Jan. 12, 1960 A. BINDER 2,920,799

SPOUT FOR METALLIC CONTAINERS

Filed Nov. 15, 1956

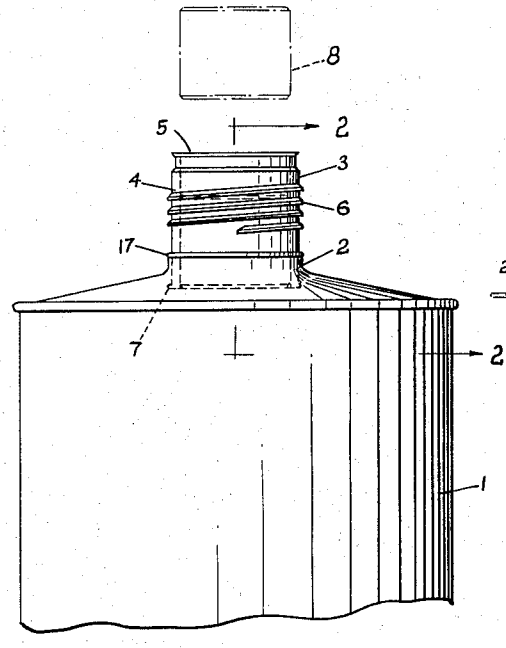


Fig.- 1

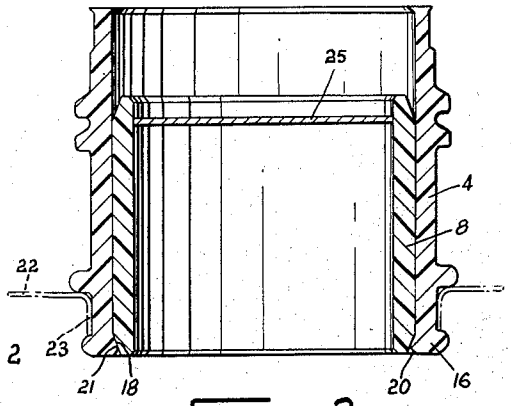


Fig.- 3

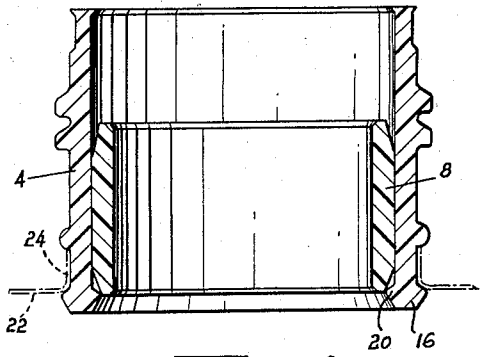


Fig.- 4

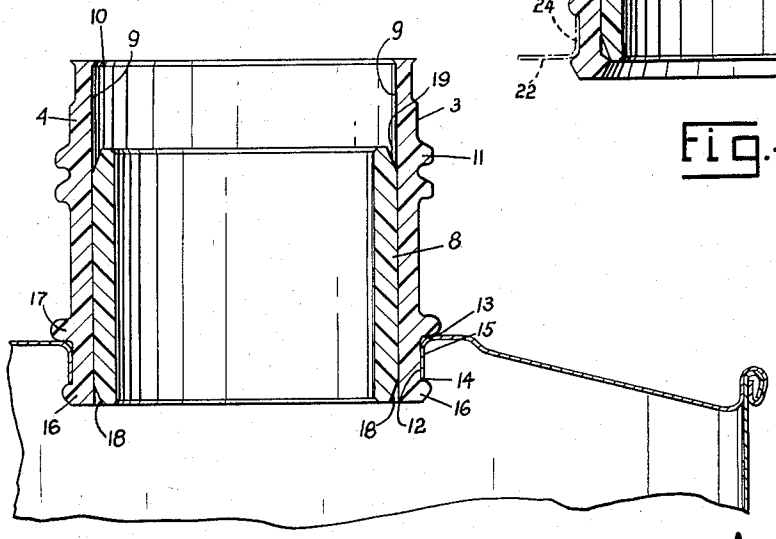


Fig. - 2

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SPOUT FOR METALLIC CONTAINERS

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5 Claims. (Cl. 222—541)

This invention relates, as indicated, to a novel spout for metallic receptacles or containers, and more particularly to a non-metallic spout for a metallic can.

