CARTON WITH HANDLE AND POURING SPOUT

Fig. 2

Fig. 3

Fig. 4

INVENTOR.

EDWARD L. BUMP

ATTOREY
FIG. 8 is a fragmentary plan view of a blank of sheeting material comprising a modified form of my invention. FIG. 9 is a fragmentary cross-sectional view taken along line 9—9 of FIG. 10. FIG. 10 is a fragmentary perspective view showing the modified form of my invention in its fully assembled and sealed condition.

Referring more particularly to the drawings, in which like numerals refer to like parts, my novel carton 10 might typically be constructed from plastic coated paper or cardboard for use as a container for milk or some other pourable liquid or dry material. Preferably made from a single piece of material, the carton 10 has four walls 11, 12, 13 and 14, a pour spout 15 located at the corner defined by the walls 11 and 14, and a handle 16 usable both for carrying and pouring. The handle 16 extends diagonally from the corner defined by the walls 12 and 13 toward the corner forming the pour spout 15. The carton 10 may have either a square or rectangular cross-section. For illustrative purposes only, a carton with a square cross-section is shown in the drawings. A blank 17 from which the carton 10 may be made is shown in FIG. 1. The blank 17 has a top section 18, a wall section 19 and a bottom section 20. A lateral crease 21 separates the top section 18 and the wall section 19, a lateral crease 22 separates the wall section 19 and the bottom section 20. The lateral creases 21 and 22 are substantially parallel and run the entire width of the blank 17.

Four wall creases 23, 24, 25 and 26 divide the wall section 19 into an attachment flap 27a and the four walls 11, 12, 13 and 14. The wall creases 23, 24, 25 and 26 are substantially parallel, and are substantially perpendicular to the lateral creases 21 and 22. The middle wall crease 25 and the outer left wall crease 23 run the entire height of the blank 17, while the inner left wall crease 24 and the right wall crease 26 run from the bottom of the blank 17 to the lateral crease 21. A top crease 27 slightly inclined toward the outer left wall crease 23 runs from approximately the intersection of the inner left wall crease 24 and the lateral crease 21 to the top of the blank 17. A similar top crease 28 slightly inclined toward the right edge 29 of the blank 17 runs from approximately the intersection of the lateral crease 21 and the right wall crease 26 to the top of the blank 17. The middle wall crease 25, the left outer wall crease 23 and the top creases 27 and 28 divide the top section 18 into four top panels 30, 31, 32 and 33. The wall creases 23, 24, 25 and 26 divide the bottom section 20 into bottom flaps 34, 35, 36 and 37.

The top panels 30 and 33, which are substantially mirror images of each other, are positioned adjacent to each other when the carton 10 is assembled. The top panel 30 has a triangular section 38 and a handle flap 39. The top panel 33 has a corresponding triangular section 40 and a corresponding handle flap 41.

Both triangular sections 38 and 40 are approximately the same shape. One leg of the triangular section 38 is formed by the lateral crease 21, the second leg is formed by the top crease 27, and the third leg is formed by a crease 42 which separates the triangular section 38 and the handle flap 39. One leg of the triangular section 40 is also formed by the lateral crease 21, the second leg is formed by the top crease 28, and the third leg is formed by a crease 42 which separates the triangular section 40 and the handle flap 41.

The handle flaps 39 and 41 have corresponding finger openings 44. Finger tabs 45 and 46 preferably project into the finger openings 44 to make gripping of the handle flaps 39 and 41 easier. The finger tabs 45 and 46 are foldable along creases 47 and 48 to provide a support
surface for the fingers. Two creases 49 and 50 extend from a common point on the crease 42 in the handle flap 39 slightly to the rear of the finger opening 44. Corresponding creases 51 and 52 extend from a common point on the crease 42 in the handle flap 41 slightly to the rear of the finger opening 44. These creases 49, 50, 51 and 52 facilitate the filling of my novel carton 10, as will be described more fully as the description progresses. Like the top panels 30 and 33, the top panels 31 and 32 are adjacent each other in the assembled carton 10 and are substantially mirror images of each other. The top panel 31 is divided by inclined creases 53, 54 and 55 into four generally wedge-shaped sections 56, 57, 58 and 59 which lie side by side like sectors of a circle. Similarly, the top panel 32 is divided by inclined creases 60, 61 and 62 into four corresponding wedge-shaped sections 64, 65, 66 and 67. The inclined creases 53, 54 and 55 extend from the intersection of the wall crease 24 and the lateral crease 21 to the top of the blank 17, while the inclined creases 60, 61 and 62 extend from the intersection of the wall crease 26 and the lateral crease 21 to the top of the blank 17.

