May 5, 1964 A. E. DESMOND 3,131,847

POURING SPOUT CONSTRUCTION

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Fig. 1

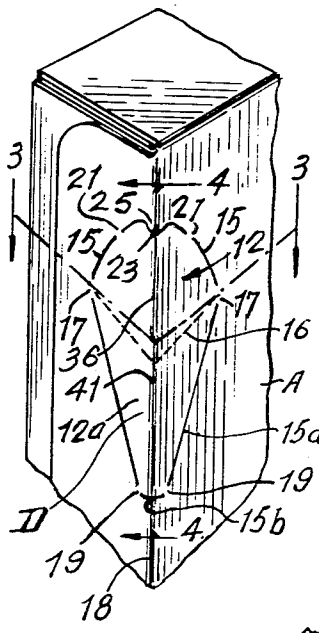


Fig. 2

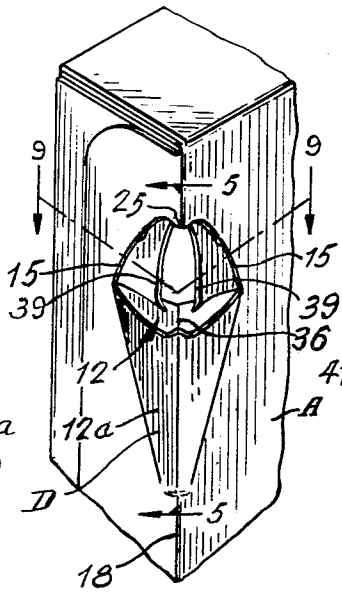


Fig. 4

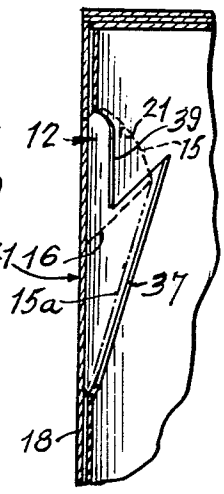


Fig. 3

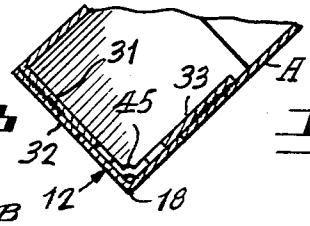
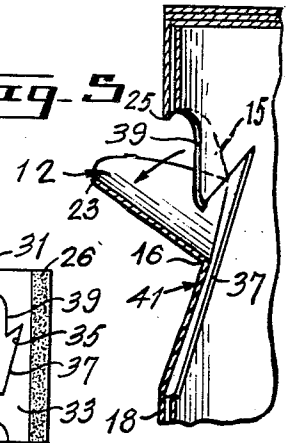


Fig. 5



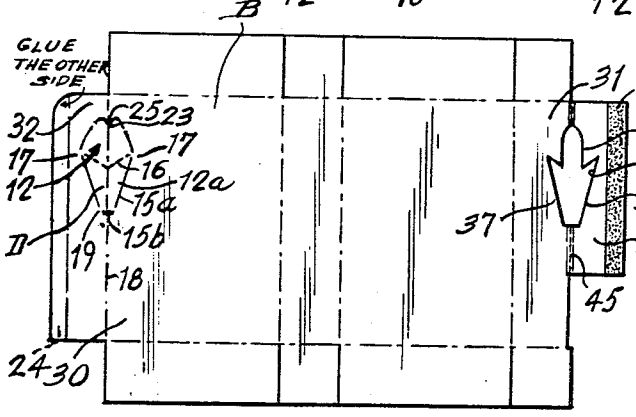


Fig. 6

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Fig. 7

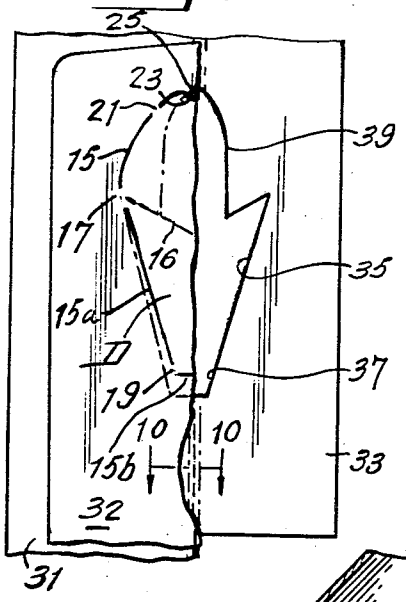
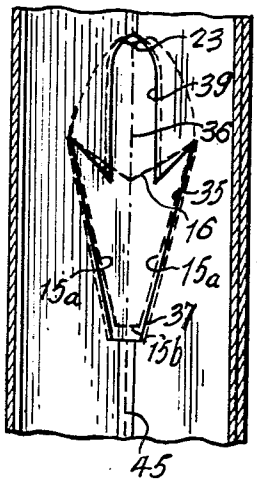


