

FIG. 1

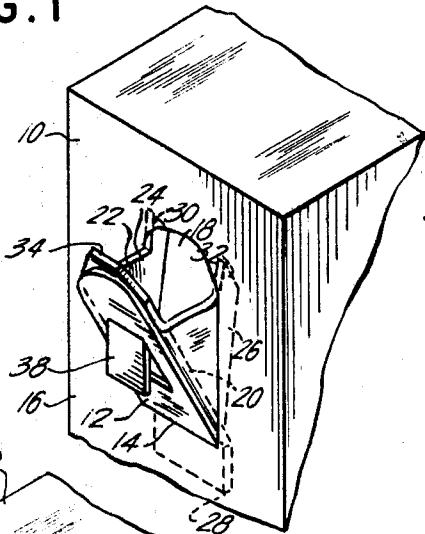


FIG. 2

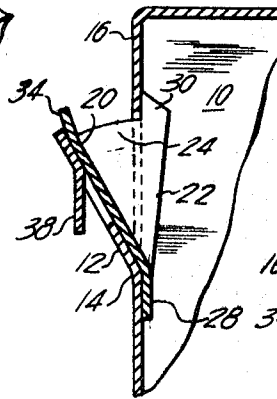


FIG. 3

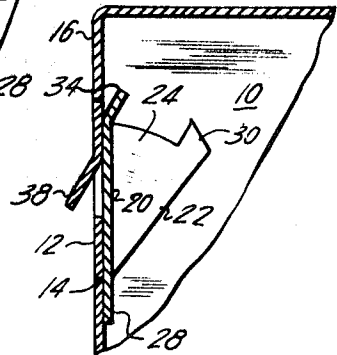


FIG. 4

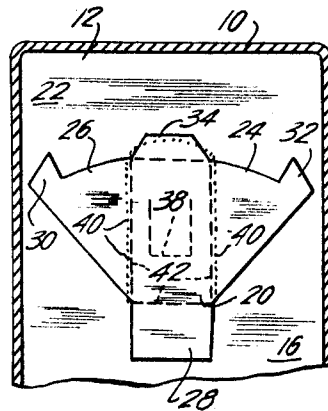
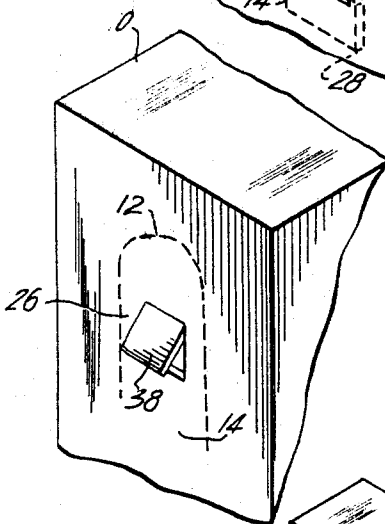


FIG. 5

FOLDING APPARATUS

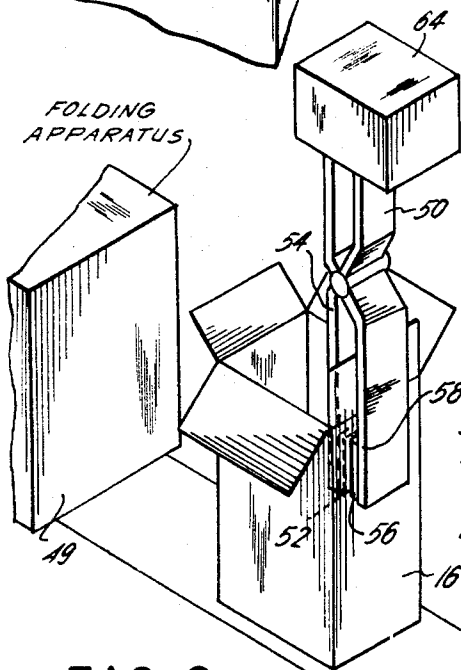
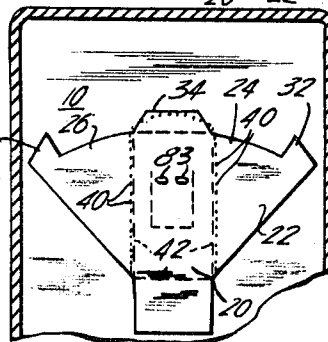


