

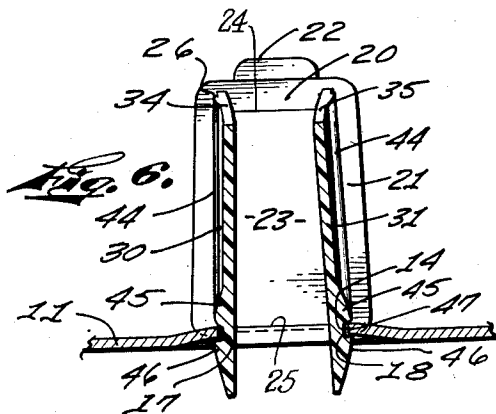
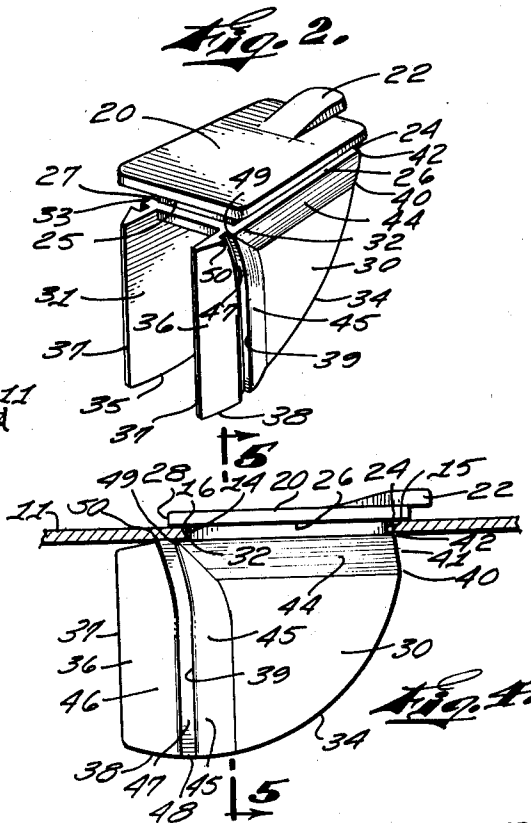
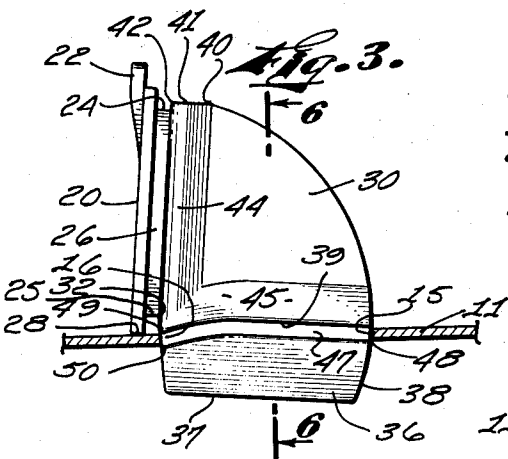
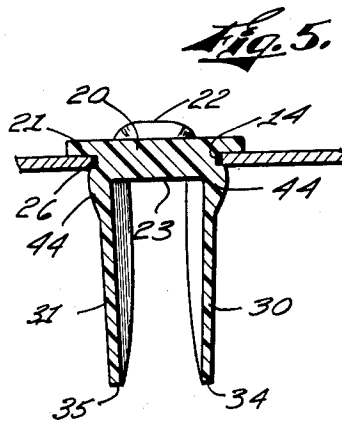
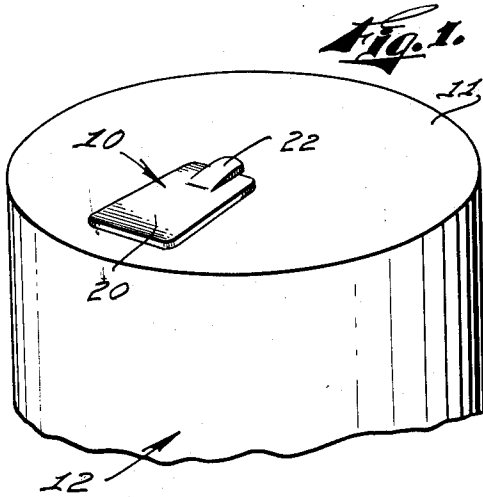
April 30, 1963