Fig. 8



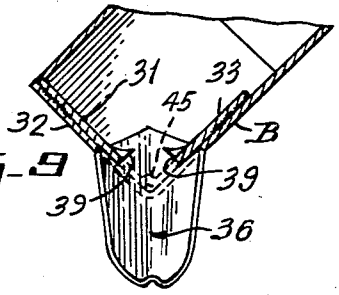


Fig. 9

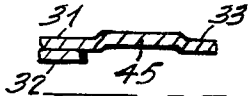


Fig. 10

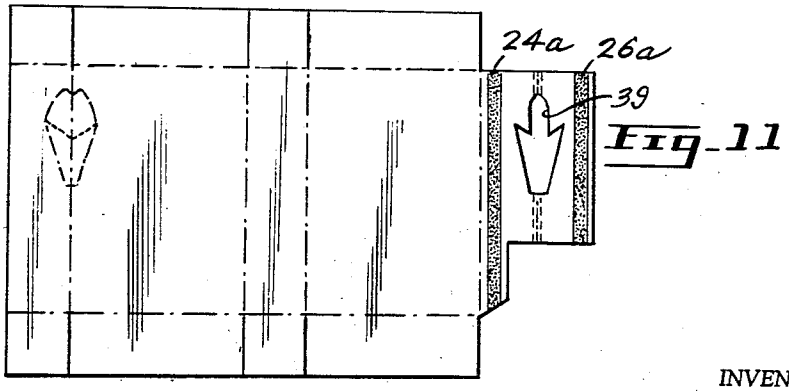


Fig. 11

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POURING SPOUT CONSTRUCTION

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9 Claims. (Cl. 229—17)

The present invention relates to improvements in the manufacture of dispensing containers.

More specifically, the type of container to which the invention relates has a potential spout formed in a deformable portion of the container walls at a corner with crease lines, score lines, perforated lines, or slits, as the case may be, to define an upper spout panel and a lower trigger panel connected to it by a creased or perforated line. Inward pressure on the lower or trigger panel deforms the deformable part causing the upper or spout panel to pop out. Return of the spout panel to its initial position is effected by an upward and inward push on the spout panel. The problem with this type of container is that when the trigger panel is pushed in, the retaining walls are usually, on initial use, not rigid enough to resist being pushed inward, thus to allow the panel to hinge cleanly about the score or crease line connecting it to the wall proper of the container. A further problem, during the first few times of use, is that the spout panel does not snap back sharply, its upper edge getting caught against the carton corner. Hence, containers of this general type, tend to be "temperamental" on initial use.

The present invention aims to provide an improved pop-out pouring spout construction which can be readily embodied in a cardboard or paperboard container having at least one angular corner, and which are not "temperamental" on initial use, and will work from the word "go."

Because of the normal resiliency of paperboard and the tendency to resist deformation, the mere scoring and slitting of the container walls of a blank is not, of itself, adequate to provide for perfect functioning. The applicant has found that a number of subsidiary features which may appear small, in themselves, are required before the device functions perfectly. Likewise, once the deformable section has been pushed in to pop out the spout, the return of the pop-out section to closed position is also fraught with problems inherent in the use of paperboard, where hinging is not exact and the normal resilience of the material sometimes causes moveable parts to jam with rigid parts and prevents the moveable parts from returning smoothly into place.

In accordance with a preferred embodiment of the invention, this is accomplished by defining, in the box blank, at the intersection of a corner fold, a deformable section having as its central axis the aforesaid corner fold line. The deformable portion is divided interiorly into a pop-out spout panel and a push-in trigger panel, by a transverse fold line having its apex located on the corner fold line and extending from the corner fold line to meet the side apices of the deformable section. Inward pressure applied to the lower or trigger panel will cause the upper spout panel to pop-out providing a dispensing opening and a spout leading therefrom.