FIG. 6

FIG. 10



FIG. 11



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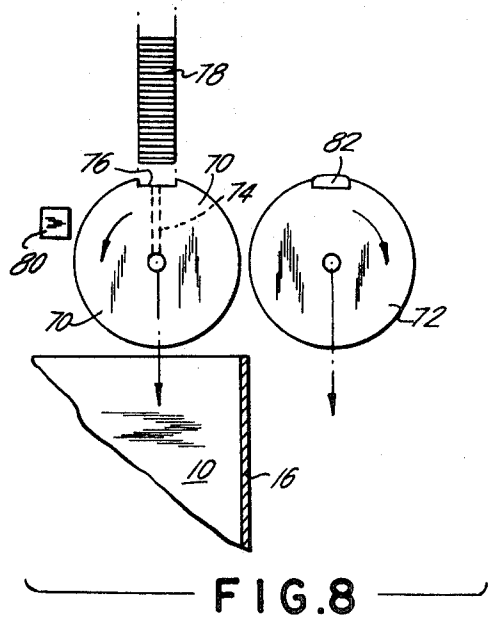
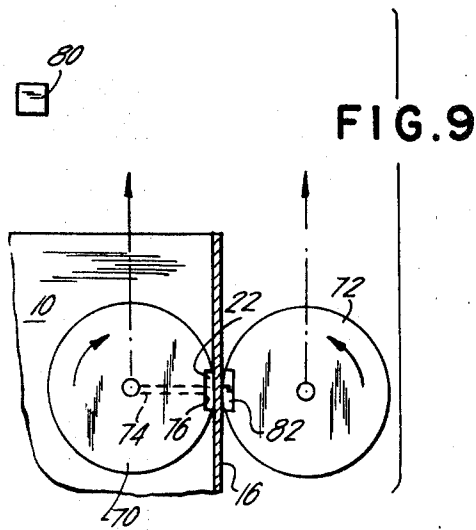


FIG. 7

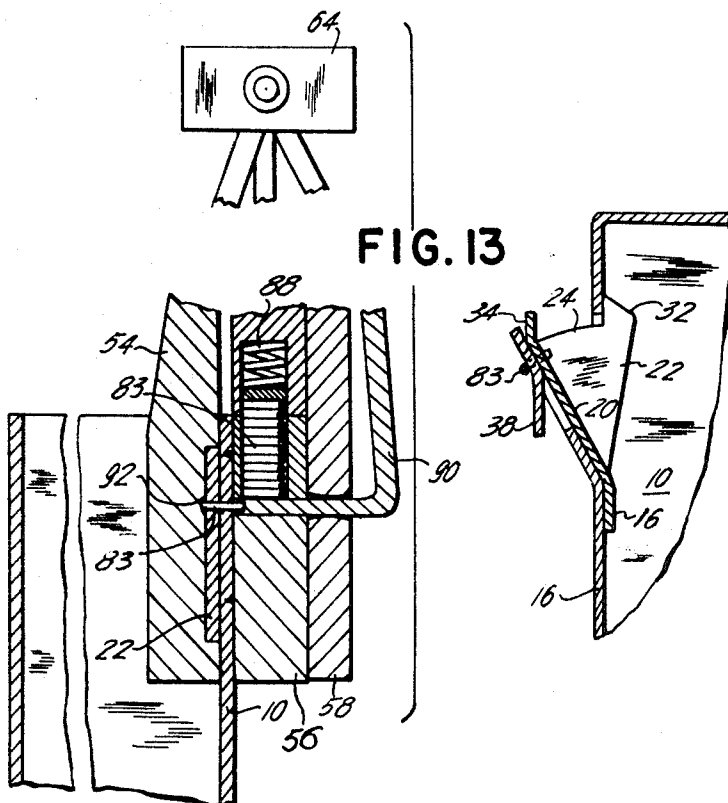
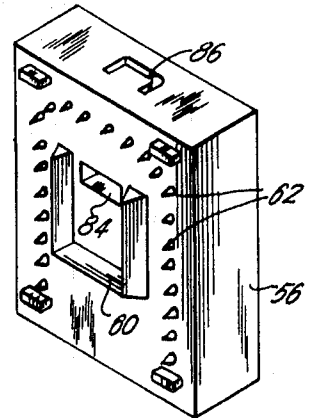


