Jan. 29, 1963 J. E. BORAH 3,075,676

CONTAINER SPOUT

Filed July 31, 1959 3 Sheets-Sheet 1

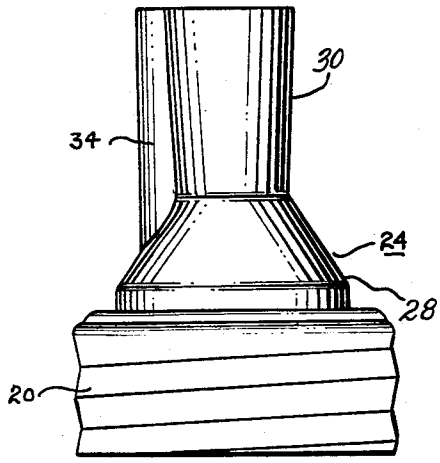

FIG. 1

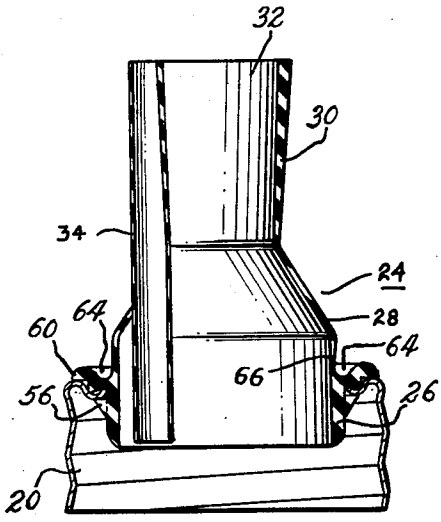

FIG. 2

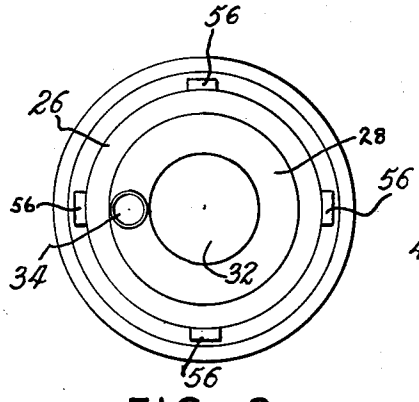

FIG. 3

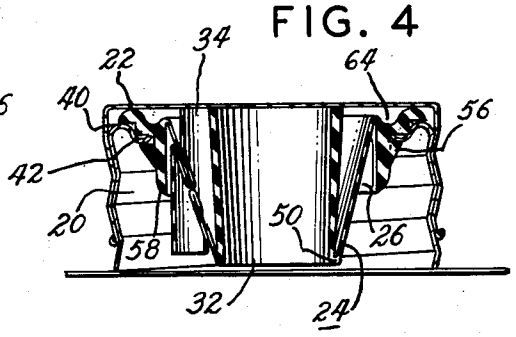

FIG. 4

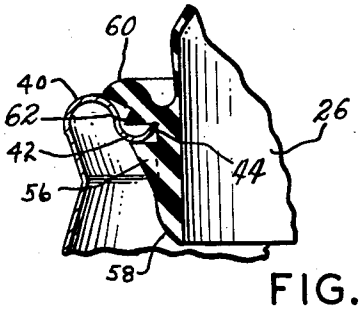

FIG. 5

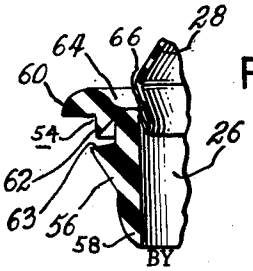

FIG. 6

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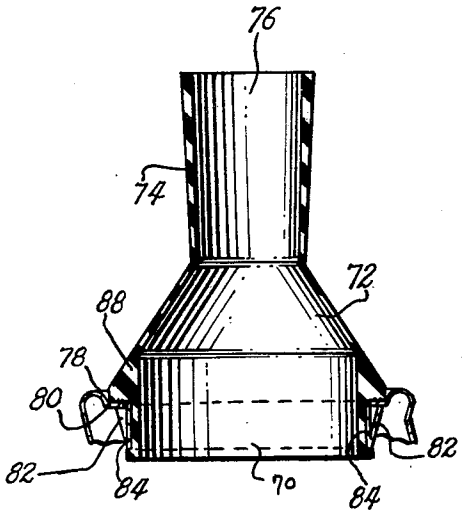


