

June 2, 1959

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2,889,079

ADAPTER AND ADAPTER COMBINATION

Filed Sept. 22, 1955

3 Sheets-Sheet 1

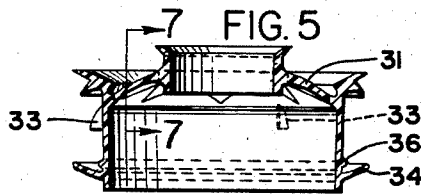
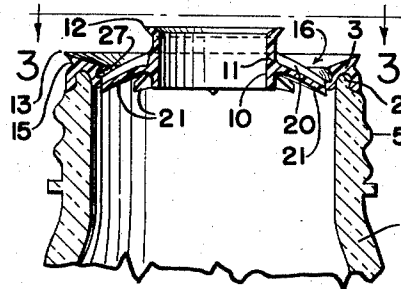
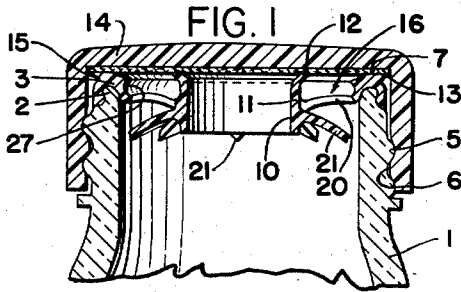


FIG. 2

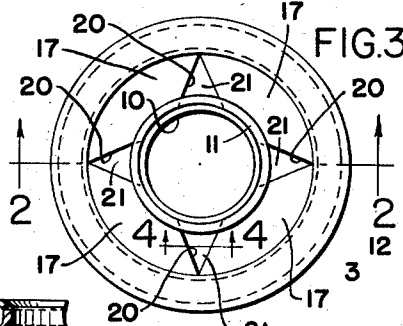


FIG. 3

FIG. 6

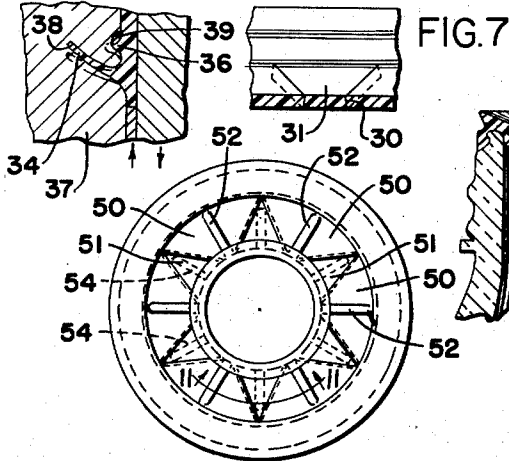


FIG. 7

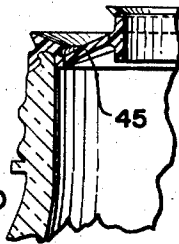


FIG. 8

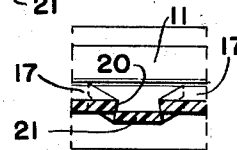


FIG. 4

FIG. 10

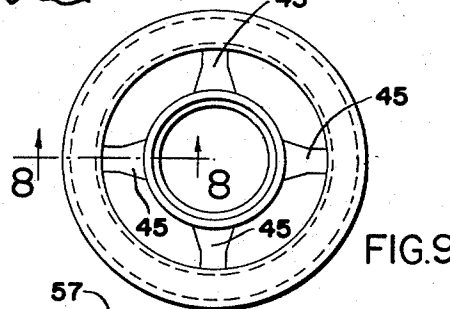


FIG. 9

FIG. 11

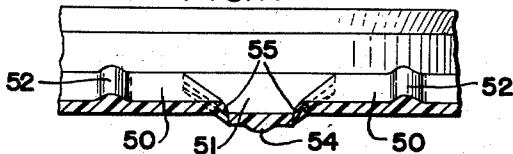


FIG. 13

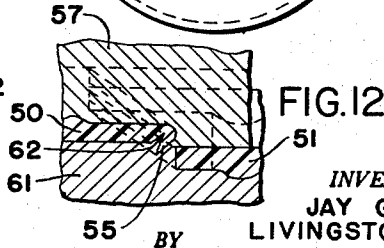
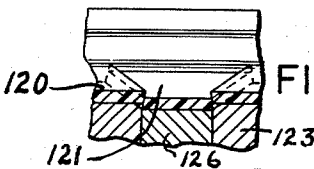