FIG. 12

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DISPENSING BOXES AND METHODS AND MEANS FOR MANUFACTURE THEREOF

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Original application Oct. 21, 1966, Ser. No. 593,611, now Patent No. 3,484,034, dated Dec. 16, 1969. Divided and this application Nov. 10, 1969, Ser. No. 871,315

Int. Cl. B31b 49/02, 1/14, 1/90

U.S. Cl. 93—39R

9 Claims 10

ABSTRACT OF THE DISCLOSURE

Methods and apparatus for making a container having a tab projecting downward from an upstanding flap defined by partly-penetrating perforations following an inverted U-shape cut made in the wall of the container.

This is a division of Ser. No. 593,611, filed Oct. 21, 1966, now Pat. No. 3,484,034.

This invention relates to boxes for dispensing granular material and particularly to such boxes as dispense granular material through a spout that is opened with a tab as illustrated in U.S. Pat. No. 3,237,835 issued Mar. 1, 1966.

Such channel-shaped spouts have tabs projecting from the center portion of the channel so that a user by grasping the tab can open and close the box by operating the spout. These spouts assure sanitary handling of the spout. However, they frequently permit the granular material to sift through slits formed in the box when the spout is manufactured, especially at points where the channel passes into the box. Moreover boxes with such spouts are difficult to manufacture. Such spouts are also sometimes difficult to open and put a strain on the tab.

An object of this invention is to improve boxes for dispensing granular materials.

Another object is to improve methods and means for manufacturing such boxes.

Still another object is to eliminate the above mentioned deficiencies of such boxes and their manufacturing methods.

Yet another object is to avoid undesired sifting of material from such boxes and simplify manufacturing procedures for such boxes.

Still another object is to minimize the effort to open the spout and to minimize the strain on the tab.

To these ends, and according to a feature of the invention, a box for pouring granular material is completed by attaching the center portion of a channel-shaped spout member to the inside of the box, perforating the box about three sides of the center portion of the channel-shaped spout, and within the perforated area cutting a tab which a user can grasp. By pushing in the perforated area a user can form a spout-carrying, hinged flap which he can pull out of the box by the tab. Preferably the perforations penetrate the box only partially and glue attaches the spout member to the flap. This keeps the box completely intact during shipping. Preferably the perforations are aligned in the shape of an arch so as to conform to a thumb or finger shape that pushes in the perforated area.

According to another feature of the invention, the tab forms a U-shape extending in a direction opposite to the arch of the flap. The tab then hinges as far as possible away from the flap hinge. This reduces the force and hence strain on the tab required to open the flap and spout.

According to still another feature of the invention the spout member is applied to the box after the latter is folded while at the same time the perforation and tab are

cut. This is done according to other features of the invention with a plier like device or with a pair of mated and moving drums, one carrying the spout member and the other carrying a cutting tool. According to still another feature of the invention a staple is simultaneously added while attaching the spout member.

Those and other features of the invention are pointed out in the claims. Other objects and advantages of the invention will appear from the following description of embodiments of the invention when read in light of the accompanying drawings wherein:

FIG. 1 is a partial perspective view of a box with a spout, embodying features of the invention and showing the spout in open position;

FIG. 2 is section of FIG. 1;

FIG. 3 is a partial section of the box in FIG. 1 showing the spout before the box is opened and used;

FIG. 4 is a partial perspective of the box shown by the section of FIG. 3;

FIG. 5 is a plan view of the interior of FIGS. 3 and 4;

FIG. 6 is a perspective partly schematic view of an apparatus embodying features of the invention for manufacturing the box of FIG. 1;

FIG. 7 is a perspective view showing a detail of the apparatus in FIG. 6;

FIGS. 8 and 9 are schematic representations of another apparatus, shown in two positions, for manufacturing the box of FIG. 1 according to the invention;

FIGS. 10, 11 and 12 are partial plan, front elevation, and side elevation views respectively of another embodiment of the box in FIG. 1; and

FIG. 13 is a partial section showing an apparatus, embodying features of the invention, for manufacturing the box of FIGS. 10, 11 and 12.