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3,087,657

COMBINED SELF-HINGING POURING SPOUT AND CLOSURE

Filed July 1, 1960



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3,087,657  
**COMBINED SELF-HINGING POURING SPOUT  
AND CLOSURE**

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Filed July 1, 1960, Ser. No. 40,462  
3 Claims. (Cl. 222-531)

This invention relates to pouring spouts and more particularly relates to the type of spouts usually associated with cartons of granular materials such as salt cartons, although the invention is not limited to such usage.

The ordinary spout for a cylindrical salt carton is a metal trough having two parallel side walls each having the shape of a 90 degree segment of a circle, joined by a web along one pair of straight sides, the web having a pick-up tab extending radially beyond the curved sides, and a hinge at the right angle of the segment. The web serves as a closure when the spout is pressed into the carton, and the tab and the hinge then prevent the spout from being pressed all the way into the carton.

Such a spout requires a wire hinge which is built into or pivoted upon the carton. The requirement of the hinge necessitates building the spout into the carton at the time and place of manufacturing the carton. Reliance upon the hinge as a support has also resulted in rather loosely fitting a spout into a carton, so that a filled carton leaks when held with the spout-end downward, even when the spout is closed. For this reason it is customary to seal the spout of each carton with a piece of gummed paper when the carton is filled and to be shipped.

It is an object of my invention to provide a pouring spout which is efficient as a closure, thereby eliminating the need of paper seals.

A further object of my invention is to provide a pouring spout requiring no built-in hinge for its efficient operation, but forming its own hinge by its contact with the container.

Still another object of my invention is to provide a pouring spout which is not necessarily installed in a container at the place of manufacture of the container, having no part or element which requires installation while the container is being constructed, but which may be installed in an opening out in the container at some later time and at a more convenient location.

A general object of my invention is to provide an inexpensive one-piece combination pouring spout and closure which can be easily made from either plastic material or metal.

In the accompanying drawing illustrative of a presently preferred embodiment of my invention but not intended to be a limitation thereof, FIG. 1 is a perspective view of my improved combined self-hinging pouring spout and closure installed in closed position in a carton;

FIG. 2 is a perspective view on an enlarged scale of the pouring spout and closure separated from a carton;

FIG. 3 is a side elevational view on a further enlarged scale of the pouring spout and closure in the open, or pouring, position, the carton being shown in section;

FIG. 4 is a side elevational view of the pouring spout and closure in the position of a closure, the carton being shown in section;

FIG. 5 is a vertical sectional view on the line 5-5 of FIG. 4; and

FIG. 6 is a vertical sectional view on the line 6-6 of FIG. 3.

Having reference now to the details of the drawings, my improved combined self-hinging pouring spout and closure is shown in FIGURE 1 at 10, installed in the end wall 11 of a container 12, such as the cylindrical cardboard containers commonly used for salt. The end wall 11 is provided with an opening 14 in which the pouring

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spout and closure 10 is mounted. To provide for a desirable wedge action when the pouring spout and closure is being moved, the opening 14 is preferably made with one end margin 15 a little shorter than the other end margin 16. The side margins 17 and 18 may be substantially straight.