FIG. 12

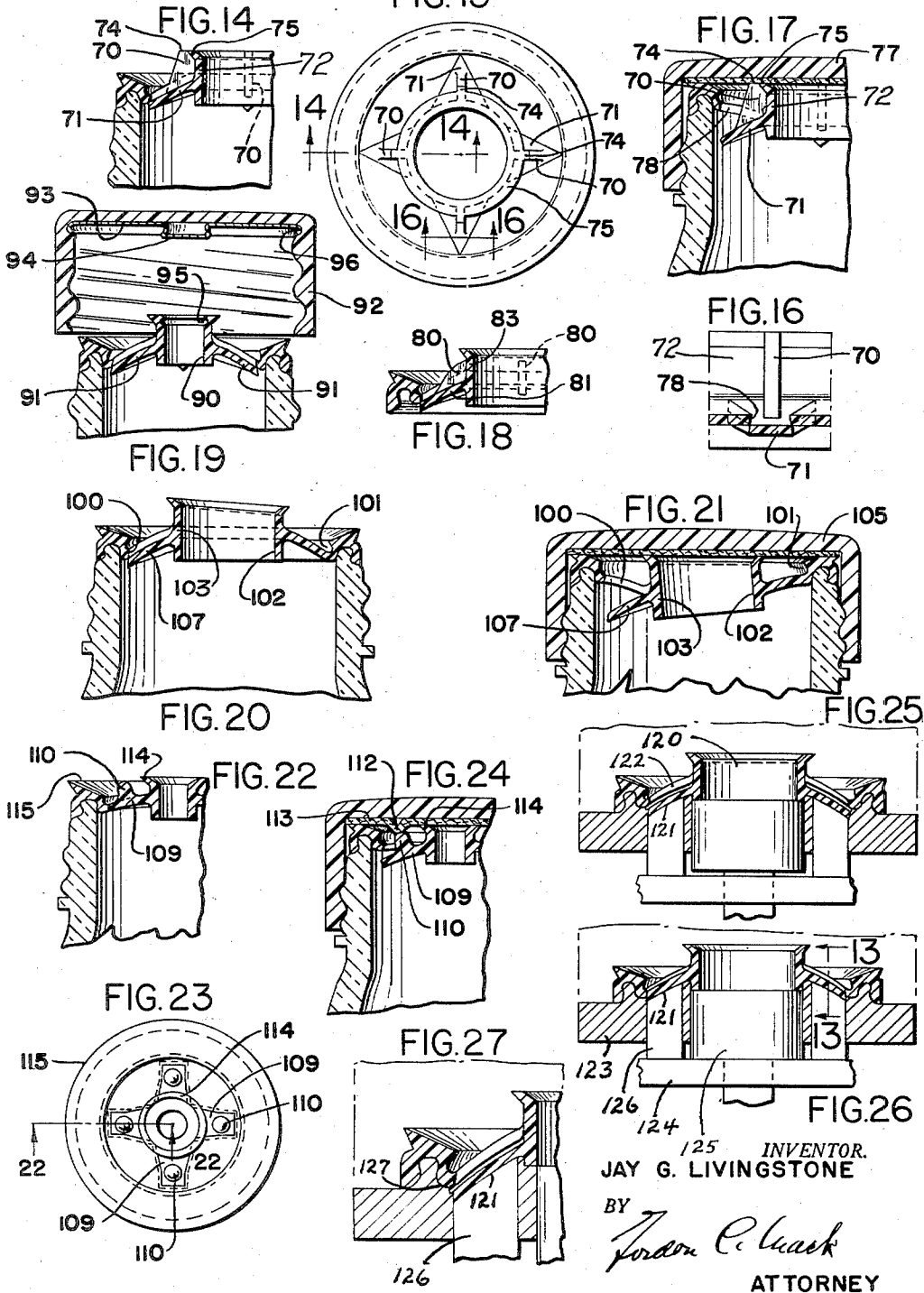
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FIG. 15



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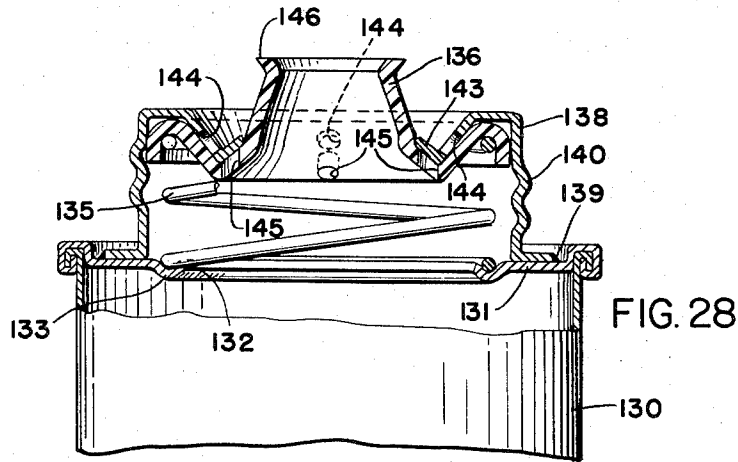