FIG. 7

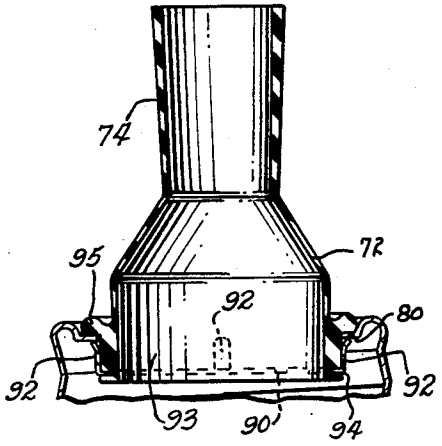


FIG. 10

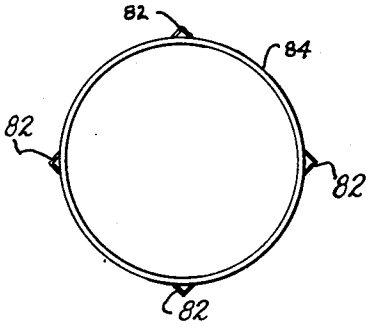


FIG. 8

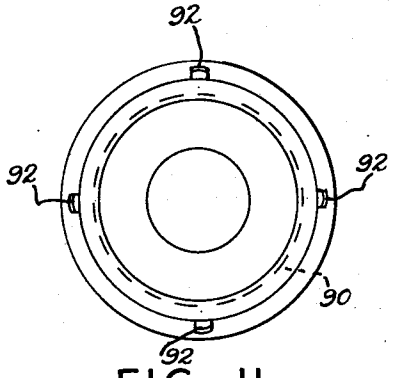


FIG. 11

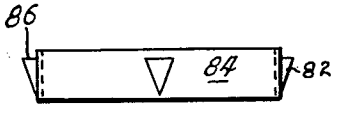


FIG. 9

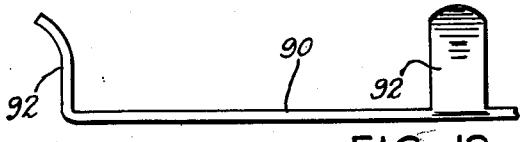
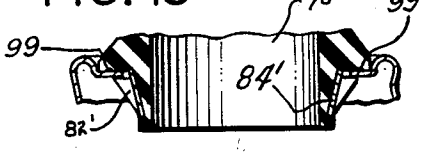


FIG. 12

FIG. 13



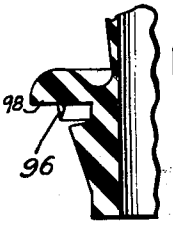


FIG. 14

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CONTAINER SPOUT

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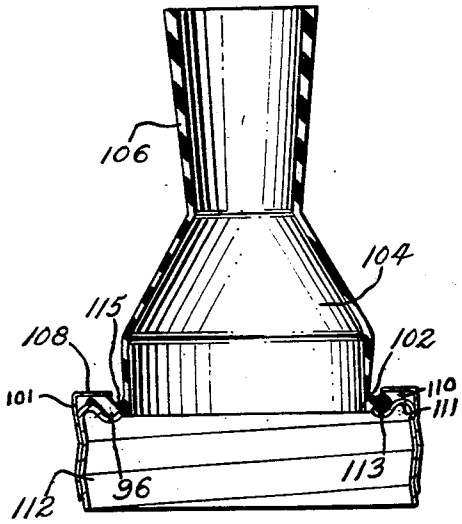