The pouring spout and closure 10 has a closure plate 20 which overlies the opening 14 when in a closing position, having a flange 21 of a greater length and width than the opening and on one end a lifting tab 22. On the underside of the closure plate 20 is a closure insert 23, which is insertable in the opening 14 and fits substantially therewithin. Beneath the flange 21, at the top of the closure insert 23, is a circumferential groove which, for purposes of identification, may be considered as comprising an end groove 24 at the end under the lifting tab 22, an end groove 25 at the opposite end, and side grooves 26 and 27. The closure insert 23 and the grooves 24, 25, 26, 27 are so proportioned that the margins 15, 16, 17 and 18 can fit within the grooves 24, 25, 26, 27 respectively with the closure insert 23 disposed within and below the opening 14. The flange 21 has an end margin 28 which overhangs the groove 25 a distance equal to approximately one and one-half times the thickness of the container wall 11.

Depending from the sides of the closure insert 23, below the side grooves 26 and 27, are arcuate-edged wings 30 and 31 which form the walls between which the spout pours. The wings 30 and 31 each have the general shape of sectors of a circle, of which the centers are approximately at the bottoms of the end groove 25 at the points where the end groove 25 intersects the grooves 26 and 27. From these points as centers designated 32 and 33 for the respective wings 30 and 31, the arcuate edges 34 and 35 of the wings 30 and 31 are determined by radii chosen to be of a length just a little greater than the length of the opening 14 measured along the side margins 17 or 18. The reason for this choice of length will be explained presently.

As the wings 30 and 31 are alike, the following description of the wing 30 will apply also to the wing 31. The wing 30 has an extended portion 36 which projects beyond and below the point 32, having a margin 37 at right angles to the plane of the closure plate 20, and having an arcuate margin 38 in extension of the curve of the arcuate margin 34 beyond the radius line from the point 32 at right angles to the closure plate 20. This radius line, designated as line 39, marks the division between the wing 30 proper and its extended portion 36. On the edge of the wing under the lifting tab 22, the smooth radius-drawn curve of the wing edge 34 terminates at a point 40 a short distance below the end groove 24, the edge of the wing then becoming a secant 41 to the curve and becoming flush with the end of the closure insert 23 which is the lower wall of the end groove 24, the point of intersection of the secant 41 with the closure insert 23 being designated point 42.

Three wedge detents characterize the wing 30 and its extension 36. One wedge detent 44 extends along the top of the wing 30, becoming thicker as it approaches the groove 26 of which it forms the bottom margin. Another wedge detent 45 extends generally at right angles to the wedge detent 44 along the radius line 39, becoming thicker as it approaches the radius line. The third wedge detent 46 is on the extended portion 36, generally parallel to the wedge detent 45 and becomes increasingly thick from the margin 37 towards the wedge detent 45. However the wedge detents 45 and 46 are not contiguous but their most raised portions are separated, forming a groove 47. The groove 47 emerges from the arcuate margin 34 at a point designated as point 48 and has one wall—i.e. the wedge detent 45—disposed along the radius

line 39 for the major part of the distance from the point 48 towards the point 32. As it approaches the point 32, the groove 47 inclines away from the wing 30 toward the extension 36, one wall of the groove terminating at a point 49 beneath the end margin 28 of the closure plate 20, and the other wall terminating at a point 50 spaced from the point 49 at a distance which accords with the thickness of the container wall 11.

The distance from the point 32 to the point 42 is equal to the distance from the point 49 to the point 48, and both distances are selected to be equal to the length of the side margins 17 and 18 of the opening 14. As heretofore stated, the radius from the point 32 to the arcuate edge 34 is a little longer than the length of said side margins. It will therefore be evident that when the spout 10 is shifted from the open position of FIG. 3 to the closed position of FIG. 4, or vice versa, the arcuate edges 34 and 35 will exert a pushing force upon the end margin 15 of the opening 14.

