Feb. 28, 1956 A. K. STONE 2,736,469

SEALING AND POURING CLOSURES

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Fig.1

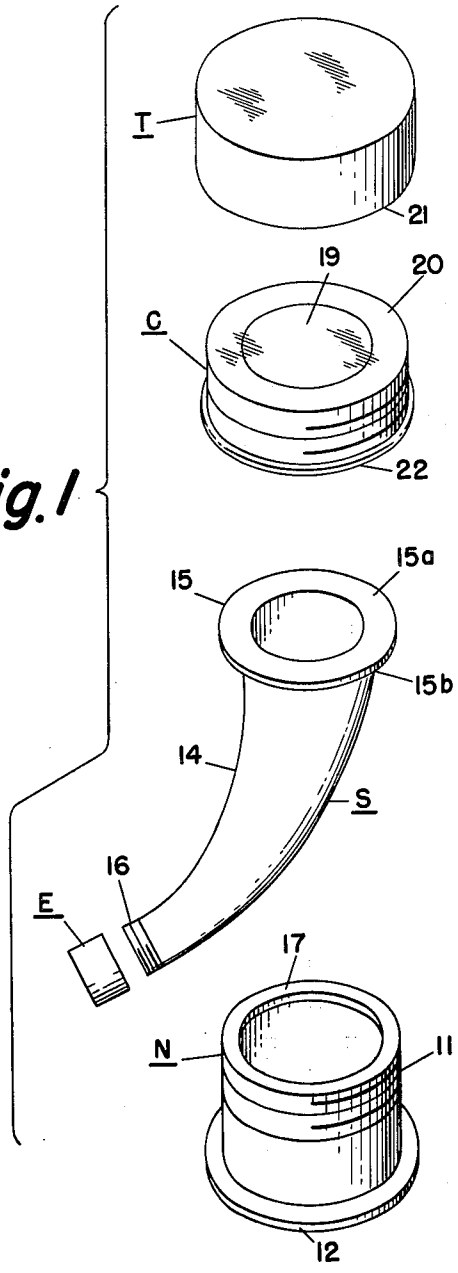


Fig.2

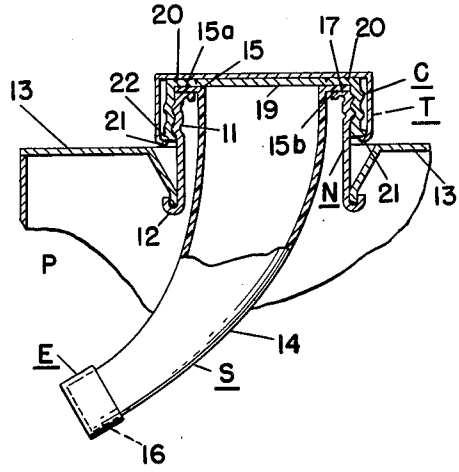
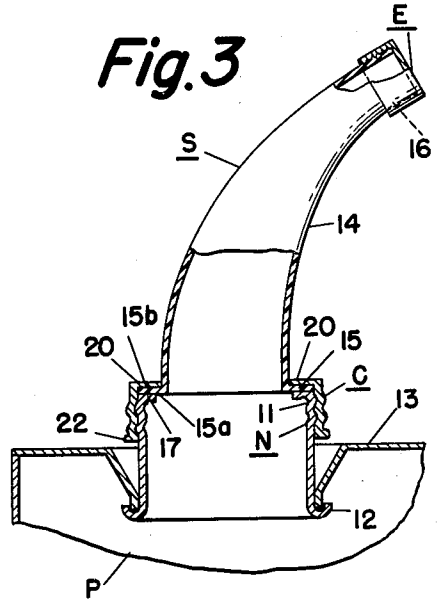