FIG. 15

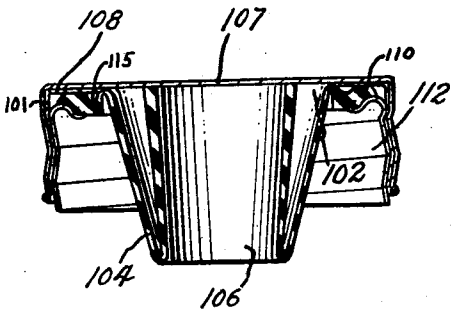

FIG. 16

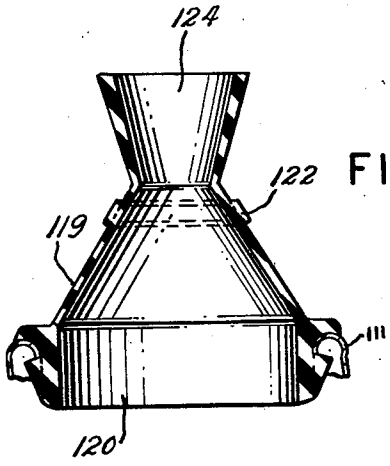

FIG. 17

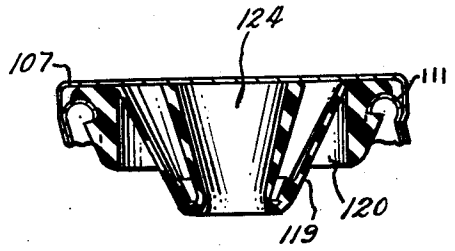

FIG. 19

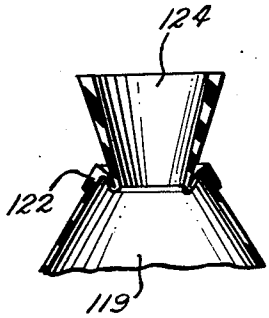

FIG. 18

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United States Patent Office

3,075,676
Patented Jan. 29, 1963

3,075,676

CONTAINER SPOUT

John E. Borah, % South Bend Modern Molding Inc., 815 E. Mishawaka Ave., Mishawaka, Ind.

Filed July 31, 1959, Ser. No. 830,833
6 Claims. (Cl. 222—527)

The present invention relates to containers and more particularly to collapsible or retractable spouts for containers.

The primary object of the present invention is to provide a spout for containers used in supplying fuel oil, kerosene and gasoline to tanks of burners, cooking stoves, space heaters and other types of heaters, motors and appliances, which eliminates spillage and reduces vapors and consequently eliminates or minimizes the hazard of fire and explosion in homes, shops and manufacturing plants and saves life and property loss.

Another object of the invention is to provide a retractable spout for containers, which can be easily snapped into place at the pour opening in the container at the factory, service station, farm or home, either singly or in a mass production operation, without the use of any tools or equipment, and which will remain firmly in place on the container until it is intentionally removed.

Another object of the invention is to provide a retractable spout for containers, such as one to five gallon oil cans and larger drums having necks or pour openings ranging in diameter up to three inches, which can be assembled in place on the container either before or after it has been filled, by merely pressing the base of the spout with a straight downward motion into the neck or pour opening, and which automatically forms an effective seal between the base and the structure defining the neck or pour opening.

Still another object of the invention is to provide a container spout which can be attached to the container at the time the container is filled and sealed and which is ready to use as soon as the container cap is removed and/or the seal broken.

A further object is to provide a container spout of flexible foldable material which can be assembled on a container by hand using unskilled or inexperienced help or by machines automatically as the containers move along assembly or filling lines and which permits the cap or seal to be readily assembled in place without any interference from the spout.

Another object of the invention is to provide a snap-on retractable spout for containers having an inwardly extending flange or bead around the pour opening, which inherently grips the flange or bead when it is assembled in place on the container, to form an effective seal between the container and spout and to prevent accidental dislodging of the spout from the opening.

Another object of the invention is to provide a spout having a built-in vent, which can be assembled as a unit onto a container and thereafter folded into the pour opening without any interference from the vent.