In FIGS. 1, 2 and 3, a rectangular cardboard box or carton 10, containing material to be poured, integrally carries an arch shaped flap 12 hinged outwardly along a line 14 on a sideface 16. The flap 12 is torn from the sideface 16 along perforations and leaves an arch shaped opening 18. Glued to the interior face of the flap 12 is the center section 20 of a chute-shaped channel 22 integrally possessing sector like wings 24 and 26 extending through the opening 18 into the box 10. The channel 22 may be made from cardboard, metal, paper or plastic, such as polyethylene with sufficient resilience to bias the wings 24 and 26 against the vertical edges of the opening 18. The invention also contemplates a pair of vertical slits extending upwardly from vertical edges of the opening 18 and aligned with these edges. The slits receive the circular edges of the wings 24 and 26 to guide them near their peripheries so as to maintain their angular orientation relative to the central portion 20 as the flap 16 and channel 22 are articulated about line 14. The wings 24 and 26 may also be kept against the vertical edged by bosses that extend into the channel from the box 10. Extending downwardly and integrally from the central section 20 and also secured against the interior of sideface 16 is a rectangular reinforcing strip 28. Stops 30 and 32 at the ends of respective wings 24 and 26 define the extent to which the flap 12 and channel 22 may be articulated outward. An extension 34 of the central portion can be bent inwardly to serve as a locking means for keeping the flap 12 closed.

Projecting integrally from the flap 12 is a tab 38. The latter is formed by cutting a tongue shaped tab in the flap and bending it outwardly to articulate the spout assembly formed by the flap 12 and the chute-shaped channel 22 about the hinge line 14 against and toward the box 10. A user grasps the tab 38 and either pulls or pushes according to the desired movement. The spout assembly may be completely closed by pushing the extension 34 into the

opening 18 locking the spout assembly as shown in FIG. 3. FIG. 2 shows the box 10 with the spout assembly open.

FIGS. 4 and 5 show the box 10 before it is opened. Perforations 40 extend partly through the sideface 16 along the arch that defines the flap 12. For simplicity in assembly the channel 11 appears unfolded flat against the interior of the sideface 16 in butterfly fashion. The channel 22 is weakened along lines 42 to establish fold lines.

A user of a new box first lifts the cut-out downwardly extending tab 38 to permit its being grasped and make it assume an outward position. The user then presses inwardly with a finger or preferably a thumb against the flap portion outlined by the perforations whose arch alignment conforms approximately to the thumb shape until the material breaks along the perforations 40 and forms the flap 12 as well as the opening 18. The user now grasps the inwardly leaning flap, which carries the chute-shaped channel, by means of the tab 38 and pulls the flap and spout assembly outward into the desired position. During this outward movement the flat-lying wings 24 and 26 shown in FIG. 5 as they are drawn outwardly against the vertical edges of opening 18 fold along the weakened lines 42 into the shape in FIG. 1. The resilience of the channel 22 keeps the wings 24 and 26 biased against these vertical edges. If necessary the user can guide or snap the circular portion of wings 24 and 26 into suitable slits in the box sideface 16. When a user pulls the spout assembly with its wings 24 and 26 folded and biased against the vertical edges of opening 18 to the position of FIG. 1, box 10 can be tilted and the contents poured.

The box 10 with the spout assembly can be manufactured by horizontally passing flat cardboard stock, with glue applied to the flap area 18, past a horizontal-axis drum that pneumatically picks up individually cut and weakened spout blanks and by rotating presses them against the glued area. The box is then cut to shape, folded and glued. Preferably the wingspan of the channel 22, that is the total overall flat width of the channel 22 is less than the interior width of sideface 16. Such a method corresponds to that shown in copending application Ser. No. 563,508 filed July 7, 1966. However here it is unnecessary to pass a tab through a slot during application of the channel. By making the channel wingspan shorter than the interior box width the channel can remain flat as in FIG. 5 when the box is folded. Otherwise the spout blanks must be at least partly folded along lines 42 before the box 10 is folded.

According to the invention the spout blank may be applied after folding and gluing the box 10.