The dramatic increase in the household use of liquid detergents as well as a multitude of other compositions which can be packaged in metallic containers has highlighted the need for a dispensing device which meets not only the requirements of the material contained, but also the requirements of the plants producing and/or packaging such materials. The liquid detergents, for example, do not lend themselves readily for packaging in wide-mouth containers. Consequently, the top portion of a tin can, for example, comprises a reducing neck and a relatively small diameter spout. The fabrication of these devices from metal, while not particularly complicated in and of itself, introduces problems in the rapid feeding of such entirely metallic devices to the top-affixing machines, because such tops with the protruding spouts are difficult to handle due to their generally unsymmetrical nature. They are hard to feed from a bulk storage and difficult to transport through conveyor lines.

To answer the problem of convenient dispensing and a non-corrosive spout, the industry has adopted many forms of plastic spouts or nozzles. One of the properties afforded by polyethylene or polypropylene, for example, is that it can be made into the so-called "dripless" spout by providing the outer lip with a champfered flange. To date, however, such polyethylene or polypropylene nozzles have been attached to the metallic container top portion, and the thus produced top-nozzle assembly then rolled on to the can body by suitable machinery. Again, the can fabricator is dealing with an unsymmetrical object which is difficult to handle.

There is, therefore, a need for a spout which can be attached to the metal can body after the metal portion of the container has been completely fabricated. The substantially cylindrical nozzles or spouts can be easily handled from a hopper and transported along current conveyor lines. The completed metallic portions of the container are also easily handled by current equipment.

It is a principal object of this invention, therefore, to provide a non-metallic spout for a metallic container which may be emplaced in the container after full fabrication of the metallic portion thereof. This necessitates a device which can be applied externally of the can body and secured thereto without resort to anchoring means or attachment means which rely upon underside forming attaching or anchoring means.

Other objects of this invention will appear as the description proceeds.

In its broadest aspects, therefore, this invention comprises the provision of an externally insertable spout for a metallic container which container has a rimmed circular opening therein. Such spout comprises in combination a resiliently deformable plastic nozzle having a tubular body with substantially non-tapering inner walls, and a flange at one end of diameter larger than that of said

circular opening and capable of passing therethrough upon application of deforming force, and a hollow cylinder adapted to be telescopically received and frictionally retained within said nozzle and to prevent substantial deformation of the nozzle in the region of said flange.

Throughout this specification the term "spout" will be understood as comprising the two parts above mentioned in combination. The term "nozzle" will have its ordinary meaning indicating the protruding exit or vent of a container or receptacle.

In the annexed drawing:

Fig. 1 shows a metallic container having a nozzle in accordance with the present invention affixed thereto prior to the introduction of the retaining ring or cylinder.

Fig. 2 shows a fragmentary enlarged cross section of the container and nozzle of Fig. 1 with the retaining ring in place.

Fig. 3 is a cross section of a modified spout in accordance with this invention.

Fig. 4 is a cross section of another modification in accordance with this invention.

Referring more particularly to the drawing, there is provided in Fig. 1 a metallic container 1 having a rimmed circular opening 2 therein. Mounted in said rimmed circular opening, there is provided a resiliently deformable plastic nozzle 3 comprising a generally tubular body 4 having a mouth 5 at its upper end, a threaded portion 6 intermediate its extremities, and a flange portion 7 shown internally of the container. In dotted lines there is further shown a retaining ring or hollow cylinder member 8 which is adapted to fit tightly within the tubular body 4.

Fig. 2 shows in somewhat better detail the structure of the spout composed of the combination of the nozzle 3 and the retaining ring 8. The inner walls 9 of the tubular body 4 are, it will be observed, substantially non-tapering. By the term "substantially" as used in this connection, is meant that such minor deviations from non-tapering as evidenced by the non-drip lip 10 and its inward protrusion, and such inward protrusion as may appear in flanges more particularly shown in Figs. 3 and 4 do not destroy the non-tapering aspect. The retaining ring 8 is able to negotiate or pass over the inward protrusion of the dripless structure 10 without substantial difficulty, due to the deformability of the plastic employed.