Additional objects and advantages will become apparent from the following description and accompanying drawings, wherein:

FIGURE 1 is an elevational view of one embodiment of my spout showing it assembled on the neck of a container, such as a five gallon can;

FIGURE 2 is a vertical cross sectional view of the spout and container neck shown in FIGURE 1, with the spout extended in pouring position;

FIGURE 3 is a bottom view of the spout shown in FIGURES 1 and 2;

FIGURE 4 is a vertical cross sectional view of the spout shown in the preceding figures, illustrating the manner in which the spout folds into the container neck, permitting the cap to be secured into place on the neck;

FIGURE 5 is an enlarged fragmentary cross sectional view of a portion of the spout and container neck, showing the manner in which the spout is assembled on the container;

FIGURE 6 is an enlarged fragmentary cross sectional view of a portion of the spout showing details in the construction of the base thereof;

FIGURE 7 is a vertical cross sectional view of a modified form, showing the spout attached to a container neck;

FIGURES 8 and 9 are top plan and side elevational views, respectively, of a part of the attaching means of the spout shown in FIGURE 7;

FIGURE 10 is a vertical cross sectional view of a further modified form, showing the spout attached to a container neck;

FIGURE 11 is a bottom view of the spout shown in FIGURE 10;

FIGURE 12 is an enlarged fragmentary elevational view of a part of the attaching means of the spout shown in FIGURE 10;

FIGURE 13 is a fragmentary vertical cross sectional view of still another modified form similar to the one shown in FIGURES 7 through 9;

FIGURE 14 is an enlarged fragmentary cross sectional view of a portion of a spout base showing the details in the construction of a modified form;

FIGURE 15 is a vertical cross sectional view of a further modified form of my spout showing it in its extended position on a container neck;

FIGURE 16 is a vertical cross sectional view of the spout shown in FIGURE 15, showing it in its folding position;

FIGURE 17 is a vertical cross sectional view of still another modified form of my spout in its extended position;

FIGURE 18 is a fragmentary vertical cross sectional view of the spout shown in FIGURE 17, showing it in a partially folded position; and

FIGURE 19 is a vertical cross sectional view of the spout shown in FIGURE 17, showing it in its fully folded position.

Referring more specifically to the drawings and to the embodiment of the invention shown in FIGURES 1 through 5, numeral 20 designates a neck of a container adapted to receive a screw cap 22, numeral 24 my retractable spout consisting of an annular base 26, a hollow conical section 28 joined at its large end to the base, a neck 30 joined at its lower end to the upper end of the conical section and having a passage 32 therethrough, and a vent means 34 extending generally parallel with passage 32 through the conical section to a point near the bottom of base 26. The neck of the container is provided with an annular ridge 40 at the top and an inwardly extending annular flange or bead 42, the one shown consisting of a trough-like flange spaced inwardly from the upper edge of the neck and having an upwardly extending inner edge 44. The entire structure of the spout is of one-piece molded rubber, although other materials such as flexible plastic material may be used if desired.

One of the principal features of this type of spout is its easy retractability into the pour opening of the container on which it is mounted and the complete non-interference of the spout with the capping of the container with a screw or crown type closure. The spout will maintain the positions shown in FIGURES 1 and 2 until it is intentionally retracted to the position shown in FIGURE 4, substantially fully within the pour opening or neck of the container. Vent 34 retracts with the spout without interfering with the spout foldability. The diameter of the neck gradually enlarges from the base at the conical sec-

tion to the upper free end and the walls thereof likewise gradually thicken from the conical section to the free end. This construction facilitates folding and unfolding of the spout and the rolling of the lower portion of the neck upon itself in the manner shown at numeral **50** in FIGURE 4, without weakening the free end of the spout to the extent that it will not hold its shape while liquid is being poured therefrom.

In filling and capping containers in assembly line operations, it is often important to be able to apply the spout with a single simple operation either manually or by machine. The present spout fulfills this requirement by a specially designed attaching structure on base **26** consisting of an annular overhanging marginal portion **54** adapted to seat firmly on the upper surface and free edge of flange **42** and on ridge **40** and form an effective fluid-tight seal therewith, and a plurality of spaced lugs **56** on the lower periphery **58** for snapping under and engaging the lower surface of flange **42**. As clearly seen in FIGURES 1 through 6, the lugs are tapered upwardly and outwardly from a point adjacent periphery **58**, which is somewhat smaller in diameter than the internal diameter of flange **42**, to a point well under the flange, preferably to the lowest point on the flange. In this embodiment the lugs are formed integrally with base **26**, and the lugs and base yield sufficiently to permit the lugs readily to pass flange **42** when the spout is snapped into place.

