June 8, 1954 W. MACK 2,680,541

RETRACTABLE SPOUT FOR DISPENSING CANS

Filed June 9, 1952 2 Sheets-Sheet 1

FIG. 1

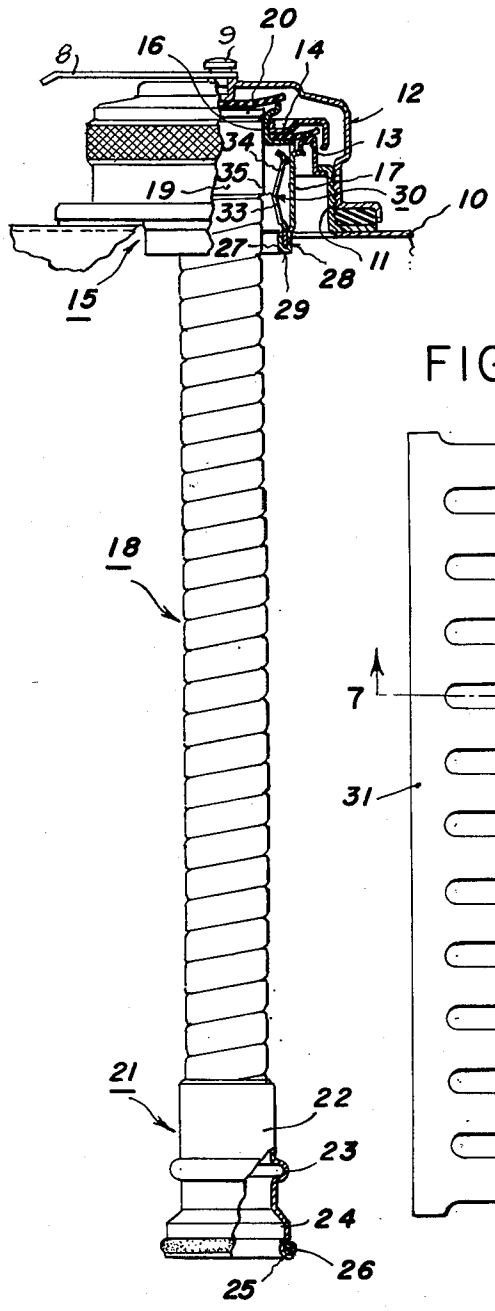


FIG. 2

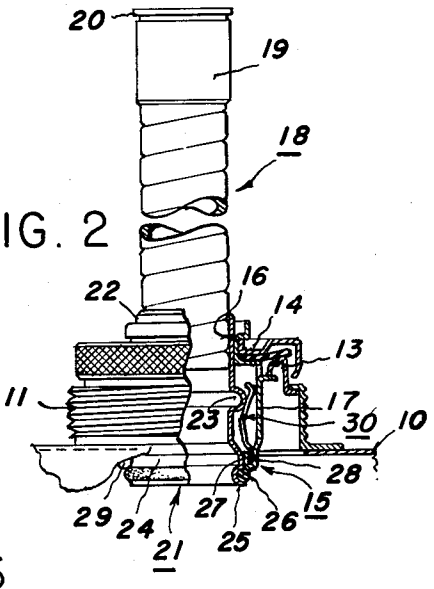


FIG. 6

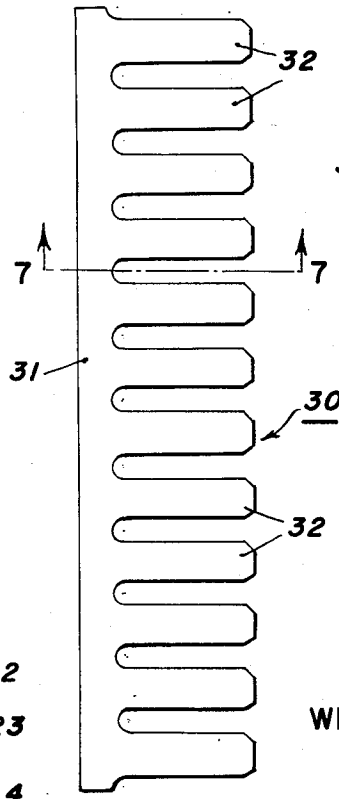
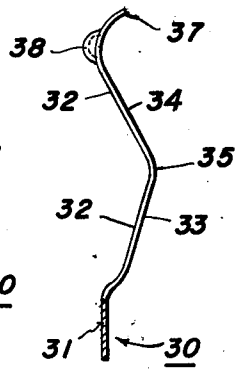