Fig.3



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Fig.4A

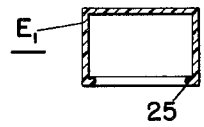


Fig.4B

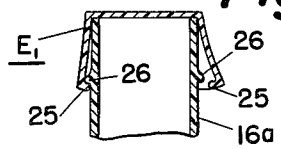


Fig.5A

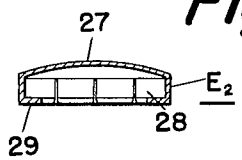


Fig.5B

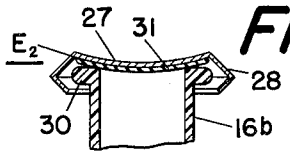


Fig.5C

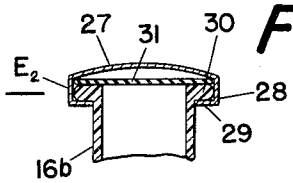


Fig.6

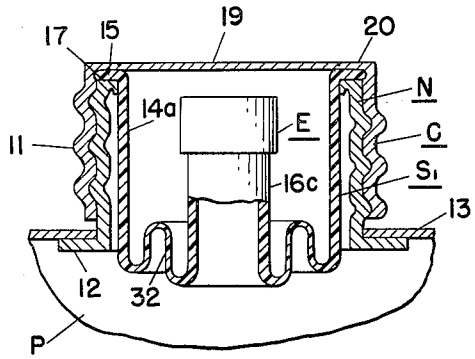
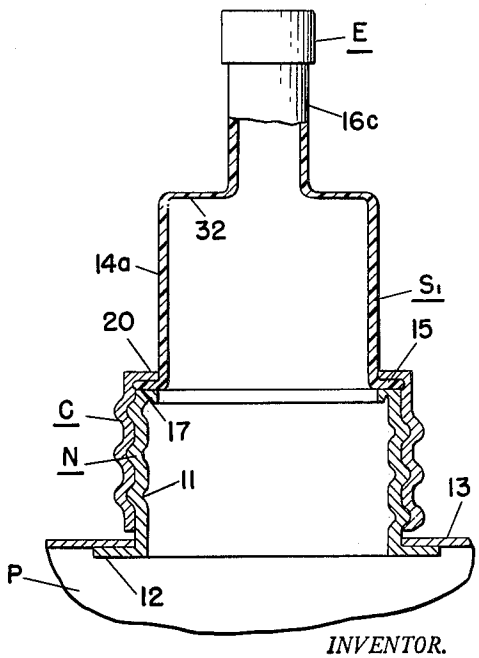


Fig.7



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SEALING AND POURING CLOSURES

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Application April 15, 1952, Serial No. 282,313

6 Claims. (Cl. 222—529)

This invention relates to sealing and pouring closures for cans, drums, pails and similar containers for various liquids such as petroleum products, paint products, chemicals and the like.

In accordance with the present invention, the closure for a container having an external threaded neck comprises, as one component, a screw cap whose top has a central integral section defining and bounded by a rim section and, as another component a pouring spout made of soft, resilient material resistant to the container contents and having at one end an integral outwardly extending flange. For shipment of the container, the spout is within the container with its flange squeezed between the rim section of the cap and the outer end of the neck to provide a liquid-tight seal; the open, flanged end of the spout being closed by the aforesaid central section of the screw cap. For dispensing of the container contents, the central section of the screw cap is removed by knocking or cutting it out to provide an opening through which the spout may extend exteriorly of the container in pouring position for which the spout flange is squeezed between the rim section of the screw cap and the outer edge of the container neck.

More specifically, in some forms of the invention, the spout is bodily reversed in position after the central integral section of the screw cap has been removed whereas in other forms of the invention, the discharge end of the spout is depressed within the spout body for shipment of the container and, after removal of the integral central section of the screw cap, is returned to normal extended position. In the former, the rim section of the screw cap engages one face of the spout flange for the shipping position of the spout and engages the opposite face of the spout flange after reversal of the spout to the pouring position: in the latter, the rim section of the screw cap engages the same face of the spout flange for both the shipping and pouring positions of the spout.

Further in accordance with the invention, the closure may also include a removable end cap for the discharge end of the spout, which end cap is preferably in place when the spout is in shipping position. The end cap may be threadedly received by the spout or preferably it is either a metal snap-on cap or a soft, pliable plastic cap.

Further in accordance with the invention, the closure also includes a shipping seal, such as an unthreaded cap, which overlies the screw cap to prevent accidental removal of its integral knock-out section and to preclude removal of the screw cap without evidence of tampering.

The invention further resides in features of construction, combination and arrangement hereinafter described and claimed.

For a more detailed understanding of the invention and for illustration of preferred embodiments thereof, reference is to be had to the accompanying drawings in which:

Fig. 1 is a perspective view of the components of one form of sealing and pouring closure;

Fig. 2 is a sectional view of the parts appearing in Fig. 1 as assembled in container-shipping relation;

Fig. 3 is sectional view of parts appearing in Fig. 2 as re-assembled in pouring relation;

Fig. 4A is a sectional view of a modification of the spout closure of Fig. 1;

Fig. 4B illustrates application of the spout closure of Fig. 4A to a spout;

Figs. 5A, 5B and 5C are sectional views illustrating another modification of the spout closure of Fig. 1; and

Figs. 6 and 7 illustrate the shipping and pouring positions respectively of a modification of the closure of Fig. 1 utilizing a different pouring spout.

