Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6
NOZZLE FOR CAN OPENINGS AND THE LIKE

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Application July 23, 1930. Serial No. 469,943

7 Claims. (Cl. 220—40)

The present invention relates to containers and more particularly to nozzles adapted to be attached to containers, such as tin cans, for the application of closure caps thereto.

Cans with nozzle openings are commonly used for products such as paint and varnish, and are adapted for many other products. Cans containing such products ordinarily are opened and closed a number of times during the consumption of the contents. It is desirable and, in many cases, necessary that a closure be utilized which may be reapplied and which, preferably, will form a fluid-tight seal repeatedly. Efforts have been made to utilize cork stoppers, but these are usually damaged or mutilated during removal. Considerable difficulty has been encountered in making nozzles suitable for metal caps, which are adapted to form a secure seal as well as a resealable, the latter being very important in many instances.

The present invention aims to overcome these difficulties by providing a nozzle which may be easily manufactured, to which metal closure caps may be readily applied to form a secure seal, and which may also be quickly removed and resealed if desired.

An object of the present invention is to provide a nozzle for a can opening which may be readily manufactured and which will co-operate with a metal cap to form a secure seal.

A further object of the invention is to provide an inexpensive nozzle adapted to co-operate with a screw closure cap to form a secure seal.

Another object of the invention is to provide a nozzle having a downwardly depending skirt with recesses therein to receive the lugs of a cap, and with inclined edges on the lower part of the skirt adapted to pull the cap down on the container when properly rotated.

Another object of the invention is to prevent screw caps, applied to nozzles, from becoming loose thereon.

Another object of the invention is to provide a combined nozzle and screw cap adapted to form a secure seal which may be opened and resealed repeatedly.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawing, forming a part of the specification, wherein:

Fig. 1 is a side elevational view of a nozzle applied to a container, parts of the container being broken away;

Fig. 2 is a sectional view illustrating a preferred form of cap being applied to the recesses in the nozzle;

Fig. 3 illustrates the construction shown in Fig. 2, with the closure cap in sealed position;

Fig. 4 is a developed view of a portion of the nozzle, illustrating the shape of the lower edge of the threads thereof;

Fig. 5 is a sectional view along the line 5—5 of Fig. 4; and

Fig. 6 is a sectional view along the line 6—6 of Fig. 4.

Referring again to the drawing, in Fig. 1 there is shown a nozzle 1 applied to a tin can 2. The opening 3, in the can, may be flanged upwardly so that the body part 4 of the nozzle may be telescoped thereabout and soldered thereto if desirable. The upper part of the nozzle is flanged outwardly and rounded to form a crown or sealing surface 5. The flanged part, or skirt, of the nozzle is also bent downwardly and flared outwardly to form a shoulder 6 with a downwardly extending cylindrical part 7, substantially larger in size than the crown part 5.

The lower edge of the skirt is cut to form an inclined portion 8, merging into a horizontal portion 9, which has at its end a stop or vertical portion 10. The inclined portion 8 is adapted to form a cam surface which co-operates with projections on the closure cap, as described hereinafter, to pull the cap down on the nozzle to form a secure seal. The horizontal portion 9 forms a surface for holding the cap on the container, without creating any tendency for the cap to back off or become loose. The stop 10 prevents the cap from being turned too far on the container.

Suitable recesses 11 are cut in the shoulder 6 to facilitate the application of the closure cap thereto, the projections on the closure cap passing through these recesses and being afterwards forced under the surfaces 8 and 9. The recesses 11, in addition, serve the purpose of creating flexibility in the skirt portion of the nozzle, whereby the lower edge, under the pressure of the lugs of the cap, may flare outwardly and form a very tight grip. The recesses 11 are cut prior to the complete formation of the nozzle, and it is not necessary to compress or stretch the flange of the nozzle during the several shaping operations. These shaping operations, by reason of...
the recesses, resolve themselves practically into bending operations, which are easily performed, whereas stretching and compressing operations are more difficult.

As the preferred embodiment of cap for application to the nozzle is shown more particularly in Figs. 2 and 3, and comprises a cover portion 12 having a depending skirt 14 rolled outwardly into a wire 15 at its lower edge. The wire edge 16 is placed inwardly at intervals to provide relatively strong lugs or inwardly extending projections 16 for engagement with the surfaces 8 and 9 of the nozzle.

A suitable liner, of cardboard or other material 17, is inserted in the cap and contacts with the crown portion 5 of the nozzle to form a secure seal.

The cap is applied to the nozzle by causing the projections 16 to register with the recesses 11 in the nozzle and, thereafter, rotating the cap to cause the projections 16 to engage the inclined surfaces 8, which pull the cap tightly down on the nozzle to form a very tight seal between the liner 17 and crown portion 5 of the nozzle. It will be noted that the lower part of the flange of the nozzle adjacent the portions 8 and 9, is substantially larger than the crown part of the nozzle and, thus, creates a leverage on the outer portion of the cap which gives greater flexibility and provides a more uniform seal. This greater flexibility permits the cap to be rotated onto the horizontal surface 9 which, being flat, holds the cap rigidly in position and eliminates any tendency for the cap to fall back. The stops 18 prevent the lugs 16 of the cap from being rotated over the end of the threads.