FIG. 7



INVENTOR
WILLIAM MACK,

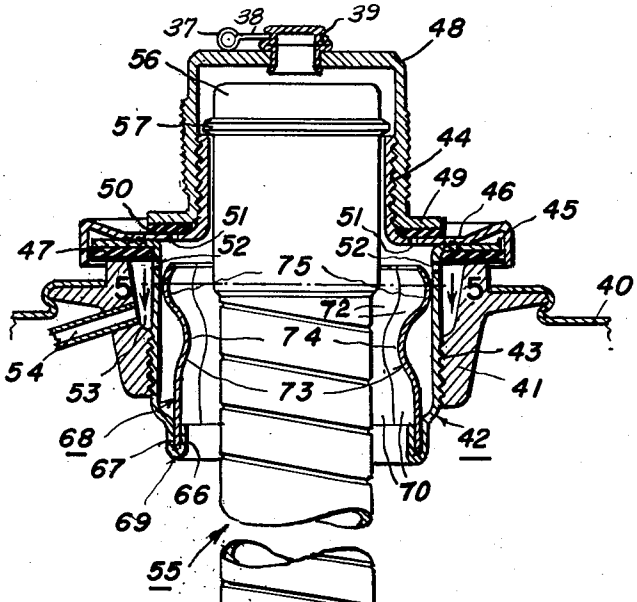
BY W. J. Eccleston,
ATTORNEY

June 8, 1954 W. MACK 2,680,541

RETRACTABLE SPOUT FOR DISPENSING CANS

Filed June 9, 1952 2 Sheets-Sheet 2

FIG. 3



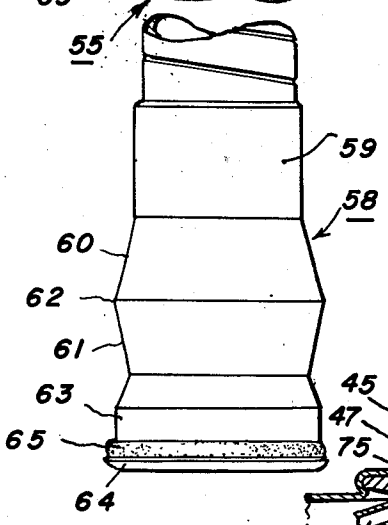


FIG. 4

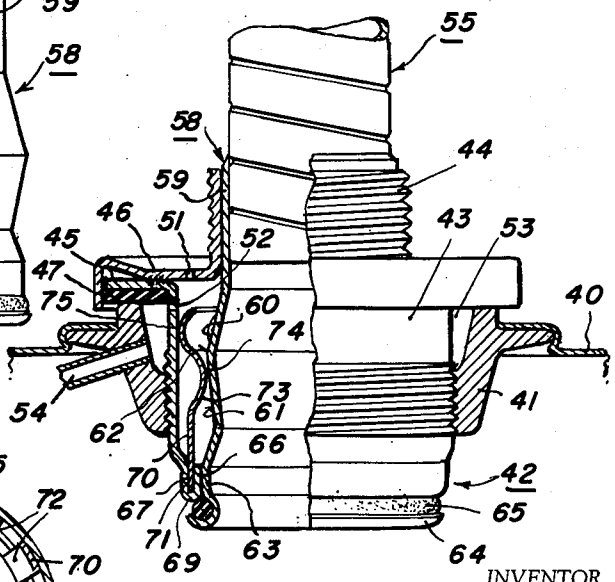
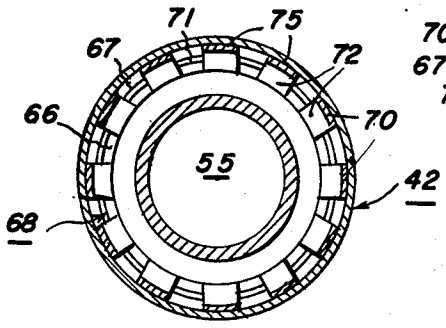