The marginal portion **54** consists of a distinct annular flange **60**, the underside of which seats on ridge **40**, and a sealing bead **62** which seats on the upper surface of flange **42**, thus forming two distinct seals, one on ridge **40** and the other on flange **42**. The distance between the overhanging margnial portion **54** and the lugs is such that the marginal portion and possibly the lugs must be distorted somewhat to assemble the spout on flange **42**, as illustrated in FIGURE 5. When used with the curved flange of the type shown in FIGURES 2, 4 and 5, the lugs are preferably tapered outwardly and downwardly on their upper surfaces **63**, as shown in FIGURE 6, to facilitate seating the lugs under the flange. The diameter of annular surface **63** may be slightly larger than the diameter of the inner edge of flange **42** so that a seal can be produced between said surface and edge when the spout is assembled properly on the neck. Another important feature of the present spout embodiment is the annular groove **64** at the bottom of conical section **28** and the straight sided portion **66** forming the lower part of section **28**. The walls of section **28** are also thinnest adjacent the groove as shown at numeral **66**. By this construction the initial folding of the spout occurs at this point when the spout is collapsed into the container neck and as a result an orderly folding of the conical section into base **26** is effectively obtained. The manner in which the initial folding occurs is illustrated in FIGURE 6. The upper surface of flange **60** is also rounded in the manner shown in order to facilitate the formation of an effective seal on ridge **40** without interfering with securing of the cap **22** to the container neck.

In assembling the spout just described onto a container, it is only necessary to place the annular base **26** in substantial alignment with the container pour opening and press the spout downwardly until the marginal portion **54** seats on flange **42** and lugs **56** lock under the flange. When this simple attaching operation has been completed, the spout is held firmly in place on the container neck or other pour opening with the base **26** in fluid-tight relationship with flange **42** and will not become accidentally displaced or leak around the flange during any normal use of the spout or container. An effective seal is formed between the spout and container neck even though not all of the lugs have been pressed beneath the flange during the assembly operation. When the cap **22** is to be secured to the neck, the spout is pushed downwardly into the neck into its fully telescoped position and the cap screwed on the neck in the same manner and with the same ease as if the spout were not attached to the neck.

In the embodiment of the present invention illustrated in FIGURES 7, 8 and 9, the spout is basically the same as the previously described embodiment, including an annular base **70**, a hollow conical section **72** joined at its large end to the base, and a neck **74** joined to the small end of the conical section and having a passage **76** therethrough. The container neck **78** is provided with an internal flange **80** positioned inwardly from the open end of the neck. In the attaching means in this embodiment the lugs **82** are of metal and are formed as an integral part of a metal ring **84** seated in an annular recess in the lower peripheral portion of base **70**. The ring is sufficiently resilient to permit the lugs **82** to snap under flange **80** and lock the spout in place on the container neck in the manner shown in FIGURE 7. The ring which is shown separate from the spout may contain three or more lugs **82** spaced around the outside surface, usually formed by pressing the metal of the ring outwardly to form a barb-like lug tapering downwardly and inwardly toward the bottom from a substantially straight upper surface **86**.

In order to give greater clearance between the flange defining the pour opening and the annular base of the spout, the ring may be tapered downwardly and inwardly in the manner shown in the modified form illustrated in FIGURE 13, numerals **82'** and **84'** indicating the parts thereof. The construction of the spout is otherwise the same as that described with reference to the previous embodiments. The metal ring formed as shown in either FIGURE 8 or 13 may be assembled on the spout base after the rubber portion has been completed, or the rubber portion may be molded onto the ring during the fabricating operation. To faciltiate assembly of the spout on the container, an extension **88** of the base into the lower portion of the conical section may be included, thus providing a heavy section of material to which downward pressure can be applied.

The embodiment of the invention disclosed in FIGURES 10, 11 and 12 is similar to the embodiment shown in FIGURES 1 through 6 with the exception that a metal ring **90** with a plurality of lugs **92** is employed in place of rubber lugs. This type of ring can be stamped and formed from sheet metal in a single operation and can easily be assembled on the spout base **93** by seating it in an annular groove **94**. Lugs **92** are slightly resilient and snap under the bead around the container opening when the spout is pushed downwardly into the container opening. The flange **95** seats on the upper surface of flange **80** without a sealing bead and is held in sealing engagement with said surface by lugs **92**.