Also shown in Fig. 2 are means for retaining a cap such as threads 11 located intermediate the ends of the tubular body 4. It is obvious that other cap retaining means, such as, detents may be employed.

In the lower portion of the tubular body 4 there is provided a groove 12 defined by a pair of shoulders 13 and 14. The circumferential groove 12 is desirably of a diameter such that contact with the rimmed circular opening 15 of the metallic container is made. The lowermost shoulder 14 defines a flange 16 at one extremity of said tubular body 4. The diameters of the shoulders 13 and 14 are greater than that of the circular opening 15. The diameter of flange 14, while greater than the diameter of the circular opening 15, is further such that the flange 16 is capable of passing through the opening 15 upon application of deforming force in an axial direction. In the preferred case, the shoulder 13 may define a flange 17 which may have a diameter, as shown in Fig. 2, greater than the opening 15 and greater than the maximum diameter of the flange 16. In practical usage, it is desirable from a standpoint of handling these nozzles in a storage hopper to have the flange 17 of larger maximum diameter than that of the flange 16.

The retaining ring 8 may be provided with a champfered lower edge 18, and desirably a similarly champfered upper edge 19. The practicality of having both the upper

and lower edges similarly shaped is obvious in making unnecessary proper orientation of the retaining rings in the storage hopper for this part.

In Figs. 3 and 4 modification of the device shown in Figs. 1 and 2 is illustrated. In Fig. 3, for example, the flange **16** is provided with a radially inwardly directed portion **20** having a diameter less than the internal diameter of the tubular body **4**. The upper face **21** of the flange **20** may be so shaped as to engage the champfered face **18** of the retaining ring **8** and provide a seat for said retaining ring. It will be observed that the metallic portion of the container **22** is shown with a downwardly rolled opening **23**.

In Fig. 4, the metallic portion **22** is shown as an upwardly rolled opening **24**. The flange portion **16** of Fig. 4 is again somewhat differently shaped from that shown in Fig. 3, causing the retaining ring **8** to be disposed in a position somewhat short of the bottom of the tubular member **4**. By the application of downward pressure on the retaining ring **8**, the retaining ring **8** may be very tightly forced against the flange **16** and its inward protuberance **20**, causing the tubular body **4** to be tightly locked to the rimmed opening **24**.

The non-metallic portion of the container, i.e., the spout composed of the nozzle and retainer ring, may be fabricated most conveniently from polyethylene or polypropylene. The procedure for making such nozzles is a well known plastic molding procedure utilizing a two piece mold. Other materials may be used for the fabrication of both the nozzle portion and the retaining ring portion such as, for example, butadiene-styrene synthetic rubber, butadiene-acrylonitrile synthetic rubber, natural rubber, neoprene, polyvinyl chloride, etc.

The spout assembly is affixed by a simple press to the metallic container having a relatively small diameter opening in the top thereof (relative to the diameter of the can body). The nozzle portion is threaded onto a cylindrical member having a shoulder which can abut against the upper or dripless edge **5** as shown in Fig. 1, for example. Downward axial pressure will therefore force the flange **16** down through the rimmed opening **15** by causing a deformation of the deformable plastic. When the flange **16** has passed the obstruction provided by the rolled over rimmed opening **15**, it returns to its former shape and becomes retained within the opening by the engagement of the rimmed portion between the shoulders **13** and **14**. The shoulders cooperate to prevent both upward and downward movement of the nozzle with respect to the rimmed circular opening. In order that the nozzle may not be removed from the rimmed opening by a chance oblique blow, for example, directed at one side of the nozzle, the retainer ring **8** is sent home in the same operation by a smaller plunger operating within the device for seating the nozzle. The amount of travel of the plunger for seating the retainer ring **8**, it is well understood, can be regulated. With the retainer ring **8** in position, deformation of the tubular body **4** is prevented to an extent sufficient that the spout cannot be easily dislodged from its location in the rimmed circular opening.

The retainer ring **8**, as indicated above, may be made from the same material as the nozzle portion **3**, a stiffer embodiment of the same plastic (e.g., a higher polymer of polyethylene), or it may be made of a rigid material such as metal, fiber, or a resin impregnated paper. The O.D. of the retainer ring is such that a tight sliding fit is obtained with the I.D. of the nozzle **3**.

