

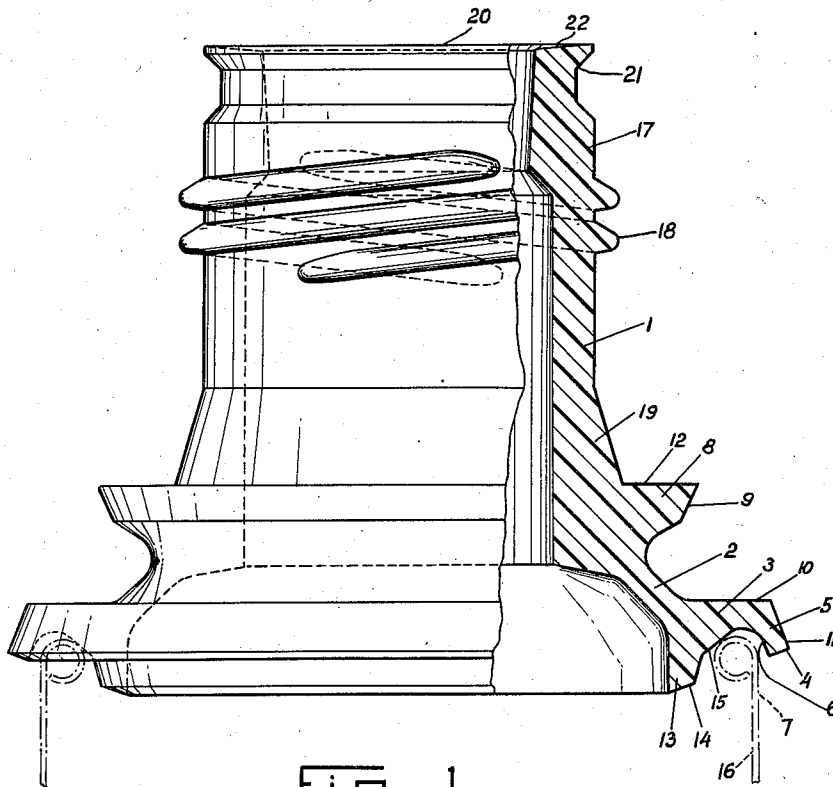
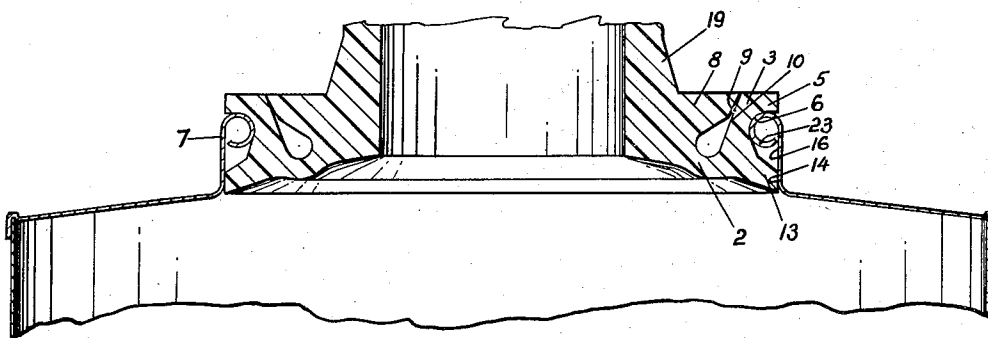
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ADAPTOR FOR NOZZLE, SPOUT, COUPLER, OR THE LIKE

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ADAPTOR FOR NOZZLE, SPOUT, COUPLER, OR THE LIKE

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This invention relates as indicated to a novel adaptor, and more particularly to a device for adapting one tubular opening to another tubular opening such as encountered, for example, in the cases of attachment of nozzles, spouts, tips, couplers, nipples, and the like to fluid conduits or containers having tubular openings therein.

In the attachment of nozzles, spouts and the like to containers or conduits, the structures of the prior art have ordinarily been of rather complicated design, more frequently than not involving more than the two pieces to be joined together and/or complicated machinery or clinching operations for effecting the connection between the adaptor and the tubular opening. It is a principal object of this invention, therefore, to provide an adaptor for a nozzle, spout, connector, etc. to a tubular opening in a conduit or container which is easily emplaced in the tubular opening and retained therein without additional mechanical or chemical bonding means.