In order to obtain a fluid seal between the spout base and the container around the pour opening, a sealing bead **96** is provided on the under side of flange **98** of the base. The bead is highly flexible and readily conforms to the configuration of the flange **80** and forms a tight seal with the upper surface thereof when the spout has been assembled on the container. The manner in which the bead **96** seats on the upper surface of the flange is indicated at numeral **99**. This type of sealing bead can be used with any of the spout embodiments shown herein.

The modified form of the invention disclosed in FIGURES 15 and 16 is similar to the form shown in FIGURES 1 through 6 but the lugs have been replaced by a screw thread locking ring **101**. The spout above the base **102** consisting of conical section **104** and neck **106** folds almost completely below the upper surface of the base when cap **107** is applied to the container, leaving only a small portion of the spout projecting above the container neck, as shown in FIGURE 16. Ring **101** has internally extending flange **108** which clamps flange **110** firmly against the upper end **111** of neck **112** and seats sealing bead **96** onto the upper surface of flange **113**. The external surface of ring **101** is threaded in the same manner as neck **112** and receives container cap **107** as shown in

FIGURE 16. The central opening in ring **101** permits the spout to move freely between the positions shown in FIGURES 15 and 16. Once the spout is secured onto the neck, ring **101** remains in place and does not interfere with the capping and uncapping of the container. An annular groove **115** is included in the base adjacent the bottom of the conical section to facilitate folding of the spout as described with reference to the embodiment in FIGURES 1 through 6.

The modified form of my spout shown in FIGURES 17 through 19 is similar to the form shown in FIGURES 15 and 16 except a conical section **119** with straight sides has been substituted for the contoured sides of the previous embodiment. This construction provides easy access to the heavy base **120** for the tool or machine applying the downward pressure to seat the spout on the container. To assist in the folding of the spout into the container, an annular rib **122** is provided on the external surface of the conical section preferably located near, but spaced from, the bottom of neck **124**. When pressure is applied to the top of the spout during the folding operation, the conical section initially breaks in the space between the base of the neck and the top side of rib **122**, as shown in FIGURE 18. Thereafter the conical section folds inwardly from the top downwardly to the position shown in FIGURE 19. The exact location and shape of rib **122** is not critical.

The lugs or barbs are preferably wedge-shaped as shown; however, protrusions of other shapes may be used in their place if desired, and the lugs will function satisfactorily with various shapes of flanges and beads surrounding the container pour opening. In the claims, the word container "flange" refers to and is intended to mean any type of internally extending member whether straight, rolled or otherwise curved, unless specifically defined as to structure, and the terms "downwardly facing" and the like in the claims are used merely for convenience and are not intended as limitations on the position or use of the spout.

While a number of embodiments of my snap-on retractable spout have been shown and described herein, various other changes and modifications may be made without departing from the scope of the invention.

I claim:

1. In combination with a container having a round pour opening therein with an internal annular flange: a retractable spout comprising an annular base of rubber or rubber-like material, a horizontal external flange at the upper edge of said base, said external flange being upwardly deflectable and having an annular downwardly facing sealing surface for seating on the upper side of said first mentioned flange, a sealing bead on said surface, an annular groove at the inner edge of said external flange disposed directly above the external surface of said base, an annular surface facing outwardly on said base disposed below and inwardly from said sealing surface, a plurality of spaced lugs on said annular surface, said lugs tapering downwardly and inwardly toward the bottom and having an upper substantially horizontal inwardly extending surface when engaging said container flange for locking the spout on the container, the distance between horizontal planes at the top of the lugs and at the lower side of said sealing surface being less than the distance between the parts of the container engaged thereby and said sealing surface being sufficiently flexible to permit said lugs to snap beneath the lower side of said flange, a flexible conical section joined at its large end to said base spaced inwardly from the edge thereof and being adapted to fold downwardly into said base, and a neck with a passage therethrough joined to the small end of said conical section.