In Fig. 3 there is shown a modification of the retaining ring **8** wherein there is provided a frangible disc **25** closing the opening through the retainer ring **8**. In some cases it is desirable to provide an inner seal for fluid contents, which seal is to be broken by the consumer.

It will be observed, therefore, that there has been provided by this invention a means for attaching a non-metallic spout to a pre-fabricated non-metal can body, the entire attachment being effected externally of the container and without reliance upon anchoring means inserted from the under-side of the metal top of the container. One of the advantages of this feature is that the attachment of the spout to a metal container can be performed at the place where the container is filled, which is in most cases remote from the plate where the metallic can body is fabricated. The handling of containers without a protruding vent during filling operations is considerably easier and attachment of the spout and cap at the can filling operation is in many cases to be desired.

Other modes of applying the principle of this invention may be employed instead of those specifically set forth above, changes being made as regards the details herein disclosed, provided the elements set forth in any of the following claims, or the equivalent of such be employed.

It is, therefore, particularly pointed out and distinctly claimed as the invention:

1. An externally insertable spout for a metallic container having a rimmed circular opening therein, comprising in combination a resiliently deformable plastic nozzle having a tubular body with substantially non-tapering inner walls, one end having a circumferential groove defined by a pair of axially spaced apart shoulders having diameters greater than that of said circular opening, the shoulder next adjacent the extremity of said tubular body defining a flange capable of passing through said opening upon the application of deforming force, and the other end having a threaded portion adapted to receive and retain a cap; and a relatively stiffer hollow cylinder having non-tapering outer walls adapted to be telescopically received and frictionally retained within said nozzle and to prevent substantial deformation of the nozzle in the region of said flange.

2. An externally insertable spout for a metallic container having a rimmed circular opening therein, comprising in combination a resiliently deformable plastic nozzle having a tubular body with substantially non-tapering inner walls, one end having a circumferential groove defined by a pair of axially spaced apart shoulders having diameters greater than that of said circular opening, the shoulder next adjacent the extremity of said tubular body defining a flange capable of passing through said opening upon application of deforming force, said flange having an internal diameter less than that of the tubular body and defining an inwardly extending portion thereof; and the other end of said tubular body having a threaded portion adapted to receive and retain a cap; and a relatively stiffer hollow cylinder having non-tapering outer walls adapted to be telescopically received and frictionally retained within said nozzle and to prevent substantial deformation of the nozzle in the region of said flange.

3. An externally insertable spout for a metallic container having a rimmed circular opening therein, comprising in combination a resileintly deformable plastic nozzle having a tubular body with substantially non-tapering inner walls, one end having a circumferential groove defined by a pair of axially spaced apart shoulders having diameters greater than that of said circular opening, the shoulder next adjacent the extremity of said tubular body defining a flange capable of passing through said opening upon application of deforming force, said flange having an internal diameter less than that of the tubular body and defining an inwardly extending portion thereof; and the other end of said tubular body having a threaded portion adapted to receive and retain a cap; and a relatively stiffer hollow cylinder adapted to be telescopically received and frictionally retained within said nozzle and to prevent substantial deformation of the

nozzle in the region of said flange, said hollow cylinder further having a complementarily shaped portion adapted to engage and seat against the inwardly extending portion of said flange.

4. A spout in accordance with claim 3 in which said hollow cylinder is further characterized by having a frangible disc closing the opening therethrough.

5. A spout in accordance with claim 1 in which the circumferential groove has an external diameter equal to the internal diameter of the rimmed circular opening.

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CERTIFICATE OF CORRECTION

Patent No. 2,920,799 January 12, 1960

Alfred Binder

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 62, after "forming" insert a comma; column 4, line 8, for "plate" read -- place --; column 5, line 5, for the claim reference numeral "3" read -- 1 --.

Signed and sealed this 27th day of September 1960.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents

Notice of Adverse Decision in Interference

In Interference No. 91,526 involving Patent No. 2,920,799, A. Binder, Spout for metallic containers, final judgment adverse to the patentee was rendered Dec. 5, 1963, as to claims 1, 2, 3 and 5.

[*Official Gazette April 28, 1964.*]