FIG. 5



INVENTOR
WILLIAM MACK,

BY W. J. Eccleston
ATTORNEY

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RETRACTABLE SPOUT FOR DISPENSING CANS

William Mack, Pittsburgh, Pa., assignor to the United States of America as represented by the Secretary of the Army

Application June 9, 1952, Serial No. 292,464

9 Claims. (Cl. 222—526)

1

My invention relates to retractable spouts for dispensing cans or the like of the type wherein a dispensing spout is axially movable relative to the can to and from a retracted or non-use position substantially entirely within the can and an extended or dispensing position substantially entirely outwardly of the can. Specifically, my invention relates to improved means for securing the spout in the dispensing position.

Retractable spouts of the type specified are well known but in many instances are provided with no means for retaining them extended. In other instances, positive locks such as bayonet joints or screw threaded joints are provided for securing the spouts in the dispensing position. The unsecured spouts are obviously undesirable in that partial retraction readily occurs with the result that the can contents leak therefrom about the joint between spout and can. Those spouts which are positively locked in the pouring position are almost equally undesirable as they require that the mating parts be registered before initial engagement can be made and thereafter require considerable time to achieve the final joint. They are, also, relatively slow to uncouple before the spouts can be retracted.

With the foregoing in view, it is an object of my invention to provide improved means for securing a dispensing spout of this type in the dispensing position and which requires only an axially outward pull on the spout to so secure it.

A further object is to provide in such a spout, improved resilient means on one part for engaging keeper means on another part for resiliently locking the spout in the extended position.

A further object is to provide such a spout wherein the resilient means comprises a circumferential arrangement of spring fingers disposed concentrically of the spout.

A further object is to provide such a spout wherein the keeper means comprises a circumferential rib or ridge for engagement with said fingers.

Other objects and advantages reside in the particular structures of the several forms of the invention, the structure of the several elements forming the same, combination and relation of such elements, all of which will be readily understood by those skilled in the art upon reference to the attached drawing in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawing:

Figure 1 is an elevational view of one form of the invention with parts broken away and shown in longitudinal vertical section, the parts being shown in the retracted position;

2

Figure 2 is a view like Figure 1 but showing the parts in the extended position;

Figure 3 is an elevational view of a modified form of the invention, parts being shown in longitudinal vertical section and with parts broken away, the device being shown in the retracted position;

Figure 4 is a view like Figure 3 but shows the device in the extended position;

Figure 5 is a horizontal sectional view taken substantially on the plane of the line 5—5 of Figure 3;

Figure 6 is a plan view of a blank for forming an element of the form of invention of Figures 1 and 2; and

Figure 7 is a transverse sectional view taken substantially on the plane of the line 7—7 of Figure 6 but on a larger scale and showing the finished form of the element.

Referring more specifically to the drawing, wherein like reference characters have been used throughout the several views to designate like parts, and referring at first to the form of invention of Figures 1 and 2, 10 designates a wall of a can or container to which the invention is applied. The wall 10 has secured thereto in any suitable manner any suitable means such as the flange 11 for threadedly securing a suitable closure cap 12 thereto. The cap 12 has a stud 9 secured thereto centrally of the outer surface thereof in any suitable manner. Such stud 9 has an arm 8 pivoted thereto. The outer end, not shown, of arm 8 is intended to be secured in any well known manner to the can wall 10 to anchor the cap 12 against loss. Inwardly of closure cap 12, flange 11 has mounted thereon a cap fitting 13 to which a second closure cap 14 is detachably secured in any suitable manner, such as that disclosed in Figures 5 and 6 of my copending application, Serial No. 292,462, filed June 9, 1952.