The closure shown Fig. 1 comprises five components—the neck N, the spout S, the clamping cap C, the anti-tamper seal T, and the spout closure E. For clarity, the thickness of the neck, screw cap and seal is exaggerated in the drawings. The neck member N comprises a tubular exteriorly-threaded section **11** provided at one end with a flange **12** or other suitable integral structure for attachment to the wall **13** of a container peripherally of an opening therethrough. Usually, but not necessarily, the neck N is of thin sheet metal and is attached as by soldering, welding, crimping or the like to the wall structure **13** of the container P. As indicated in Figs. 2 and 3, the threaded section **11** of the neck N projects exteriorly of the container.

The pouring spout S is of soft, resilient material, such as a polyvinyl plastic or any of the various types of synthetic rubbers, including neoprene, which can be molded and which will retain its shape with adequate rigidity to serve as a pouring spout. The type of material used in a particular instance will be selected to resist deterioration by the liquid to be dispensed. As shown in Fig. 1, the body **14** of the spout S is preferably of tapering cross section, and in any event terminates at one end in an outwardly extending flange **15**.

For shipment of the filled container, the small end of the pouring spout S is passed through the neck N (Fig. 2) so that the body **14** of the spout extends into the interior of the container, the face **15***b* of flange **15** engaging the outer edge **17** of the neck N when the spout is in this position. The spout is clamped in this position by cap or cover C which threadably engages the neck N. As the screw cap C is tightened, it top marginal or rim section **20** deforms the soft flange **15** of the spout to insure a liquid-tight seal between the spout, neck and cap. The central section **19** of the screw cap, which is an integral part of the cover top, overlies the open upper end of the spout (Fig. 2) so that there can be no discharge through the spout S whether or not the end cap E of the spout is in place on the normal discharge end **16** of the spout. As later explained, this central section **19** of the screw cap is defined, as by scoring, so that it may later be pressed, knocked or cut out of the cap top.

Preferably, the closure includes an outer seal T which in the form shown is a thin metal cap which is unthreaded so that it may be slipped over the screw cap C (Fig. 2). The lower edge **21** of cap T may be crimped under the lower edge **22** of the screw cap so that the cap cannot be removed without leaving evidence of tampering. The outer seal T when of the cap type shown also prevents accidental press-out or knock-out of the central section **19** of cap C. This outer seal T has no leak-proof characteristics and may be replaced by other suitable types of anti-tampering seal.

Upon arrival of the container at point of dispensation of its contents, the seal T is removed. The screw cap C and spout S are removed and separated. The central section **19** of the screw cap C is then pressed or cut out, leaving the top rim-section **20**. To facilitate such removal of the central section, as above stated, it may be

defined as by circular scoring on either or both faces of the cover. With the central section **19** removed, the screw cap C is now in the form of a collar having through its top an opening somewhat larger than the maximum diameter of the tapered body section **14** of the spout but smaller than the diameter of flange **15**. The spout S is then inserted through this opening in inverted position with respect to that shown in Fig. 2 and the cap C is again screwed onto the neck **11** of the container so that the bodily-reversed spout now extends exteriorly of the container as shown in Fig. 3. With the spout in such inverted or pouring position, the face **15***a* of the spout flange **15** is in engagement with the outer edge **17** of the neck so that as the cap is screwed down, its rim portion **20** deforms the flange to effect a liquid-tight seal between the neck, spout and cap.

After partial removal of the container contents, it may be desirable for one reason or another again to return the spout to position within the container as in Fig. 2, in which case the outer shipping seal T may be used as a dust cover overlying the neck N, screw collar C and open upper end of the spout S.

A small cap for closing the discharge tip **16** of the spout S may be of the same soft type of plastic used for the spout or it may be one of the hard plastics such as phenol formaldehyde or urea formaldehyde: alternatively, it may be of tin plate, tern plate or black plate again depending upon the nature of the liquid. The cap E (Figs. 1 to 3) may be of soft or hard material internally threaded to engage threads molded at the discharge tip **16** of the spout. When of soft plastic, Figs. 4A, 4B, the cap E_1 has a bead or inwardly turned lip **25** at its open end. To close the spout, the cap E_1 is pulled or stretched over the discharge end **16***a* of the spout to effect sealing engagement between the cap lip **25** and an outwardly extending flange **26** molded near the end of the discharge tip.

Another preferred tip cap E_2 of the snap-on type is shown in Figs. 5A, 5B, 5C. It is of thin, springy metal in the shape of a slightly convex disc **27** whose periphery terminates in a series of depending spring fingers **28** with inturned ends **29**. When the center of disc **27**, Fig. 5A, is depressed, it snaps to the position shown in Fig. 5B with its fingers defining an opening somewhat greater in diameter than the flange **30** at the end of discharge tip **16***b* of the spout. When the fingers **28** are pressed from opposite sides of cap E_2, the disc **27** snaps to its original position, Fig. 5C. The finger tips **29** of the cap E_2 sink into the soft material of the spout and hold the cap firmly in position. Preferably, for enhanced sealing, the cap E_2 is provided with an insert **31** of soft rubber, plastic or the like which is pressed by the cap E_2 against the outer face of the tip flange **30**. Any of these caps may be used either with the reversible spout S of Figs. 1 to 3 or the push-in spout of Figs. 6 and 7 now to be described.