2. In combination with a container having a round pour opening therein with an internal flange: a retractable spout comprising an annular base of resilient rubber-like material, a horizontal external flange at the upper edge of said base, said external flange being upwardly deflectable and having an annular downwardly facing portion for seating on the upper side of said first mentioned flange, an annular groove at the inner edge of said external flange disposed directly above the external surface of said base, an annular surface facing outwardly on said base disposed below and inwardly from said portion, a plurality of spaced lugs projecting outwardly from said annular surface, said lugs tapering downwardly and inwardly toward the bottom and having an upper substantially horizontal surface when engaging said container flange for locking the spout on the container, the distance between horizontal planes at the top of the lugs and at the lower side of said downwardly facing portion being less than the distance between the parts of the container engaged thereby and said downwardly facing portion being sufficiently flexible to permit said lugs to snap beneath the lower side of said flange, and a hollow member joined to said base for directing the flow of fluid from the container.

3. A spout for a container having means defining a round pour opening therein, comprising a rubber-like base, a horizontal external flange at the upper edge of said base, said external flange being upwardly deflectable and having an annular downwardly facing portion for seating on the upper side of said means, a sealing bead on said surface, an annular groove at the inner edge of said external flange disposed directly above the external surface of said base, an annular surface facing outwardly on said base, a plurality of spaced lugs on said surface for engaging said means having a substantially horizontal surface when locking the spout on the container, the distance between horizontal planes at the top of the lugs and at the lower side of said downwardly facing portion being less than the distance between the parts of the container engaged thereby and said downwardly facing portion being sufficiently flexible to permit said lugs to snap beneath the lower side of said means, and a hollow member joined to said base for directing the flow of fluid from the container.

4. In combination with a container having means defining a round pour opening therein with an internal flange: a spout comprising a rubber-like base, a horizontal external flange at the upper edge of said base, said external flange being upwardly deflectable and having an annular downwardly facing portion for seating on the upper side of said means, a sealing bead on said surface, an annular groove at the inner edge of said external flange disposed directly above the external surface of said base, an annular surface facing outwardly on said base, a plurality of spaced lugs on said surface having a substantially horizontal upper surface when engaging said container flange for locking the spout on the container, the distance between horizontal planes at the top of the lugs and at the lower side of said downwardly facing portion being less than the distance between the parts of the container engaged thereby and said downwardly facing portion being sufficiently flexible to permit said lugs to snap beneath the lower side of said flange, and a hollow member joined to said base and spaced inwardly from the edge thereof for directing the flow of fluid from the container.

5. In combination with a container having means defining a round pour opening therein with an internal flange: a retractable spout comprising a rubber-like base, a horizontal external flange at the upper edge of said base, said external flange being upwardly deflectable and having a curved upper surface, an annular groove at the inner edge of said external flange disposed directly above the external surface of said base, an annular downwardly facing portion for seating on the upper side of said means, projection means having an upper substantially horizontal surface when extending beneath said container flange for locking the spout on the container, the distance between horizontal planes at the top of said projection means and at the lower side of said downwardly facing portion being less than the distance between the parts of the container engaged thereby and said downwardly facing portion being sufficiently flexible to permit said means to

snap beneath the lower side of said flange, and a hollow member joined to said base and spaced inwardly from the edge thereof for directing the flow of fluid from the container.

6. In combination with a container having a round pour opening therein with an internal flange: a retractable spout comprising an annular base of resilient rubber-like material, a horizontal external flange at the upper edge of said base, said external flange being upwardly deflectable and having an annular downwardly facing portion for seating on the upper side of said first mentioned flange, an annular groove at the inner edge of said external flange disposed directly above the external surface of said base, an annular surface facing outwardly on said base disposed below and inwardly from said portion, a plurality of spaced lugs on said annular surface, said lugs tapering downwardly and inwardly toward the bottom and having an upper substantially horizontal surface when extending beneath said container flange for locking the spout on the container, an annular sealing surface on said outwardly

facing surface between said annular portion and said lugs, the distance between horizontal planes at the top of the lugs and at the lower side of said downwardly facing portion being less than the distance between the parts of the container engaged thereby and said downwardly facing portion being sufficiently flexible to permit said lugs to snap beneath the lower side of said flange, a flexible conical section joined at its large end to said base adjacent the inner and upper edge thereof, and a neck with a passage therethrough joined to the small end of said conical section.

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