The second closure cap 14 is formed with an axial aperture in which is mounted a neck 16 of a can wall fitting 15. Fitting 15 includes an inwardly directed skirt 17 of greater diameter than the neck 16. A dispensing spout 18 is freely slidable in the neck 16 to and from the retracted position of Figure 1 and the extended position of Figure 2.

The spout 18 preferably includes an outer spout fitting 19 which is formed with an outwardly directed annular flange 20 for engagement with the outer edge of neck 16 to limit movement of the spout in a retracting direction to the retracted position. The inner end of the spout 18 is provided with an inner spout fitting 21 which includes a cylindrical portion 22 sized for a sliding fit in the neck 16 of the can fitting 15. A

circumferential rib 23 is formed on the cylindrical portion 22 and in the form illustrated has a rounded free edge. As will appear later, the rib operates as a keeper for securing the spout in the extended position. The free end of the inner spout fitting 21 is outwardly belled to provide a skirt 24, the terminal portion of which is formed to provide a circumferential channel 25 in which is seated a resilient sealing ring or washer 26.

The skirt 17 of the can fitting 15 is formed with its inner edge turned inwardly upon itself as at 27 to provide an axially outwardly directed channel 28 and a rounded inner edge 29 providing a seat for the sealing ring or washer 26. As used herein, the term "axially outwardly" means a direction parallel to the axis of the fitting 15 and towards the outside of the can wall 16. The channel 28 comprises an annular seat for resilient means, generally indicated by 30, for engaging the keeper 23 of the inner spout fitting 21.

The resilient means 30 is best seen in Figures 6 and 7 which illustrate a preferred form of the same. Thus, Figure 6 discloses a comb-shaped blank of resilient sheet material from which the member 30 is formed. Such member basically comprises the base strip 31 and the fingers 32 extending therefrom, preferably in spaced relation to each other. The base strip 31, in use is bent into an annulus and inserted into the channel 28 of the can fitting 15. Thereafter, the base strip may be suitably secured in the channel 28 in any suitable manner, not shown. However, any securing means used should permit ready removal of the spring member 30 so that it can be replaced easily when necessary.

Before the resilient member 30 is applied to the can fitting 15, the fingers 32 thereof are formed to a usable shape best seen in Figure 7. Thus, the fingers 32 are permanently flexed to provide substantially planar cam surfaces 33 and 34 which intersect to provide a relatively sharp ridge 35 extending transversely of each finger. The free end of each finger may be reversely curled as at 37 and the rounded shoe thus formed may be punched out or otherwise provided with a radially outwardly directed boss 38 of reduced area which slidably bears on the inner wall of the skirt 17 of the can fitting 15. Thus, when the finished resilient member 30 is applied to the channel 28, it is apparent that the several spring fingers 32 provide sets of cam surfaces 33, ridges 35 and cam surfaces 34 disposed circumferentially about the spout, and opposing the entrance of the keeper 23 of the inner spout fitting into the can fitting 15.

Obviously, the initial and the majority of the movement of the spout 18 toward the extended position is unopposed by the resilient means 30. However, when the keeper 23 engages the first set of cam surfaces 33 resistance is encountered which must be overcome by the application of sufficient force axially outwardly of the spout to flatten the fingers sufficiently to permit the keeper 23 to pass over the ridges 35 and onto the second set of cam surfaces 34. At such times the fingers become at least partially flexed once more and urge the spout into the fully extended position of Figure 2. Likewise, it should be noted that such second set of cam surfaces 34 not only resiliently hold the spout in the extended position but also resiliently hold the sealing ring or washer 26 into engagement with its seat 29. To move the spout to the retracted position, of course, a reverse operation is involved which initially requires sufficient force to flatten the fingers 32 enough to permit the keeper to be forced past the ridges 35. Thereafter, the spout may be returned to the fully retracted position without substantial resistance.