To close the dispensing opening a slight push on the pouring spout inwardly towards the container corner causes it to snap back, due to the natural resilience of the material. In a preferred construction, the top of the spout panel is provided with a recess and a mating projection is provided on the rigid container wall corner. This construction promotes return of the spout part.

The deformable portion is preferably formed on one corner of the carton where the manufacturing joint is made, with provision made in the carton blank in the form of overlapping tabs so that there is a two ply thickness at that corner. The inner or lining ply is cut out

to have an opening bordered by margins which almost register with the outline of the deformable portion. At the top part of the said lining opening, the margins extend beyond the die-cut portions of the spout panel, to provide a protective and flow-controlling lip with free inner lower portions which bear resiliently against the inner surface of the spout panel when it is in operative position. At the bottom part, the margins of the opening stop short of the hinge lines of the lower trigger panel to assist in their hinging cleanly, by resisting the inward pressure which is exerted on the trigger panel.

This application is a continuation-in-part of United States application Serial No. 155,779—filed November 29, 1961 now abandoned.

Having thus generally described the nature of the invention, particular reference will be made to the accompanying drawings showing by way of illustration, preferred container constructions embodying integral pouring spouts in accordance with the invention, and in which;

FIGURE 1 is a fragmentary view in perspective elevation of one end of a cardboard container embodying a dispensing pouring spout, in accordance with the invention, with the spout in closed condition.

FIGURE 2 is a fragmentary view in perspective elevation of the complete container, partially shown in FIGURE 1, with the pouring spout popped out into dispensing position.

FIGURE 3 is a cross-section along the line 3—3 of FIGURE 1 showing the overlapping double-ply arrangement at that point.

FIGURE 4 is a cross-section taken on FIGURE 1 through the corner, at a 45° angle to the side walls.

FIGURE 5 is the same section as FIGURE 4 but taken on FIGURE 2.

FIGURE 6 is a plan view, showing a preferred blank suitable for making a container according to the invention, particularly indicating the preferred positions of the glue.

FIGURE 7 is a fragmentary plan view of a container according to the invention, in flattened out position with the upper panel cut away along the fold line to show the overlapped under-ply, illustrating particularly the relationship of the two cooperating plies adjacent to the deformable part.

FIGURE 8 is a vertical cross-section looking from the inside of the container at the corner part in which the deformable portion is located to show relationship of inner and outer ply outlines.

FIGURE 9 is a cross-section along the line 9—9 of FIGURE 2 showing the resilient action of the inner ply against the pouring spout panel when in open position.

FIGURE 10 is a cross-section along the line 10—10 of FIGURE 7.

FIGURE 11 is a plan view of an alternative form of blank according to the invention, the distinction over that of FIGURE 6 being essentially in the gluing flap.

With particular reference to the drawings, A designates a paperboard container having a deformable section D including a spout panel 12 and a trigger panel 12*a*, operable so that an inward push on the trigger panel pops out the spout panel. The deformable section D is placed in one angular corner of the container. This deformable section D is made, according to the preferred form illustrated, by defining in the blank B by the usual cutting, creasing or scoring dies, a substantially "kite-shaped" section as shown in FIGURE 6. A V-fold line 16 divides the deformable section D into the upper spout panel 12 and the lower trigger panel 12*a*. The major axis of the section D is located on the corner fold line 18 of the blank B. The apex of the V-shaped fold line 16 is also located on this line.

The upper or spout part 12 of the section D is defined

by slits 15 preferably with narrow uncut portions or bridges 21, where required, to hold the cut out spout part 12 in place until popped out. The lower or trigger part 12*a* is defined by scores or creases 15*a* constituting hinges. The slits 15 and the scores 15*a* stop short of their projected geometrical intersection to provide an unweakened ligament 17 linking the part 12 and 12*a* and the panels 30 and 32. The scores or creases 15*a* thus preferably do not meet the container fold line 18 but stop short of this line to avoid weakening or breaking the container corner when it is flexed inwardly as will be described. Preferably a cross score 15*b* is provided, slightly separated by unscored ligaments 19 from the hinge lines 15*a* at the bottom. This construction serves to facilitate a clean hinging of the trigger panel 12*a*.

The top of the spout panel 12 is provided with a recess 23. A complementary projection 25 is provided in the corner of an underlying ply forming a backing for a more rigid part of the container wall for purposes to be described.