The operation of the pouring spout and closure 10 is as follows. Let it be assumed that the spout is in the closed position of FIG. 4 with the margins 15, 16, 17 and 18 of the opening 14 in the grooves 24, 25, 26, and 27 of the spout and closure. If the lifting tab 22 is lifted, pivoting of the spout begins at point 32, but as the arcuate edges 34 and 35 of full radius begin to press upon the end margin 15 of the opening 14, the pivot point will shift to the point 49. Pivoting ceases when the end 28 of the closure plate 20 makes contact with the carton. In the meantime the carton top has been moved out of the grooves 26 and 27, down the slope of the detents 44, up the slope of the detents 45, and into the grooves 47 between the detents 45 and 46, where it is bent as shown in FIG. 3. The spout is now ready for pouring, with the contents of the carton finding a smooth surface of the closure insert 23 to flow over. When the spout is again moved to the closed position, the pivot point is at first the point 49, and then shifts to the point 32 as the secants 41 enter the carton. Thus, when closure is effected, the opening edges are everywhere contained in the corresponding grooves of the closure, with the closure insert 23 extending through the opening to the interior of the carton, and the closure plate 20 overlying the opening. Under these conditions, the seal, while not air-tight, is effective against loss of granular materials.

To insert the combined spout and closure in a carton, the extensions 36 are pushed into the opening as shown in FIG. 3, until the carton wall 11 is in the grooves. The closure may then be pivoted as above described.

The disclosed embodiment is not to be construed as a limitation upon my invention, the scope of which is deemed to include any desirable constructive modification within the spirit and breadth of the appended claims.

I claim:

1. In combination, a container of bendable material such as cardboard, having a wall opening, said opening having two opposed long sides and two opposed short sides, and a combined spout and closure disposed in said opening, said spout having curved side wings extending through said opening parallel to said long sides, said wings being curved on radii too great to permit said wings to be pivotally swung within said opening on pivot points which are the center of said radii, and extensions of said wings affording additional pivot points on which said wings may swing when unable to swing on said radii centers, said spout having a closure plate overhanging said wings, and grooves between said plate and said wings for receiving the margins of said opening, and additional grooves on the outer side of each of said wings

extending from the curved edge of said wings toward said plate along the radii of said wings perpendicular to said plate until close to said first-mentioned grooves and then being bent to extend along said extensions to positions aligned with the adjacent margin of said plate, said positions and said additional pivot points coinciding.

2. A combination pouring spout and closure for a container having an opening comprising a closure plate, a closure insert of less length and width than said closure plate on the bottom side of said closure plate so as to fit within said opening, wings extending downwardly from opposite sides of said closure insert having raised portions adjacent said closure insert so as to form grooves between said wings and said closure plate of which grooves said closure insert forms the bottom, said wings having extensions at one end of said closure plate extending beyond said closure plate, said wings and said extensions defining additional grooves in general perpendicular to said end of said closure plate, but inclined away from said wings so as to terminate under said one end of said closure plate, said wings and said extensions being curved on curves of which the walls of said additional grooves adjacent said wings are the radii, said wings being cut back from said curves adjacent the other end of said closure plate so as to have less radius than the downward extending portions of said wings.

3. In combination, a container of bendable material having a wall opening, said opening having two opposed long sides and two opposed short sides and a combined spout and closure disposed in said opening, said spout being capable of being moved between open and closed positions, said spout including a closure plate having long sides located adjacent to and spaced from the long sides of said opening in said closed position and having front and rear edges connecting said long sides and located adjacent to and spaced from said opposed short sides of said opening in said closed position, said closure plate resting against the outside of said container and covering said opening in said closed position, said spout having grooves formed on the underside of said closure plate so as to extend around the underside of said closure plate, said grooves being inwardly spaced from the edges of said closure plate and being dimensioned so that the lengths of said grooves receive the entire lengths of the corresponding sides of said opening, said grooves contacting adjacent sides of said opening when said spout is in a closed position, said spout having wings located so as to extend generally parallel to one another from said closure plate through said opening adjacent to the long sides of said opening, each of said wings having an edge curved from adjacent to the front edge of said closure plate to a point generally beneath the rear edge of said closure plate so as to permit said spout to be rotated to said open position about an axis of rotation defined by said rear edge of said closure plate, said rear edge of said closure plate engaging said container during the rotation of said spout from said closed to said open position, said closure plate extending generally perpendicular to said wall opening in said open position.

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