FIG. 28

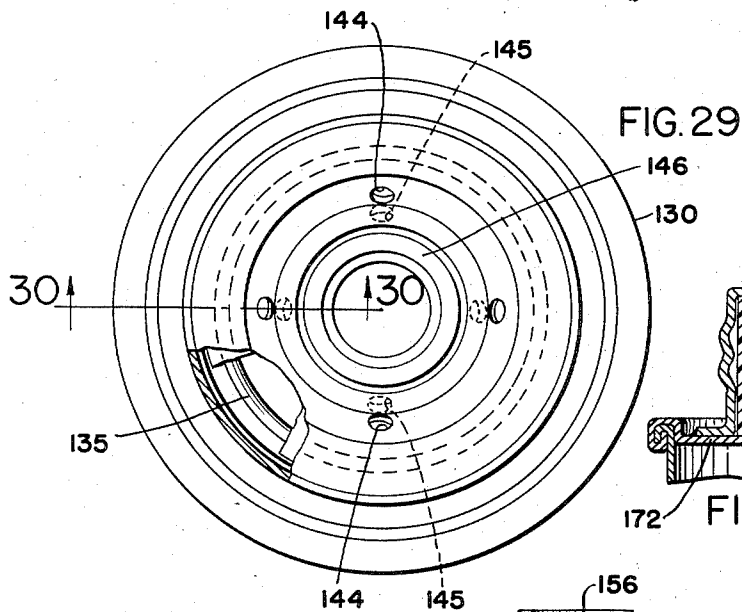


FIG. 29

FIG. 32

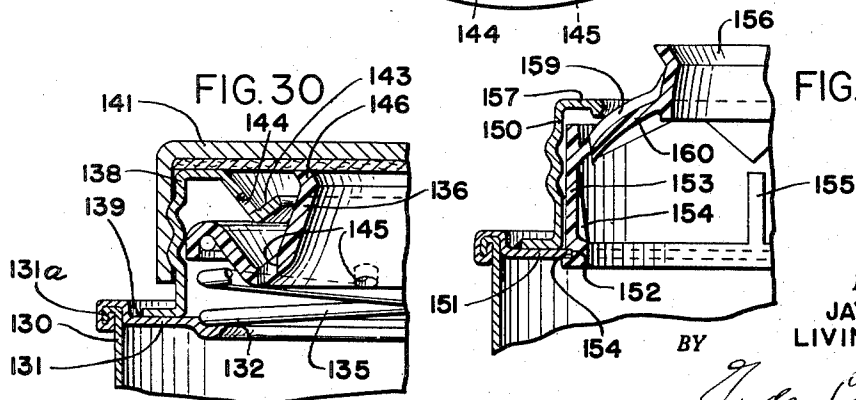


FIG. 30

FIG. 31

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2,889,079

ADAPTER AND ADAPTER COMBINATION

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Application September 22, 1955, Serial No. 535,940

12 Claims. (Cl. 222—109)

This invention relates to an adapter or fitment for liquid-containing bottles and other containers such as tin cans, etc. It is designed more particularly to form a closure in the opening at the outer end of the neck on such a vessel. Ordinarily the opening at the outer end of the neck will be the same size, or substantially the same size as the interior diameter of the neck itself. Usually there will be a single opening through the adapter large enough to serve as a pouring spout. However, the adapter may be provided with one or more small openings and serve as a shaker.

The adapter with a single opening therethrough is the usual form of adapter and it is ordinarily designed with a pouring lip at all sides thereof, so that the pouring opening or spout is symmetrical. However, the adapter may be provided with a single lip located at one side of the spout, or several lips around the spout.

The adapter is provided with a channel between its outer edge and the spout which collects any drip from the pouring lip or lips and liquid which runs down the outside of the spout at the end of a pouring operation. Drainage means is provided in the channel which when closed permits liquid to be poured from the vessel through the spout; and when open causes the liquid which collects in the channel to drain back into the container.

The container is ordinarily provided with a cap which is adapted to cover the pouring opening or spout, and is adapted to be fastened to the container. Usually this cap will be a screw cap. It is usually advantageous to design the adapter so that when a cap of standard design is fastened to the container it depresses the spout and opens the drainage means in the channel so that any liquid which is in the channel drains into the container. A specially designed cap, such as a dome-shaped cap, etc. may be used for the purpose, but is more expensive. The combination of this invention is further designed so that when the cap is removed the spout rises, and the drainage means closes, and liquid may then be poured from the container through the spout as though no drainage means were included in the adapter. The invention includes various devices for accomplishing this result, certain of which are illustrated in the accompanying drawings.

In the drawings—

Fig. 1 is a section through the neck of a bottle or the like with an adapter fastened over the end of the neck and a cap screwed on to the adapter depressing the spout of the adapter;

Fig. 2 is a section through the same combination on the line 2—2 of Fig. 3 but with the cap removed and the spout raised;

Fig. 3 is a plan view of the top of the adapter shown in Fig. 2;

Fig. 4 is a detail of the drainage means in the channel of the adapter, being a section on the line 4—4 of Fig. 3;

Fig. 5 is a plan view of a modified adapter;

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Fig. 6 is a section through the mold used in forming the flange on the adapter of Fig. 5;

Fig. 7 is a section through the drainage means of Fig. 5 on the line 7—7 thereof;

Fig. 8 is a section through a modification of the adapter shown in earlier views;

Fig. 9 is a plan view of the adapter shown in Fig. 8;

Fig. 10 is a plan view of a modified type of adapter;

Fig. 11 is a section through the drainage means, on the line 11—11 of Fig. 10;

Fig. 12 is a section through the mold in which the portion of the adapter shown in Fig. 11 is molded;