In the modification of Figures 3, 4 and 5, a can wall 40 has a tubular can fitting 42 mounted therein in any suitable manner as by being threaded into a sput 41 which is mounted in the can wall in a well known manner. The fitting 42 illustrated comprises an inner skirt 43 and an outer neck 44. The neck and skirt are respectively formed with abutting flanges 46 and 45 which are secured together in any suitable and well known manner to form the complete fitting 42. A washer or gasket 47 may be carried by the fitting 42 beneath the flange 45 to seal the joint between such flange and the sput 41. The outer periphery of the neck 44 may be threaded for threadedly engaging a second closure cap 48 which preferably has its free edge formed with an outwardly directed annular flange 49 mounting a sealing washer 50 on the inner surface for sealing the joint between such surface and the outer surface of the flange 46. As in the first described form of the invention, the cap 48 has a stud 39 secured to the cap top centrally thereof. A swivel 36 is pivoted on the stud 39 and has a free end formed to provide an eye 37. The eye 37 is intended to be connected with any suitable flexible tether, not shown, for securing the cap 48 to the can wall 40. It should be noted at this time that the flange 46 is formed with one or more vent ports 51 therethrough which are so located that they are sealed by the washer 50 when the cap 48 is screwed into place but which are uncovered when the cap 48 is removed. Likewise, the skirt 43 is formed with one or more vent ports 52 which open into an annular space 53 formed between the skirt 43 and the sput 41. Also, a vent tube 54 for the can opens into such space 53 through the sput 41, whereby when the parts are in the extended position of Figure 4 with the cap 48 removed, the can is vented while the contents are dispensed.

The spout 55 of this form of the invention preferably includes an upper spout fitting 56 slidable in the neck 44 and formed with any suitable means such as the circumferential rib 57 for engaging the free edge of the neck 44 to limit retractive movement of the spout to the retracted position of Figure 3. The inner end of the spout 55 provides an inner spout fitting 58 having a cylindrical outer portion 59 sized for a sliding fit in neck 44. Axially inwardly of the cylindrical portion 59, the inner spout fitting is formed with two frustro-conical cam surfaces 60 and 61 disposed in base-to-base relation to provide a relatively sharp ridge 62 therebetween. The inner end of the inner spout fitting 58 is belled outwardly to provide a skirt 63 and thereafter outwardly curled as at 64 to provide a circumferential seat for a sealing ring or washer 65.

As in the first described form of the invention, the inner edge of the skirt 43 is formed inwardly on itself as at 66 to provide an annular and axially outwardly directed channel 67 for a resilient member 68 and a doubled free edge 69 providing a seat for the sealing ring 65. The resilient member 68 is preferably generally the same as that of the first described form of the invention in that it may be formed from a comb-shaped blank having a plurality of spring fingers 70 connected together by a base ring 71, Figure 5, which is seated in the channel 67.

However, it is apparent that the form of the fingers 70 is somewhat different in this form of the invention. Here, for instance, each finger is

arcuately flexed to provide successive convex cam surfaces 72 and 73 which merge to provide a convex ridge 74 extending transversely of each finger. The outer or free ends of the fingers 70 may be inwardly curled to provide radially outwardly directed shoes 75 slidably engaging the inner periphery of the skirt 43.

The operation of this form of the invention is essentially the same as that of the first described form except that in this form the ridge 62 and cam surface 61 of the inner spout fitting provides the snap action to urge the spout into the fully extended position after such ridge 62 has passed the ridges 74 of the spring fingers. Here again, the action of the spring fingers 70 is not only to resiliently maintain the spout in the extended position but also load the sealing washer 65 into sealing engagement with seat 69.

It follows from the foregoing, that in both forms of the invention, the spouts are readily secured in the extended position or unlocked for movement into the retracted position by straight-line force on the spout in opposite directions. Likewise, it is obvious that in both forms cam surfaces and spring means load the spouts and their sealing washers into sealing engagement with the cam fittings. Moreover, it is obvious that the particular forms disclosed are but examples of other manifestations of the invention.