Another object of this invention is to provide a nozzle, spout, or tip for a container, e. g., container of the metallic type adapted to be retained in the tubular opening of said container without additional mechanical and/or chemical means for effecting such retention.

Another object of this invention is to provide an adaptor for any of the above mentioned devices having rim lip engaging means cooperating with the tubular opening to prevent further insertion of the coupler into said opening.

Another object of this invention is to provide an adaptor having depth of insertion limiting means as well as gasket means for sealing the unit comprising the adaptor and the tubular member whereby the unit is rendered substantially liquid-tight.

Still another object of this invention is to provide a novel nozzle for a metallic container of the liquid detergent type which can be emplaced by the container manufacturer or the container filler, as may be desired, by the employment of very simple setting tools.

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

Recent advances in the art of casting certain polyethenoid plastic materials such as, polyethylene and polypropylene have spurred considerable development toward the use of these materials as structures for handling or containing chemical materials. The inertness of these high polymers to chemicals, their flexibility and their structural toughness have made them highly desirable materials of construction in these fields.

It has been found that by molding nozzles, spouts, tips, nipples, unions and the like from polyethylene having at least one extremity in accordance with the hereinafter described invention, a useful adaptor for the above named devices can be fabricated.

In the annexed drawing:

Fig. 1 shows a nozzle embodying the adaptor of the present invention in the lower portion thereof as a partial cross-section.

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Fig. 2 shows a cross sectional view in a reduced scale, of the adaptor portion of Fig. 1 in the locked-in-place position on a tubular opening of a container.

In its broadest aspects then, the present invention relates to an adaptor for a substantially tubular opening comprising a tubular member having a resiliently flexible outwardly flaring skirt at an extremity, an external peripheral flange integral with and depending from said skirt, the side of said flange away from said skirt being shaped to define a circumferential depending portion adapted to co-act with the extremity of said tubular opening to limit the extent of insertion therein, whereby said flange is bent back upon said skirt on insertion in said opening, and means for limiting the extent for bending back of said flange.

Referring now more particularly to Fig. 1 of the annexed drawing, there is provided a generally tubular member 1 having an outwardly flaring skirt 2 at one extremity. The other extremity of tubular member 1 may have any useful configuration such as, for example, a threaded lipped opening, a stepped tubular member for receiving flexible rubber tube, a tubular nozzle or other liquid dispensing structure, or the end shown in the lower portion of the tubular member 1 may be duplicated to provide a connector or union. Depending from the skirt 2 is an external peripheral flange 3, the side of said flange 3 away from said skirt 2 being shaped to define at least one circumferential depending portion or rim 5.

The inner (with respect to the axis of symmetry of the device) surface 6 of said depending portion 5 is desirably shaped to co-act with the extremity of the tubular opening 7 (shown in dotted lines) to limit the extent of insertion of the device into said tubular opening.

There is also provided in the device shown in Fig. 1 means for limiting the extent of bending back of the flange 3 when the adaptor is pressed "home," as explained hereinafter. These means are comprised of one, or the other, or both of two devices. The first of these is an annular shoulder 8 located between the skirt 2 and the tubular portion 1. The external face 9 of the shoulder may be adapted to co-act with and abut against the side 10 of the flange 3 adjacent said skirt when the flange 3 is bent back upon the skirt 2 after insertion into the tubular opening 7 indicated in cross section by dotted lines. It is convenient that the surfaces indicated at 12 and 10 of the shoulder 8 and the flange 3, respectively, be normal to the axis of the tubular member 1. In a further desirable, although non-essential, refinement of a device of this invention, the external surface 11 of the circumferential depending portion 5 is a frusto-conical surface adapted to become an extension of the surface 12 of the shoulder 8 when the flange 3 is bent back upon the skirt 2 and the surface 10 normal to the axis of the tubular member 1 is butted against the face 9 of shoulder 8.