Fig. 13 is a section through a modified type of molding means, being a section through the adapter while in the mold, on the line 13—13 of Fig. 26;

Fig. 14 is a section on line 14—14 of Fig. 15, illustrating a still further modification;

Fig. 15 is a plan view of this modification;

Fig. 16 is a section through the drainage means on the line 16—16 of Fig. 15;

Fig. 17 is a section of a bottle equipped with the adapter of Figs. 14—16, with a cap fastened on the bottle depressing the spout of the adapter;

Fig. 18 is a section through a further modification;

Fig. 19 is a section through an adapter on a bottle, and a cap which is specially designed to close the opening in the spout of the adapter;

Fig. 20 is a section through a bottle provided with a modified adapter with a single opening in the channel to constitute the drainage means;

Fig. 21 is a section through the same, but with a cap in place;

Fig. 22 is a section on the line 22—22 of Fig. 23 through a shaker-adapter provided with protruding means for forcing the drainage means open;

Fig. 23 is a plan view of the same;

Fig. 24 is a section through the same with a cap on the bottle which forces the drainage means open;

Figs. 25 and 26 show different stages in the molding operation, the dot-dash lines showing the location of the upper section of the mold which has been removed; Fig. 25 illustrating the arrangement of the adapter and parts of the mold before the start of the ejection operation and Fig. 26 showing the relation of the parts after initial stage of the ejector operation;

Fig. 27 is an enlarged detail of the adapter and mold shown in Fig. 26;

Fig. 28 is a section through an adapter fastened in the opening of a metal can;

Fig. 29 is a plan view of the same;

Fig. 30 is a section on the line 30—30 of Fig. 29 with a cap on the can and the spout depressed;

Fig. 31 is a modified adapter installed in the opening of a metal can; and

Fig. 32 is a section through an alternative can construction.

The figures illustrate various types of adapters, each of which is designed for installation on the neck of a bottle or in the opening of a metal can, or other suitable container. Each is designed to be closed by a cap, the cap generally depressing the spout of the adapter and thereby opening drainage means provided in the channel of the adapter, allowing for drainage of liquid from the channel into the container. Different designs of caps may be employed. They may be hinged, but generally the screw type of cap will be utilized. The cap may be provided with a dome, but preferably is of the standard design with a flat top as illustrated. A gasket will be employed in the cap only when necessary. Ordinarily the cap will be adapted to be fastened to the container so tightly that the use of a gasket is optional, depending upon the type of liquid contained in the vessel. The

gasket may be made of rubber or other plastic where such materials are suitable, as in the packaging of varnishes, etc., lubricating oils, etc. Elsewhere paper or treated paper or the like may be utilized. The adapters may be made of polyethylene or other plastic, the nature of the plastic employed being dependent at least to some extent upon the material being packaged. Polyethylene will generally be a preferred material because it is resilient and elastic, and also is quite inert to chemicals.

The adapters may be used on bottles of different types. They may be attached to the bottle in different ways. Figures 1-4 illustrate an adapter of the snap-on type. The bottle 1 is provided at its upper edge with bead 2 designed to receive the snap-on ring 3 of the adapter. Polyethylene and other plastics are sufficiently resilient and elastic to be used in this manner. Below the bead 2 are the threads 5 on the bottle, onto which the threads of the cap 6 are threaded. Inside the top of the cap is a paper gasket 7 which is suitably adhered to the cap by adhesive.

There is a central opening 10 through the adapter which is bounded by the wall 11. Around the top edge of this wall is the pouring lip 12, forming a spout. Above the snap-on ring 3 the adapter flares outwardly to form a flange 13 having a feather edge which makes sealing contact with the cap 14 when the cap is screwed tightly against it, as illustrated in Fig. 1. The top surface of the flange 13 need not taper continuously upwardly, but in order to obtain sealing contact with the top of the cap or a gasket the outer edge may be flattened (as in Fig. 5) for a distance of, for example, ten to twenty thousandths of an inch. The adapter is undercut at 15, immediately below the flange 13, so that the flange is flexible and will readily form sealing contact when the cap is pressed against it.

Between the spout and the snap-on ring is the channel 16 which is formed of areas 17 attached to both the snap-on ring and the wall 11. There are four triangular openings 20 in the channel which are closed by the closure flaps 21. These closure flaps 21 are fastened only to the wall 11 of the central opening 10.

The flaps 21 are joined to the wall 11 immediately below the plane in which the portions surrounding the openings 20 of the channel are joined to the wall. Thus, as shown in Fig. 4, the flaps 21 are below these portions.

When the cap 14 is screwed on to the top of the bottle, as shown in Fig. 1, the undersurface of its top presses the spout 11 of the adapter down into approximately the same plane as the top of the flange 13. The flange 13 then makes sealing contact with the inner surface of the cap (or the gasket, if there be a gasket). This depresses the whole central portion of the pouring outlet, as is readily seen by a comparison of Figs. 1 and 2. The flaps 21 are fastened only to the wall 11 and they retain their downwardly directed position, as clearly shown in Fig. 1. This depression of the spout opens the openings 20 between the areas 17.