The container is formed so that the push-in-pop-out section is reinforced by the following preferred double-ply construction. The container blank, as shown in FIGURE 6, is provided with an end panel 31 having an extension or tab 33 which, when the blank is glued and folded, underlie the end panel 32 and side panel 30, respectively.

There are glue lines 24 and 26 provided on the rear face of the panel 32 and the front face of the tab 33, as shown in FIGURE 6. When the carton is assembled, the end panel 32 and the side panel 30 are placed in overlapping relationship to the end panel 31 and tab 33 so that these glue lines fall on either side of the deformable section D. This overlapping double-ply construction gives rigidity around the deformable section D and tends to anchor in place the surrounding walls adjacent to the weakened portions assisting in giving a smooth pop-out action, particularly on the initial popping out of the spout.

An alternative construction is shown in FIGURE 11. This shows another positioning of glue-lines 24*a* and 26*a* in the blank. Essentially the same advantages are achieved, as with the construction shown in FIGURE 6 and described above, but the gluing operation would be modified.

The combined end panel 31 and tab 33 are provided with an opening 35 of substantially the same shape as the deformable section D, except that this opening is of a different size. The lower part of the opening 35 is a little larger than the push-in-pop-out section D, so that lower margins 37 of the opening fall just short of the fold-lines 15*a*. The upper part of the opening 35 has margins which project beyond the score lines 15 and constitute flexible lips 39 which prevent sifting out of contents and control the flow of material coming out of the opening, and also serve to direct the spout panel 12, as it is popped out, by resiliently bearing on the inside of the spout panel 12 and holding it down as its lower part moves in. This facilitates the pop-out action and also the return closing action.

The particular construction described above is a preferred one. In some instances, however, the nature of the lips 39 may be modified. For example, these lips may barely project beyond the outer panels 31 and 33, in which case, they merely provide reinforcement behind the slits 15. They could, under certain circumstances, be flush with the edge of the panels 31 and 33 at the slits 15. This construction could be used, for instance, where nature of the material packaged requires a relatively large opening for dispensing and does not require the control of projecting lips.

Operation

In normal closed position, with a filled container, the deformable section D is as shown in FIGURE 1. The score-slit 15 is covered on the inside by the lips 39, so as to prevent sifting out of the contents.

The dispensing spout is popped out by a thumb pressure on the spot 41 of the trigger part 12*a*. This brings about inward hinging of this part about the hinge lines 15*a* and outward hinging of the spout part 12 about the hinge line 16. The leverage on the lower end of the spout part along the line 16, is enough to cause immediate rupture of the bridges 21, where used, and the parting of the spout part 12 from the side walls 30–32 along the slits 15, until the spout pops out to the position shown in FIGURE 2. The popping out of the spout is assisted by pressure on its inside by the lower part of the lips 39. The cross-score 15*b* is of assistance in assuring a clean break in the inward hinging of the trigger part 12*a*, near the bottom of the score lines 15*a*. The ligaments 17 and 19 function as "bearings" about which the hinge lines 15*a*, 15*b*, and 16 "rotate."

When it is desired to close the container again, it is only necessary to snap the spout back into place, which only requires light finger pressure on the spout part 12, the natural resilience of the paperboard doing the rest, after the spout has been popped out once or twice. The return into register of the edges of the spout part 12*a* with the contiguous edges of the rigid walls 30—32 of the container, is facilitated by the depression 23. The applicant has found that there is a tendency for the depression 23 to ride under the projection 25, rather than bump up against the projection, as occurs when it is the spout portion which projects, rather than the rigid portion of the container.

In an alternative construction, the center line of the spout portion as at 36 may be partly scored. This partial scoring helps to prevent the tendency of the spout part 12 to bulge away from the contiguous walls 30—32, when the glued and folded carton is set up prior to filling.

Another feature which contributed to the perfect functioning of the applicant's container, is the fold or hinge line 45, made up of two creases with a perforation rule between. This causes the formation shown best enlarged, and in the flat in FIGURE 10, and in erected position, at FIGURE 3. When the container is folded, the inner end panel 31 and tab 33 are overlapped and glued to the end panel 32 and side panel 30 respectively. When the carton is assembled flatly prior to opening for filling, the overlapped inner panel and tab 31 and 33 are the same length as the corresponding portions 32 and 30 of the outer panels. Accordingly when bent at right angles there is excess board at the fold line of the inner plies (panel 31 and tab 33) which naturally cause buckling. The purpose of the double creases and perforation rule is to cause this buckling to take place in a regulated manner, that is to form an inwardly arched curved portion 45, as shown in FIGURE 3. This minimizes the tendency of the outer plies (panels 32 and 30) to crack at the corner of the carton.

