plurality of radially-positioned openings **60** to permit passage of air around the tube.

With certain materials neither tube may be desirable, and in such case, both tubes **38** and **42**, with its plug **50** and tip **54**, may be omitted, and the container may be thus used with either tube present.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

A dispensing device comprising a container having a flexible side wall and a closed bottom wall, a conical

neck extending upwardly from said container side wall, a thickened cylindrical externally threaded flange extending upwardly from said conical neck, a thin flexible unthreaded flange extending upwardly and slightly inclined inwardly from said threaded flange, a dispensing cap having a dispensing nozzle open at its end on one end of said cap and a thickened depending skirt on the other end of said cap, said skirt being unthreaded adjacent its cap end and internally threaded adjacent its open end to complement said threaded portion of said neck flange portion, a tube extending from within said nozzle to a position within said container adjacent said container bottom wall, said unthreaded flexible flange portion being arranged to expand upwardly and outwardly into sealing engagement against the unthreaded portion of said cap skirt under pressure created by manual squeezing of said container wall.

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