This is accomplished as shown in FIG. 6. Here the box is folded and glued in the folding apparatus 49, then a plier shaped applicator 50 presses a glue-carrying spout blank 52 held on its inner arm 54 against the interior surface of the sideface 16 on the box 10. A cutting block 56 at the end of the arm 58 presses against the outside. The block 56, whose details appear in FIG. 7, cuts the tab 38 with a U-shaped knife projection 60 and forms the arch-aligned perforations 40 by means of conical points 62, that are long enough only to penetrate partly into the sideface 16.

The applicator 50 is automatically opened and closed as well as moved up and down to grasp successive boxes 10 by vertically reciprocating machinery 64. The latter is time-coupled to a suitable intermittently-moving belt 66 that stops each successive box 10 beneath the applicator 50. For improved adhesion of the channel, glue heating means in the arm 54 can be added.

The channel 22 may also be applied after folding the box in apparatus 49, by means of two drums 70 and 72 that roll back and forth between the positions shown in FIGS. 8 and 9 as a box 10 stops in its intermittent lateral movement on a belt (not shown). A pneumatically energized bore 74 draws a blank for the channel 22 into a mating recess 76 from a stock 78 of blanks. A glue applicator 80 applies glue to the center section 20 of the chan-

nel 22 as the drum 70 rolls past it. The drum 70 applies the channel when it reaches the position of FIG. 9 and the pneumatic drawing power in the bore 74 releases the blank. A cutting block 82 having a concave surface but otherwise corresponding to the block 56 of FIG. 7 cuts the perforations 40 and the tab 38 outline. For improved adhesion of the channel to the box the drum 70 possesses glue heating means.

The invention furnishes a box which holds granular material without the danger of material sifting out.

The invention also contemplates applying a reinforcing staple 83 as shown in FIGS. 10, 11 and 12. This is accomplished by apparatus similar to FIG. 9. A stapler-arm opening 84 and a U-shaped stapler-stack tunnel 86 is added in the block 56 of FIG. 7. The staple application is accomplished with application of the channel 22 as shown in FIG. 13. A spring 88 forces a staple stack down into the path of a stapler arm 90 that drives the lower staple through the box 10 and channel 22 into a staple-closing recess 92. The arm 90 is also operated by the apparatus 64.

While embodiments of the invention have been shown in detail it will be obvious to those skilled in the art that the invention may be embodied otherwise without departing from its spirit and scope.

What I claim is:

1. Apparatus for making a container comprising means for folding the container, spout applicator means for applying a spout, said spout applicator means including a perforating block having a plurality of projections aligned in a U-shape for partly entering the container and having a U-shaped cutting edge within the aligned projection for simultaneously cutting a tab, said applicator means also including means for carrying a spout blank into the partly formed container and securing it into the container opposite said cutting block.

2. Apparatus as in claim 1 wherein said applicator means include a plier like device having two arms one of which carries said perforating block and remains outside of said container and the other of which enters the container securing said blank.

3. Apparatus as in claim 1 wherein said applicator means include a pair of rolls one of which carries said perforating block and remains outside of said container and the other of which enters the container for securing said blank.

4. Apparatus as in claim 1 wherein said applicator means include a stapling device for securing said spout blank to said wall.

5. Apparatus as in claim 2 wherein said applicator means includes a third arm and means in the one of said two arms on the outside of said container for holding staples and wherein said third arm passes through the arm outside said container and through said block for driving staples through said spout blank and through the wall in said container.

6. The method of manufacturing a carton which comprises folding the carton into its shape, simultaneously applying to the inner portion of one wall of said carton a spout blank and to the outside a cutting block having a U-shaped line of perforating projections and a U-shaped cutting edge in the line of projections, and pressing said blank and said block together against said wall until said cutting edge penetrates the wall but said projections penetrate only partially while securing said blank to said wall.

7. The method as in claim 6 wherein said blank is glued to the wall when it is pressed.

8. The method as in claim 4 wherein said blank is stapled to the wall while said block and said blank are pressed against the wall.

9. The method as in claim 8 wherein said blank is glued as well as stapled to the wall.

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WAYNE A. MORSE, JR., Primary Examiner

U.S. Cl. X.R.

93—35(PC), 36(DA), 58(P); 113—1(H), 120(P);
227—21