In depressing the pouring outlet or spout, the areas around the openings 20 are placed under strain. The central portion of the adapter might be depressed to a point such that when the cap is removed it would return only slowly to the extended position shown in Fig. 2. By depressing the pouring outlet to a less extent, it returns readily to the position shown in Fig. 2 when the cap is removed.

It will be observed that where the areas 17 join the snap-on ring 3 the inner wall of the adapter is undercut at 27. This forms a well when the vessel is tipped for pouring, and any slight amount of liquid in the channel will be retained in this well during such pouring.

It is readily seen from the foregoing explanation that any liquid dripping from the lip 12 after pouring, and any liquid draining down the outer surface of the wall 11 after pouring will collect in the channel between the cen-

tral opening and the snap-on ring. The well 27 will prevent any slight amount of liquid collecting in this channel from running over the lip 13 when the vessel is tipped for pouring. However, before pouring, the liquid collecting in the channel may be returned to the vessel by depressing the pouring outlet. When the cap is screwed on to the vessel, after use, the pouring outlet is automatically depressed, and any liquid in the channel drains back into the vessel. If the capped vessel is tipped over, liquid running through the spout will be sealed in the cap because of the seal between the flange 13 and the top of the cap. When the vessel is again brought to the upright position, all liquid above the adapter drains down through the openings 20 and returns to the container. It is not necessary to cap the container in order to drain the channel, because depressing the spout manually or by other means drains the channel as effectively as if the container is capped.

In the adapter of Figs. 5 to 7 the sides 30 of the flaps 31 taper upwardly, as do also the sides of the opening, and the flaps fit up into the openings instead of being in a lower plane, all as clearly illustrated in Fig. 7. Instead of being provided at its outer edge with a snap-on ring, this outer edge is adapted to rest on the top of the neck of a bottle or the like.

This adapter of Figs. 5-7 is designed to fit inside of an opening such as the neck of a bottle or the like. It is well known that in molding bottles, the outside diameter of the neck is readily controlled. The inside diameter is less readily controlled, and ordinarily varies over a substantial range, there being only a fixed minimum diameter. The adapter of Figs. 5-7 fits inside the neck of a bottle of uncontrolled diameter. To compensate for the variation in the inside diameter of the neck, several flexible wings or flaps 33 are provided at intervals about the adapter. These press against the inner wall of the bottle neck and tend to center the adapter in the neck. The flange 34 which extends entirely around the wall also is flexible and tends to center the adapter. It likewise serves as a seal preventing liquid flowing into the space between the adapter and the neck of the bottle, above the flange 34, when the bottle is tipped for pouring. The bead 36 gives thickness just above the flange and causes the flange 34 to maintain its upwardly directed position when it is ejected from the mold. The reason for this will now be explained.

During the removal of a thermoplastic adapter from the mold 37, the ejector applies pressure to the bottom edge of the adapter. As the adapter is pushed upwardly, the outer edge of the flange 34 is directed downwardly as it slips out of its molding cavity 38, which is quite narrow. Except for the bead 36, this downward distortion of the flange as it is removed from the cavity would cause the inner circumference to be ruptured and the flange would point downwardly on cooling. Instead of the inner diameter of the flange being ruptured as the adapter is ejected from the mold, the upper surface of the bead 36 in being removed from its cavity 39 (Fig. 6) is ruptured or flattened. This shields, or protects, or prevents the rupture of the flange 34. The shape of the ruptured bead and the angle at which the flange 34 projects from the adapter after removal from the mold are indicated in dot-dash lines in Fig. 6.

In the modification shown in Figs. 8 and 9, the flaps 45 are located in the plane of the channel so that they fill the openings, as shown in Fig. 8. Instead of being pointed, the outer ends of the flaps 45 are blunt, as illustrated in Fig. 9. The angle of their abutment with the attachment ring is substantially perpendicular, as shown in Fig. 8, and so is the angle of their abutment with the sides of the opening.

In the adapter of Fig. 10, the areas 50 between the flaps 51 are provided with stiffening beads 52, and the flaps 51 are provided with similar stiffening beads 54. By beading these various areas the adapter may be made of

thinner plastic than when the beads are omitted and still possess the required stiffness. The edges of the areas 50 at the openings are molded with thin downwardly-turned lips 55 (Fig. 11) which make flexing contact with the flaps 51 as they are closed.

Figure 12 shows a mold for producing the downwardly-turned lips 55. In the mold these lips point sharply outward. After the top core 57 is removed and the adapter is ejected upwardly and separated from the bottom core 61, the pointed bead 62 which separates the lip 55 from the main body 53 of the channel presses the lip inwardly toward the opening. On cooling the lip takes the permanent set shown in Fig. 11, rather than remaining in the position shown in Fig. 12 in which it is molded. The pointed bead 62 tapers downwardly as it approaches the wall of the central opening in the adapter, so that at this wall there is no lip. However, a very short distance from the wall there is a lip which forms sealing contact with the flap.