The second alternate means for limiting the extent of bending back of the flange 3 upon insertion into a tubular opening 7 generally defined in cross section, is a second circular depending portion or rim 13 having a surface 14 away from or opposite the outwardly flaring skirt 2. In Fig. 1, the surface 14 is a continuation or extension of the surface 4 of the circumferential depending portion 5, and the concentric rims 5 and 13 are defined, then, by a groove 15 cut into the surface 4-14. The extent or depth of the rim 13 and the bias of the face 14 are so positioned and adjusted as to allow the face 14 to come into contact with the vertical wall 16 of the tubular opening 7 and abut firmly thereagainst. Because of the rigidity of relatively thick sections of the material from which these devices are conveniently produced, the surface 14 will be adapted to be telescopically received with-

in said tubular opening 7 and firmly restrained thereby from either outward or inward compression.

As indicated above, the means for limiting the extent of bending back of said flange 3 may also be composed of both the shoulder 8 and the depending rim 13 on flange 3.

The balance of the tubular member 1 away from the adaptor portion thereof may be described as a nozzle portion 17 having a threaded portion 18 intermediate the adaptor end generally indicated at 19 and the opening 20. The construction of the opening 20 will be recognized as the dripless type opening composed of a peripheral groove 21 and an inwardly sloping chamfered portion 22.

In Fig. 2, which is a cross section in reduced scale with respect to Fig. 1, the adaptor portion 19 is shown in the inserted or "locked-in-place" position. The shape or contour of the upper portion not shown in Fig. 2 is of no importance to this invention and it is intended by showing a partial view in this figure to emphasize that the other extremity may be any useful configuration such as will result in the device having the character of a nozzle, spout, tip, connector, unit, reducer, etc., or it may be a duplication of the extremity shown. Here the relatively thin resiliently flexible outwardly flaring skirt 2 has been bent back upon itself and the backward motion of the flange 3 stopped or limited by the shoulder 8 having face 9 thereof substantially contacting the face 10 of the flange 3. Also, the face 14 of the rim portion 13 has been forced into contact with the cylindrical wall 16 of the tubular member 7. The effect of the contacting of surface 14 of rim 13 with the cylindrical wall 16 of tubular opening 7 is to prevent further bending back of the flange 3 upon the flexible skirt 2.

Also shown in Fig. 2 is the manner in which the inner surface 6 of circumferential depending portion 5 co-acts with the inwardly curled or rolled lip 23 of the tubular opening 7.

In the assembly operation, the nozzle having groove 15 appropriately adapted for the container, is placed on the curled over-portion of a container, for example, and with a downward thrust applied at the shoulder 8, for example, forced into position with the relatively thin outwardly flaring skirt 2 providing the necessary resilient flexibility. The forces set up within the skirt 2 when flexed into the position shown in Fig. 2 are such as to cause a binding thrust tending to force the flange 3 outwardly, this motion being restrained by the tubular opening 7. In the preferred embodiment of the adaptor portion such as shown in Figs. 1 and 2, the thrust forces are kept below the rim or mouth of the tubular opening whereby the adaptor is held securely in place.

Considerable force in an outward axial direction is usually required to release the adaptor from the tubular opening.

The resiliently flexible material from which the nozzles and adaptor devices of the present invention may be made include polyethylene and polypropylene.

There has been provided, therefore, in accordance with this invention, a nozzle for a container or tube having a tubular opening therein comprising a tubular member having at an extremity thereof an externally threaded portion 18 adapted to receive a cap or other such closure member, not shown, and having a resiliently flexible outwardly flaring skirt 2 of relatively thin material at the other extremity, an external peripheral flange 3 integral with and depending from said skirt 2, the side 10 of said flange adjacent said skirt being normal to or perpendicular to the axis of said nozzle, and the side 14—4 of said flange away from said skirt having an annular groove 15 therein defining a pair of concentric rims 13 and 5, the inner of said rims (13) adapted to be telescopically received within the tubular opening 7, the outer of said rims (5) adapted to co-act with the extremity 23 of said tubular opening to limit the extent of insertion

therein, whereby the flange 3 is bent back upon the skirt 2 on insertion in said opening, shoulder means 8 annular with respect to said tubular member 1 and projecting therefrom adapted to limit the extent of bending back of said flange 3, said shoulder means 8 having the face 13 remote from the flange 3 in a plane normal to the axis of said nozzle, the external face 11 of the outer rim 5 being shaped to provide a continuation of said face 13 of the shoulder 8 remote from the flange 3 when the nozzle is inserted in the tubular opening 7.