I claim:

1. A paperboard carton having a symmetrical deformable section formed on two walls thereof which meet at a corner, said deformable section comprising a reclosable upper spout panel and a lower trigger panel, the spout panel being separable from said walls by slits along its margins to provide a pouring opening, the trigger panel being hingedly connected to said walls by hinge lines, and hingedly connected to the spout panel along a V-hinge line extending from the margins of the deformable section and having its apex on the corner of the carton, whereby inward deforming pressure on said trigger panel acts to extend said spout panel in substantially V-shaped formation outwardly from said adjoining walls to define said pouring opening, a paperboard lining adhesively attached juxtaposed to the portion of the walls of the carton in the area of said deformable section and having marginal portions underlying said walls just outside the said hinge lines of the trigger panel and other marginal por-

tions jutting beneath and beyond the slits defining the spout panel thereby to provide lips limiting the said pouring opening and to brace the walls in that area against inward pressure on said trigger panel.

2. A carton, as defined in claim 1, wherein said lips have flexible parts which project into the said pouring opening in a position to bear on the inside of the spout panel when the bottom of said panel is forced in an inward direction, thereby to assist the outward movement of said spout panel.

3. A carton, as defined in claim 1, in which said carton is made of a one piece blank and a manufacturing joint is formed adjacent the corner at which the deformable section is located and the said lining is a glued overlapping portion of said blank.

4. A container, as defined in claim 1, in which said lining is provided with a wide flexible fold line adapted to register with the corner of the container bearing said deformable section providing a regulated inward buckle at this portion.

5. A paperboard carton having a symmetrical deformable section formed on two walls thereof which meet at a corner, said deformable section comprising a reclosable upper spout panel and a lower trigger panel, the spout panel being separated from the walls by slits along its margins to provide a pouring opening, the trigger panel being hingedly connected to said walls by score lines and hingedly connected to the spout panel along a V-line extending from the margins of the deformable section and having its apex on the corner of the carton, the fold lines each terminating just short of the adjacent slit, and the V-line terminating just short of the adjacent fold line and slit whereby there is provided between the fold line, slit and V-line an unscored ligament connecting the spout panel, trigger panel and wall of the carton, whereby inward deforming pressure on said trigger panel acts to extend said spout panel in substantially V-shaped formation outwardly from said adjoining walls to define said pouring opening, an internal reinforcement behind said deformable section having portions bordering an opening in register with said deformable section, the said reinforcement portions underlying said upper spout panel extending beyond said panel defining slits, with the reinforecement portions underlying said trigger panel terminating short of said panel defining score lines.

6. A blank for forming a paperboard carton having a reclosable pop-out spout, comprising, a first panel adapted to form at least part of a wall of a container, a second panel joined to the first by a score line and adapted to form an adjoining wall at a common corner with the first panel, third and fourth panels adapted to be juxtaposed to said first and second panels respectively in the folded and glued container, symmetrically arranged on the common marginal areas of the first and second panels a symmetrical deformable section, converging slits defining in said section a pop-out spout panel and converging score lines, a trigger panel and a V-fold line connecting the said spout and trigger panels, said third and fourth panels having symmetrically related to their common marginal areas an opening of roughly the same shape as the outline of the deformable section and adapted to register therewith, said opening being slightly larger than the deformable section in a first part adapted to register with the trigger panel and somewhat smaller than the deformable section in a second part adapted to register with the spout panel, whereby when the opening is superimposed on the deformable section in folding and gluing the carton the walls outside the fold lines of the deformable section are braced by the lining first part and the lining second part projects beyond the slits defining the spout panel to provide projecting lips defining the dispensing opening, and adapted to restrict the inward movement of said spout panel.

7. A blank, as defined in claim 6, in which the fold line between the third and fourth panels is made up of two creases intervened by a perforation thereby to provide for regular buckling.

8. A blank, as defined in claim 6, in which the marginal slits of the spout panel in which the lower ends of the margin slits of the spout panel, the upper ends of the margin score lines of the trigger panel and the outer ends of the V-line stop short of each other in an unscored ligament.

9. A blank, as defined in claim 6, in which the slit defining the spout panel extends inwards at the nose of the spout panel to provide an indentation at the spout panel and a corresponding projection on the adjoining portions of the panels.

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