In the adapter of Figs. 14-17, webs 70 connect the flaps 71 with the wall 72 of the center opening or spout. These webs help to position the flaps and bring them into sealing contact with the edges of openings in the channel when the spout is raised. Because of these webs the flaps, etc. may be made of thinner material than if the webs were absent. Also the tops 74 of the webs extend outwardly under the pouring lip 75 so that when the cap 77 (Fig. 17) is fastened on to the bottle, pressure is applied along the top edge of the web and this pressure is transmitted directly to the flap, giving a positive opening action even though the plastic be quite thin. Likewise the webs prevent the flaps of thin material from sagging unnecessarily as well as insuring that they close the openings 78 when the cap is removed and the spout returns to its raised position.

Figure 18 shows a web 80 of modified design which is of smaller area and is not intended to transmit pressure directly from the cap to the flaps 81. The webs support the flaps from the wall 83 of the spout and insure sealing contact between the flaps and the surrounding areas of the channel when the cap is removed from the vessel.

Figure 19 shows a still further modification in which there is a central outlet 90. Flaps 91 attached to this outlet close drainage openings in the channel when the cap 92 is removed. Inside of the cap is a gasket 93 of stiff impregnated paper. Located centrally of it is the depression 94 which makes sealing contact with the enlargement 95 in the opening at the mouth of the spout when the cap is screwed on the bottle. This not only closes the outlet 90, but also serves to raise this outlet when the cover is removed. Instead of being formed in the gasket, the depression 94 may be formed directly in the cap, in which case the cap will ordinarily be used without a gasket. There is a small groove 96 at the top of the inside of the cap into which the edge of the gasket fits.

The flaps 91 are constructed on a plane below the plane of the channel and lap under the edges of the openings in the channel. This arrangement insures sealing contact of the flaps with the channel when the spout rises and presses the flaps against the openings.

Instead of having drainage openings located in the channel symmetrically around the central opening, one or more openings may be located in a limited area of the channel, and in this case the central opening need not be depressed uniformly when the cap is fastened to the bottle. Such an adapter is illustrated in Figs. 20 and 21. Here there is but a single drainage opening 100 in the channel 101 which surrounds the central opening 102. When the cap 105 (Fig. 21) is fastened on to the bottle it depresses the edge of the wall 103 of the central opening adjacent the drainage opening 100 sufficiently to open the flap 107 of the drainage opening. The portion of the wall 103 which is located away from the drainage opening 100 is not depressed to the same extent.

In order to insure sealing contact between the flap and the edges of the openings in the channel of an adapter when the cap is removed, the flap may be made of relatively stiff plastic. It may be molded so that it is sprung into the wall of the opening and does not begin to open until the central portion of the adapter has been depressed to a considerable extent. To facilitate opening the flaps 109 in the adapter of Figs. 22-24, projections 110 are provided on their upper surfaces. A ring 112 projecting from the undersurface of the cap or formed in the gasket 113 applies pressure to these projections when the cap is fastened in place on the bottle. This provides a positive pressure to open the flaps 109. The top 114 of the spout may be above the flange 115 at the outer edge of the adapter so that when the cap is screwed onto the bottle the spout will be depressed and this will assist in opening the flaps. Alternatively, the top may be no higher than the flange 115 and the opening of the flaps will then depend solely upon the pressure on the projections 110.

The arrangement shown in Figs. 22-24 is particularly suited for shaker-type adapters in which the opening in the spout is generally no more than one-eighth inch in diameter, and may be smaller. The adapters may be made of stiff plastic to insure that the seals between the flaps and the openings are so tight that the flaps are not forced through the openings on shaking.

A modification suggested by the foregoing, which does not require depression of the central portion of the adapter, involves the use of a dome-type cap which permits the spout of the adapter to remain in its extended position above the snap-on ring when the cap is screwed on to the bottle. The undersurface of the cap (or gasket, if used) would be provided with a downwardly depressed ring, such as the ring 112 of Figs. 22-24. The flaps in the channel corresponding to the flaps 109 of Figs. 22-24 would be provided with projections, such as the projections 110, and these would be depressed by contact with the downwardly projecting ring on the inner surface of the cap or gasket as the cap was screwed into place. This would depress the flaps without otherwise altering the relative positions of the other portions of the adapter. When such a cap is removed the flaps would rise, because of the relief of the pressure on the projections 110, and this would close the openings.

Figures 28-31 show two different types of adapters designed especially for use on a metal can. The can 130 has a lid 131 which is crimped to the wall of the can at its outer edge, in the usual manner. There is a large opening 132 in the lid, and a circular indentation 133 adjacent the opening. The coil spring 135 rests in this groove and supports the plastic adapter 136. The neck 138 of the can is welded to the lid 131 at 139 to form the top of the can. The mouth is threaded at 140 to receive the cap 141 (Fig. 30). It extends upwardly and then down inwardly and terminates in a trough 143. There are openings 144 near the bottom of the trough in the metal extension of the neck through which any liquid dripping from the spout or running down the edge of the spout will drain when the spout is depressed. Such liquid will be held in the trough by the plastic spout which is pressed upwardly by the spring. The plastic spout may be depressed either by fastening the cap 141 (Fig. 30) in place or by manually depressing it. When the spout is depressed the liquid drains first through the openings 144 and then through the openings 145 in the plastic spout back into the vessel. The openings 145 and 144 do not coincide, and there is through-passage back into the container only when the plastic spout is depressed and separated from the metal neck. The spout 136 may be provided with one or more pouring lips, but is preferably constructed with an annular lip 146 which makes symmetrical contact with the cap 141 when the cap is put in place.