In the modification shown in Figs. 6 and 7, the spout S_1, like the spout of the preceding figures, is of soft resilient material and is provided with a flange **15** which is clamped between the neck N and screw cap C. The body section **14***a* of spout S_1 is connected to the discharge tip section **16***c* by an integral diaphragm section **32**. To close the filled container for shipment, the spout S_1 is collapsed, Fig. 6, with its discharge tip **16***c* telescoped within the body section **14***a*. The screw cap C is tightened down on the neck to clamp the soft flange **15** of the spout S_1 against the outer end of the neck N so to seal the cap, neck and spout. The central integral section **19** of the screw cap overlies the opening at the upper end of the body section **14***a* of the spout. Preferably, the tip of the spout is closed by tip cap E, E_1 or E_2 for this position of the spout.

As in the modification of Figs. 1 to 3, a sealing cap T may be slipped over the cap and crimped in place to avoid accidental knockout of the central section.

To put the closure of Figs. 6 and 7 in condition for pouring, it is only necessary to knock out, press out or otherwise remove the central section **19** of cap C, whereupon the tip **16***c* may be pulled out to extend the spout S_1 to the position shown in Fig. 7. It is not necessary, as in Figs. 1 to 3, to remove the cap and spout and bodily to reverse the position of the spout. With this modification, the upper face of spout flange **15** is engaged by the rim **20** of cap C for both the shipping and pouring positions of the spout, and the lower face of flange **15** is engaged by the end of neck N for both of said spout positions.

In both the modifications of Figs. 1 to 3 and 6, 7, the screw cap may be so internally formed near the closed top as to provide a groove which receives the edge of the flange **15** of the spout. Thus the spout and cap may be assembled for handling as a unit in closing a filled container for shipment.

It shall be understood the invention is not limited to the arrangements specifically shown and that equivalent arrangements are comprehended by the appended claims.

What is claimed is:

1. In combination with a container having a threaded neck extending exteriorly of the container, a sealing and pouring closure for said container comprising a pouring spout of deformable material, said pouring spout having an open inlet end with an integral flange of said material extending outwardly from said open inlet end, said spout for shipping of the container extending into said neck and for pouring from the container extending outwardly from said neck, and a screw cap having a threaded side section for removably threadably engaging the neck of the container, said screw cap having a closed top formed by a rim section, and an integral central section defining and bounded by said rim section, said rim section of the screw cap for both said shipping and pouring positions of the spout directly engaging said deformable flange of the spout and squeezing it against the container neck to provide a tight seal for the container, said integral central section of the screw cap overlying and closing off the spout when the spout is in shipping position, said integral central section of the screw cap being severed from the rim section after shipment of the container, then to provide an opening through which the spout extends in pouring position with said deformable flange of the spout squeezed against the neck of the container by the rim section of the screw cap.

2. A combination as in claim 1 in which the spout for shipping of the container extends through the neck with one face of the deformable spout flange pressed against the outer end of the neck to form a seal and in which the spout for pouring from the container extends outwardly from the neck with the opposite face of the deformable flange pressed against the outer end of the neck to form a seal.

3. A combination as in claim 1 in which the spout for shipping of the container is telescoped within the neck with a face of the spout flange in contact with the outer end of the neck and in which the spout for pouring from the container extends outwardly from the neck with the same face of the spout flange in contact with the outer end of the neck.

4. A combination as in claim 1 additionally including for the discharge tip of the spout a cap which is of soft, resilient material and which is provided with a peripheral flange for cooperating with a peripheral flange on the discharge tip of the spout to provide a seal.

5. A combination as in claim 1 additionally including for the discharge tip of the spout a cap which is a metal snap disc having peripherally thereof spring fingers yieldably received by the soft discharge tip of the spout.

6. In combination with a container having a threaded neck, a pouring spout having an integral outwardly extending deformable flange, and a screw cap having a threaded side section for removably threadably engaging the neck of the container and having a closed top with an annular rim section and an integral circular section, said annular rim section during shipment of the container

pressing said deformable flange of the pouring spout against the top of the container neck and cooperating with said integral circular section to provide liquid-tight integrity of the closure jointly provided by the cap and spout, said circular section of the cap being severable after shipment to provide an opening through which the spout extends for pouring of the container contents, said annular rim section of the screw cap and the deformable flange of the spout cooperating during pouring to provide a leak-proof seal at the joinder of the cap, spout and container.

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