While the nozzle may be made in any suitable manner, it may be conveniently manufactured by providing a flat blank, substantially circular, and drawing it into a flat-shaped blank. The bottom of the blank is cut out to form the aperture in the nozzle, and the outwardly extending flange is cut to form the recesses 11, inclined surface 8, horizontal surface 9, and stop 10, and thereafter shaped to provide the crown 5, the shoulder 6 and the outwardly extending skirt 17. By reason of the fact that the recesses 11 are cut from the flange prior to the shaping operation, difficulties which would otherwise be encountered in compressing or stretching the metal to shape the nozzle are eliminated. These operations resolve themselves substantially into bending operations, which facilitate the manufacture of the articles.

It will be seen that the present invention provides a construction applicable to tin cans, adapted to form a secure seal which may be opened and closed as often as desired. The shape of the threads is conducive to a tight seal which has no tendency to loosen itself. The recesses facilitate application of the closure cap to the container and, in addition, create flexibility within the nozzle itself, whereby, upon the application of pressure by the lugs of the cap, the engaging portions of the edge of the nozzle are rolled outwardly into locking engagement with the screw cap. In addition, the recesses facilitate the manufacturing operation necessary to form the nozzle. The closure cap operates with the nozzle to form a tight seal and the cap may be removed to remove the portion merging into the other novel features will be apparent from the foregoing description.

As various changes may be made in the form, construction and arrangement of the parts hereinafter departing from the spirit of the invention and without limiting its scope, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a nozzle, the combination of a sheet metal cylindrical portion, an outwardly rolled downwardly extending flange spaced from the exterior of the cylindrical portion, certain portions of said downwardly extending portion being offset outwardly and then downwardly in the form of a cam operating edge, there being intervening unoccupied portions between said certain portions, said unoccupied portions extending into said offset portion to increase the flexibility of the flange.

2. In a nozzle, the combination of a sheet metal cylindrical portion, an outwardly rolled downwardly extending flange spaced from the exterior of the cylindrical portion, certain portions of said downwardly extending portion being offset outwardly then downwardly in the form of a cam operating edge, said cam operating edge having an inclined portion merging into a horizontal portion, there being intervening unoccupied portions between said certain portions, said unoccupied portions extending into said offset portion to increase the flexibility of the flange and to permit the nozzle to compensate for greater irregularities in the cap and nozzle.

3. In a nozzle, the combination of a sheet metal cylindrical member, an outwardly formed downwardly extending flange spaced from the exterior of the cylindrical portion, certain portions of said downwardly extending portion being offset outwardly then downwardly and terminating in a cam operating edge for engagement with a closure cap, there being intervening cutaway portions between said certain portions to form unoccupied spaces, said intervening cutaway portions extending substantially through said offset portion to increase the flexibility of the flange and to permit the nozzle to compensate for greater irregularities in the cap and nozzle.

4. In a nozzle, the combination of a sheet metal cylindrical member, an outwardly formed downwardly extending flange spaced from the exterior of the cylindrical portion, certain portion of said downwardly extending portion being offset outwardly then downwardly and terminating in a cam operating edge for engagement with a closure cap, said cam operating edge having an inclined portion, a horizontal portion and a stop portion, there being intervening cutaway portions between said certain portions to form unoccupied spaces, said intervening cutaway portions extending substantially through said offset portion to increase the flexibility of the flange.

5. In a sealed package, the combination of a sheet metal cylindrical member, an outwardly formed downwardly extending flange spaced from the exterior of the cylindrical portion, certain portions of said downwardly extending portion being offset outwardly into a substantially horizontal portion, then downwardly and terminating in a cam operating edge for engagement with a closure cap, there being intervening cutaway portions between said certain portions to form unoccupied spaces, said intervening cutaway portions extending substantially through the substantially horizontal portion to increase the flexibility of the flange, a closure cap
applied to said nozzle, and a sealing gasket intermediate the cap and nozzle.

6. In a sealed package, the combination of a sheet metal cylindrical portion, an outwardly rolled downwardly extending flange spaced from the exterior of the cylindrical portion, certain portions of said downwardly extending portion being offset outwardly then downwardly in the form of a cam operating edge, there being intervening unoccupied portions between said certain portions, said unoccupied portions extending into said offset portion to increase the flexibility of the flange, and a closure cap applied to the nozzle having a depending skirt telescoped over said flange, said skirt having a hollow roll or bead at the edge thereof, the outer and inner walls of said bead being deformed inwardly to form holding lugs for engagement with said cam edge on the nozzle.

7. In a nozzle for can openings and the like comprising in combination a body part bent outwardly to form a crown sealing surface, said outwardly bent part extending downwardly and being flared outwardly to form an offset or shoulder, the portion below said shoulder being cut to form an inclined surface, said portion also having recesses cut therein extending substantially through said shoulder to facilitate application of the cap and to increase the flexibility of the flange, said inclined portion being adapted to engage the lugs of a closure cap and pull the cap downwardly into sealing relation with the sealing surface of the nozzle.

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