The plastic adapter is preferably made of polyethylene or other plastic which has sufficient body to depress

the spring, as illustrated in Fig. 30, when pressure is applied to its top edge. It is this depression of the plastic spout which effects the drainage of the entrapped liquid back into the container.

The plastic spout 136 and the spring 135 are preferably assembled into the can cover before the cover is assembled to the body of the can. This is done by inserting them through the opening 132 after the neck 138 has been welded to the lid 131. The plastic spout is flexible and can easily be distorted to pass through this opening. The spring is so constructed that it likewise can be contracted circumferentially so as to pass through the opening. The cover might be inverted and the plastic spout be introduced through the opening and be allowed to rest on the inturned flange 143 of the neck while the spring is put in place. On inversion, the top could then be fastened to the body of the can. There are other types of springs that may be employed, and the general design may be altered without departing from the scope of the claims.

Figure 31 shows a different type of adapter assembled in a metal can. The can has a metal neck 150 welded to the lid 151 around the opening 152. The plastic spout is provided with a substantially vertical wall 153 which is notched at 154 so that it fits over the inwardly projecting edge of the lid at the opening 152. The wall 153 is stiffened by the ribs 155. The wall 153 extends above these ribs and above the height at which the spout 156 is attached to the wall in order to prevent any overflow and collection of liquid in the space between the wall 153 and the metal neck 150 of the vessel. It also limits the extent that the liquid can flow outward when the spout is depressed, because when the spout is flexed downwardly, the top of the wall 153 remains upright. When a cover is screwed on the neck of the can, the top of the spout is depressed much as shown in Fig. 30 so that it is on substantially the same level as the top of the bent-in portion 157 of the neck.

Figures 25 and 26 show a completed adapter in the mold in which it is formed at various steps in the molding operation. Figure 27 is an enlarged detail of a part of Fig. 25. Figure 13 is a section on the line 13—13 of Fig. 26. The adapter 120 is of the type in which the flaps 121 are molded in a plane slightly below the plane of the main body of the channel 122. The body of the mold is continuous from one side of Figs. 25 and 26 to the other side, and is identified by the numeral 123. Two ejectors are shown, 124 and 125. Attached to the ejector plate 124 are uprights 126 which have the same area as the bottoms of the flaps 121 and push against the bottom of the flaps in ejecting the adapter from the mold. The ejector 125 fills the opening inside of the mold 123 up to the upper movable part of the mold. The movable upper portion of the mold forms the upper surface of the adapter and the outer cylindrical wall down to the mold 123, and also forms the inner surface of the outlet of the adapter down to the ejector core 125.

After the completion of the molding operation the upper movable part of the mold is lifted. Then the ejector 124 moves from the position shown in Fig. 25 to the position shown in Fig. 26, raising the uprights 126 against the undersurfaces of the flaps 121, lifting them so that they fill the bottoms of the openings molded in the channel. This is done while the plastic is still warm so that the plastic takes a permanent set. The resulting construction is pictured in Fig. 13. Then the ejectors 124 and 125 move upwardly together, lifting the adapter from the lower portion of the mold 123.

The enlarged detail in Fig. 27 shows the lips 127 which form the outer edges of the openings in the channel as being rounded upwardly. When the uprights 126 move the flaps 121 upwardly they push the flaps against the rounded inner edge of the lip 127, shaping these lips and the edges of the flaps so they conform to one an-

other, so that thereafter the flaps after being depressed will fit tightly in the openings in the channel 122.

The portion 157 of the neck does not dip downwardly as in the neck of Figs. 28-30. Any liquid which drips or drains from the top of the spout will collect against the inner surface of the top of the wall 153. When the spout is depressed, as by fastening the cap in place, openings 159 are opened by the downward movement of the flaps 160 which are attached to the spout. The openings and flaps in the plastic portion of the spout illustrated in Fig. 31 are of much the same design as those illustrated in Figs. 1-4. This plastic spout is readily fastened to the lid of the can before the assembled can top is fastened to the body of the can.

Figure 32 shows an alternative construction in which the vertical wall 170 of the plastic spout 171 is forced into the space between the protruding edge 172 of the lid of the can and the inturned top portion 173 of the neck. The plastic wall 170 is just the length required to have the stiff plastic wall fit snugly between these two end surfaces. The construction of the spout 171 is generally the same as that discussed in connection with Fig. 31.