Spout sections 59a and 66a project, respectively, from the corresponding wedge-shaped sections 59 and 66 to form the spout 15 for my improved carton 10. The spout sections 59a and 66a are jointed at the middle wall crease 25. Each of the wedge-shaped sections 59 and 66 has a portion of the lateral crease 21 as one of its sides. A projection 67 projects from each of the spout sections 59a and 66a. A perforated line 68 lying substantially parallel to the top of the lip 67 separates the lip 67 from the spout sections 59a and 66a, allowing the lip 67 to be easily detached from them. The spout section 59a is separated from the wedge-shaped section 59 by a spout crease 70 which runs from the left end 68a of the scored line 68 to the lateral crease 21, crossing the middle wall crease 25 a suitable distance from the crease 21. The spout section 66a is separated from the wedge-shaped section 66 by a corresponding spout crease 69a which runs from the right end 68b of the scored line 68 to the lateral crease 21, intersecting the spout crease 69a approximately at the middle wall crease 25.

The corresponding wedge-shaped folding sections 58 and 65 are located adjacent to the wedge-shaped sections 59 and 66. In the assembled carton 10 the folding section 58 extends between the triangular section 38 and the wedge-shaped section 59, while the folding section 65 extends between the triangular section 40 and the wedge-shaped section 66. Substantially triangular sealing flaps 70 project from each of the folding sections 58 and 65.

The sealing flaps 70 are separated from the remainder of the folding sections 58 and 65 by the creases 71. As shown in the drawings, it is preferable that the sealing flaps 70 should not extend to the lateral creases 55 and 62, so that a space 70a is provided between each sealing flap 70 and the protective lip 67. Such openings 70a facilitate folding of the folding sections 58 and 65 with respect to wedge-shaped sections 59 and 66 respectively, along creases 55 and 62.

The remaining wedge-shaped sections are the connecting sections 56, 57, 63 and 64. The vertex angles of each of the connecting sections 56, 57, 63 and 64 are substantially equal. Handle engaging tabs 72 project from each of the connecting sections 57 and 64. Creases 74 separate the handle engaging tabs 72 from the remainder of the connecting sections 57 and 64. Creases 74 preferably extend beyond the creases 54 and 61 separating connecting sections 57 and 58, and 64 and 65, respectively to further separate the handle engaging tabs 72 and the sealing flaps 70, as shown. Small, approximately triangular areas 73, preferably lie between creases 54 and 74, and between creases 61 and 74.

Looking at the bottom section 20 of blank 17 in FIG. 1, the inner flaps 34 and 36 are the first to be folded in assembling the bottom of the carton 10. The outer bottom flaps 35 and 37 are folded over the inner flaps 34 and 36. The outer flaps 35 and 37 extend from opposite walls of the assembled carton 10, as do the inner flaps 34 and 36.

The outer flaps 35 and 37 are approximately rectangular, and are sufficiently large to cover and seal the bottom of the carton 10. Preferably, the outer corners 87 and 88 of the outer flap are beveled. The inner flap 34 has a pair of substantially congruent triangular portions 75 and 76. The preferably identical inner flap 36 has a pair of corresponding triangular portions 77 and 78.

The triangular portion 75 is outlined by the wall crease 23, a folding crease 79 extending from the intersection of the wall crease 23 and the lateral crease 22, and an edge 80 extending from the bottom end of the wall crease 23 to the point where the triangular portion 75 intersects the folding crease 79. The triangular portion 76 is outlined by the wall crease 24, a folding crease 81 extending from the intersection of the wall crease 24 and the lateral crease 22, and an edge 82 extending from the bottom end of the wall crease 24 to the point where the triangular portion 76 intersects the folding crease 81. The triangular portion 77 is outlined by the wall crease 25, a folding crease 83 extending from the intersection of the wall crease 25 and the lateral crease 22, and an edge 84 extending from the bottom end of the wall crease 25 to a point where the triangular portion 77 intersects the folding crease 83. The triangular portion 78 is outlined by the wall crease 26, a folding crease extending from the intersection of the wall crease 26 and the lateral crease 22, and an edge 86 extending from the bottom end of the wall crease 26 to a point where the triangular portion 78 intersects the folding crease 85.

Preferably the triangular portions 75, 76, 77 and 78 are isosceles, with edges 80, 82, 84 and 86 and the edges along the folding creases 79, 81, 83 and 85 being equal. As illustrated, the outer corners of the inner flap 34 adjacent the edges 80 and 82 are preferably cut away to define a tongue 89. The outer corners of the inner flap 36 are similarly cut away to define a tongue 90. The tongues 89 and 90 are sufficiently large to overlap and be secured to each other in the assembled carton 10.