Consequently, while I have shown and described what are now thought to be the preferred forms of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structures shown and described hereinabove, except as hereinafter claimed.

I claim:

1. In a retractable spout for a dispensing can or the like, the combination with a can wall having an opening therein through which said spout is slidable to and from an extended dispensing position and a retracted non-use position; of a tubular fitting lining said opening and surrounding said spout in slightly spaced concentric relation, said fitting having a free inner edge formed to provide an axially outwardly directed annular channel, an annulus seated in said channel, a plurality of spaced spring fingers integral with said annulus and extending therefrom substantially parallel to the axis of said spout, said fingers each being formed with an inwardly directed transverse ridge providing oppositely sloping cam surfaces on opposite sides thereof, said spout including an inner end mounting a spout fitting thereon, a radially outwardly directed ridge on said spout fitting providing a keeper, said keeper first engaging one cam surface of each finger as said spout is moved to said extended position and thereafter partially flattening said fingers so as to pass said ridges thereof and seat on the other cam surfaces of the same when said spout reaches said extended position.

2. In a retractable spout for a dispensing can or the like, the combination with a can wall having an opening therein through which said spout is slidable to and from an extended dispensing position and a retracted non-use position; of a tubular fitting, lining said opening and surrounding said spout in slightly spaced concentric relation, said fitting having a portion formed to provide an axially directed annular channel, an annulus seated in said channel, a plurality of spaced spring fingers integral with said annulus and extending therefrom substantially parallel to the axis of said spout, said fingers each being formed

with an inwardly directed transverse ridge providing oppositely sloping cam surfaces on opposite sides thereof, said spout including an inner end mounting a spout fitting thereon, a radially outwardly directed ridge on said spout fitting providing a keeper, said keeper first engaging one cam surface of each finger as said spout is moved to said extended position and thereafter partially flattening said fingers so as to pass said ridges thereof and seat on the other cam surfaces of the same when said spout reaches said extended position.

3. The structure of claim 2, wherein said tubular fitting mounted on said can wall includes an annular gasket seat, an annular gasket carried by said spout fitting, and said gasket sealingly engaging said seat when said spout is in said extended position.

4. The structure of claim 2, wherein said tubular fitting mounted on said can wall includes a free inner edge providing a seat, a resilient sealing gasket carried by said spout fitting, and said gasket resiliently engaging said seat when said spout is in said extended position.

5. The structure of claim 2, wherein said fingers each include a free end, and each free end including a radially outwardly directed boss of reduced area slidably engaging said tubular fitting of said can wall.

6. The structure of claim 2, wherein said outwardly directed keeper means of said spout fitting comprises a pair of frustro-conical cam surfaces disposed in base-to-base relation to provide a circumferential ridge therebetween.

7. In a retractable spout for a dispensing can or the like, the combination with a can wall having an opening therein through which said spout is movable to and from an extended dispensing position and a retracted non-use position; of a tubular fitting lining said opening and surrounding said spout in slightly spaced concentric relation, said spout including an inner end having a spout fitting thereon, a circumferential arrangement of spring fingers carried by one of said fittings concentrically of said spout, an annular keeper on the other fitting concentrically of said spout, said spring fingers and keeper being formed to provide substantially annular and radially oppositely directed ridges concentrically of said spout, one of said ridges comprising substantially intersecting straight surfaces providing a relatively sharp ridge, the other ridge comprising intersecting convex surfaces providing a convex ridge, and said ridge provided by said fingers resiliently engaging over said ridge of said keeper to retain said spout in said extended position.

8. The structure of claim 7, wherein said relatively sharp ridge is provided by intersecting planar cam surfaces formed on each finger.

9. The structure of claim 7, wherein said relatively sharp ridge comprises two frustro-conical cam surfaces of said keeper disposed in base-to-base relation.

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