Any of the adapters shown may be provided with any of the specific flap structures and channel structures, etc. which are illustrated in the several figures, wherever feasible. The various adapters may be provided with snap-on rings or other means of attachment, including that illustrated in Fig. 5. Caps may be used for depressing the spouts of the various adapters whether or not this is mentioned specifically. In the claims where there is no reference to the presence of a gasket in a cap, it is to be understood that a gasket may be used, and where the claim refers to contact between the spout of an adapter and the inside of a cap, it includes such contact with the gasket in the cap. The outer flange of any of the adapters illustrated may taper to be a point, or may have a flat outer edge as illustrated in Fig. 5.

It is also noted that one or more slits or openings or the like may be cut into the plastic of any of these adapters or adapters of different design, as each adapter is put in place on a vessel. This is of particular value when the adapters are placed on the vessels by automatic slitting mechanism, as the equipment may include automatic slitting mechanism. Thus, for example, the flaps 45 of Figs. 8 and 9 may be cut into the channel of the adapter by slitting the plastic with an attachment on the adapter-applying equipment whereby the flaps are formed substantially simultaneously with the application of the adapter to the vessel.

Thus modifications which are illustrated, as well as other modifications, may be incorporated in the adapters of this invention.

What I claim is:

1. A pouring adapter for a bottle or the like which includes means for attachment to a bottle, a pouring spout located interiorly of the attachment means and supported therefrom by a plurality of flexible means so that the spout may be depressed from the position in which it is normally supported, said flexible means having openings therein, and closures somewhat larger than the respective openings, which closures are supported from said spout and are located below the openings and seal the openings when the spout is normally supported by pressing against the edges of the openings from below, said closures being separated from contact with at least a portion of said edges when the spout is depressed.

2. A flexible plastic adapter for a container which is adapted to hold liquid which adapter includes means for attachment to a container, a spout located concentrically thereof with a channel between the spout and attachment means, the spout being supported from said attachment means so that the spout may be depressed from the position in which it is normally supported, the channel being provided with at least one opening which is open when

the spout is depressed, and a flap closure therefor supported solely by the spout which seals the opening when the spout is supported normally.

3. The adapter of claim 2 in which the inner wall of the attachment means is undercut above the bottom of said channel and forms a well which retains liquid collected in the channel when the container is tipped for pouring.

4. In combination a container having a neck with an opening therein, the adapter of claim 2 attached to the neck at the opening, a cap fastened to the neck and covering the opening in the neck and also depressing the spout of the adapter whereby the opening in the channel is opened.

5. In combination a container having a neck with an opening therein, the adapter of claim 2 attached to the container at the opening, a cap screwed on to the exterior of the neck and covering the opening in the neck and also depressing the spout of the adapter whereby the opening in the channel is opened, the spout being adapted to extend to its normal position with the opening in the channel closed when the cap is removed from the container.

6. The adapter of claim 2 in which a web extends between the spout and the closure and maintains the closure in an extended relation with respect to the spout.

7. The adapter of claim 2 in which the closure is stiffened by a rib of plastic molded therein.

8. A flexible plastic adapter for a container adapted to hold a liquid which adapter includes means for attachment of the adapter to the container, a spout located in the adapter inwardly from the attachment means and supported therefrom by a plurality of flexible means so that the spout may be depressed from the position in which it is normally supported, said flexible means being provided with openings therein and closures somewhat larger than the respective openings which closures are supported from said spout by their attachment thereto in a plane lower than the plane of attachment of said flexible supporting means, which closures seal the openings when the spout is normally supported by pressure thereof against the edges of the openings from below, said closures being separated from contact with said edges when the spout is depressed.

9. An adapter for a container adapted to hold liquid which adapter includes a spout, means for the attachment of the adapter to the container, flexible supporting means between the spout and attachment means which holds the spout depressibly extended, said flexible supporting means including a liquid collecting area in which there is an opening, and closure means for the opening supported

solely from the spout in an outwardly extending position which closure means closes the opening when the spout is extended and at least a portion of which separates from the opening when the spout is depressed.

10. An adapter for a container adapted to hold liquid which adapter includes a spout, means for the attachment of the adapted to the container, flexible supporting means between the spout and attachment means which holds the spout depressibly extended, said flexible supporting means including a liquid collecting area in which there is an opening, and closure means supported from the spout below the opening which closure means closes the opening from below when the spout is extended and at least a portion of which closure means separates downwardly from the opening when the spout is depressed.

11. An adapter for a container adapted to hold liquid which adapter includes a spout, means for the attachment of the adapter to the container, flexible supporting means between the spout and attachment means which holds the spout depressibly extended, said flexible supporting means including a liquid collecting area in which there is an opening, and closure means supported from the spout, the sides of the closure means tapering upwardly inwardly and the sides of the opening tapering outwardly downwardly at a complementary angle whereby when the spout is extended the closure means fits into the opening from below and is adapted to be released downwardly when the spout is depressed.

12. An adapter for a container adapted to hold liquid which adapter includes a spout, means for the attachment of the adapter to the container, flexible supporting means between the spout and attachment means which holds the spout depressibly extended, said flexible supporting means including a liquid collecting area in which there is an opening, and closure means supported from the spout and a lip at an edge between the closure means and opening which makes a tight seal therebetween when the spout is extended and is adapted to permit separation between the opening and closure means when the spout is depressed.

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