These devices and others embodying the adaptor mechanism of the present invention are quickly, readily and tightly held in openings when said flange 3 is bent back upon the skirt 2. This operation can be performed upon containers in the container manufacturers' plant, or, if desired, the nozzles or other devices may be positioned on the tubular openings at the location of filling or utilization of the tubular member. It has been found that liquid detergent containers fitted with nozzle means in accordance herewith and a cap will contain the liquid detergent in an inverted position without leaking, illustrating the gasketing effect of the inner rim 13 and the co-acting face 14.

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 adaptor for a substantially tubular opening comprising a tubular member having a resiliently flexible outwardly flaring skirt at one extremity, an external peripheral flange integral with and depending from said skirt, the side of said flange away from said skirt being shaped to define a circumferential depending portion adapted to co-act with the extremity of said tubular opening to limit the extent of insertion therein, whereby said flange is bent back upon said skirt on insertion in said opening, and means for limiting the extent of bending back of said flange.

2. An adaptor for a substantially tubular opening comprising a tubular member having a resiliently flexible outwardly flaring skirt at one extremity, an external peripheral flange integral with and depending from said skirt, said flange having an annular groove on the side of said flange away from said skirt defining a pair of concentric rims, the inner of said rims adapted to be telescopically received within said tubular opening, the outer of said rims adapted to co-act with the extremity of said tubular opening to limit the extent of insertion therein, whereby said flange is bent back upon said skirt on insertion in said opening.

3. An adaptor in accordance with claim 1 in which the means for limiting the extent of bending back of said flange includes annular shoulder means intermediate the skirt and the end of said tubular member.

4. An adaptor in accordance with claim 1 in which the means for limiting the extent of bending back of said flange includes a second depending portion concentric with and having a diameter smaller than said circumferential depending portion, and adapted to be telescopically received within and bear against the inner wall of said tubular opening.

5. An adaptor in accordance with claim 1 in which the means for limiting the extent of bending back of said flange includes annular shoulder means intermediate the skirt and the end of said tubular member, and a second depending portion concentric with and having a diameter smaller than said circumferential portion and adapted to be telescopically received within and bear against the inner wall of said tubular opening.

6. An adaptor for a substantially tubular opening comprising a tubular member having a resiliently flexible outwardly flaring skirt of relatively thin material at one

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extremity, an external peripheral flange integral with and depending from said skirt, the side of said flange adjacent said skirt being normal to the axis of said adaptor and the side of said flange away from said skirt being shaped to define a circumferential depending portion adapted to co-act with the extremity of said tubular opening to limit the extent of insertion therein, whereby said flange is bent back upon said skirt on insertion in said opening, shoulder means annular with respect to said tubular member and projecting therefrom adapted to limit the extent of bending back of said flange, said shoulder means having the face remote from the flange in a plane normal to the axis of said adaptor, the external face of said circumferential depending portion being shaped to provide a continuation of said face of said shoulder remote from the flange when the adaptor is inserted in said tubular opening.

7. An adaptor in accordance with claim 6 in which the side of said flange away from said skirt is provided with an annular groove defining a pair of concentric rims, the inner of said rims adapted to be telescopically received within said tubular opening, and the outer of said rims adapted to co-act with the extremity of said tubular opening to limit the extent of insertion therein.

8. A nozzle for a container having a tubular opening therein comprising a tubular member having at one extremity thereof an externally threaded portion adapted

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to receive a cap, and having a resiliently flexible outwardly flaring skirt of relatively thin material at the other extremity, an external peripheral flange integral with and depending from said skirt, the side of said flange adjacent said skirt being normal to the axis of said nozzle, and the side of said flange away from said skirt having an annular groove therein defining a pair of concentric rims, the inner of said rims adapted to be telescopically received within said tubular opening, the outer of said rims adapted to co-act with the extremity of said tubular opening to limit the extent of insertion therein, whereby said flange is bent back upon said skirt on insertion in said opening, shoulder means annular with respect to said tubular member and projecting therefrom adapted to limit the extent of bending back of said flange, said shoulder means having the face remote from the flange in a plane normal to the axis of said nozzle, the external face of said outer rim being shaped to provide a continuation of said face of said shoulder remote from the flange when said nozzle is inserted in said tubular opening.

References Cited in the file of this patent

UNITED STATES PATENTS

2,207,176	Phillips	July 9, 1940
2,670,885	Allen	Mar. 2, 1954