Assembly

The first step in the assembly of my carton 10 is to cut and create a blank 17 of sheeting material as shown in FIG. 1. Next, the blank 17 is folded in half about the middle wall crease 25 to bring the left outer wall crease 23 and the right edge 29 together. The sheet 27a is then secured to the side panels 23, the wall 13 and the bottom flap 37 along the right edge 29, preferably on the inside of the carton 10. If the sheeting material from which the blank 17 is cut is plastic coated paper or all plastic, the flap 27a and all other mating surfaces may be secured by heat sealing. If some other material is used, the flap 27a may be secured with glue or other similar conventional means. The blank 17 is then squared.

The manner in which the bottom flaps close the bottom of the carton 10 is best shown in FIG. 5. Together, the inner flaps 34 and 36 are folded inward toward each other. The folding occurs at the lateral crease 22, and the folding creases 79, 81, 83 and 85. As the inner flaps 34 and 36 are folded toward each other they pull the outer flaps 35 and 37 inward toward each other. The inwardly collapsing triangular portions 81 and 83 and outer flap 35, define an envelope into which the free end of outer flap 37 is adapted to slide. Entry of the outer flap 37 into the envelope is facilitated by the beveled outer edges 88 of the flaps 35 and 37. The overlapping portions of the outer flaps 35 and 37, the overlapping portions of the inner flaps 34 and 36, and all other required surfaces are then appropriately sealed as indicated above.

The initial steps in assembling the top of the carton 10 are suggested by FIG. 6. First, the connecting flap 63 is folded about the inclined creases 28 and 60 over the con-
necting section 64, thereby matching the top crease 28 and the inclined crease 61. Similarly, the connecting section 56 is folded about the inclined creases 27 and 53 over the connecting section 57, thereby matching the top crease 27 and the inclined crease 54. Both of these foldings are accomplished substantially simultaneously by folding the triangular sections 38 and 40 toward each other. The triangular section 38 folds at the top crease 27 and the lateral crease 21; the triangular section 40 folds at the top crease 28 and the lateral crease 21. This folding laps the triangular section 38 over the now matching connecting sections 56 and 57, and laps the triangular section 40 over the matching sections 63 and 65. At this time the connecting section 56 is suitably seated to connecting section 57 and to the underside of the triangular section 38, and the connecting section 63 is seated to connecting section 64 and to the underside of the triangular section 40. The handle engaging tabs 72 are then sealed to the inside of the handle flaps 39 and 41 after which the top of the carton 10 appears substantially as shown in FIG. 7. The carton 10 is most easily filled in the partially sealed condition illustrated in FIG. 7. A substantial opening to the carton 10 is exposed by spreading apart the handle flaps 39 and 41. The spreading is made easy by the creases 58, 59, 60, 51, and 52. These creases are located on the rear of the handle flaps 39 and 41, just about where the top of the attachment flap 27a is attached to the inner surface of flap 41. When spread apart, the handle flaps 39 and 41 fold outward at the creases 50 and 52, and upward again at creases 49 and 51. The opening at the spout 15 and between the spread handle flaps 39 and 41 is sufficiently large to permit rapid filling of the carton 10. After the carton 10 has been filled, sealing of the top of the carton 10 is completed. The handle flaps 39 and 41 are first pressed against each other to match the flaps 39 and 41 and the handle engaging tabs 72. The tabs 72 and the matching portions of the handle flaps 39 and 41 are then suitably secured together in the manner indicated above. The spout 15 and lip 67 are then sealed against the handle 16 in the position shown in FIG. 2 as follows: The folding sections 58 and 65 are folded about the inclined creases 55 and 62 and against the inner surface of the wedge-shaped sections 59 and 66, respectively. The position of the carton 10 after such folding is substantially as shown in FIG. 3, except that the lip 67 is still attached to the spout 16, rather than the handle flaps 39 and 41, as shown. The folding sections 58 and 65 are of such size, and the handle flaps 39 and 41 are of such length along the creases 42 and 43 that the lower front corner 91 of the handle 16 presses the sealing flaps 70 against the spout 15 at approximately the intersection of the spout creases 69a and 69b. Thus, the triangular sections 38 and 40 are not parallel to the bottom of the sealed carton 10, but are inclined slightly upward from lateral crease 21 to the intersection of spout creases 69a and 69b. The spout 15 and the sealing flaps 70, which are folded and sealed against the inner surface of the spout 15 are now folded against and sealed to the handle 16 in the position shown in FIG. 2. The folding occurs along the spout creases 69a and 69b, and the creases 71, 54 and 61 and 21. The protective lip 67 detachably secured to the spout 15 is also sealed to the handle 16 as shown. If the carton 10 is properly sealed as described above, the seal will be hermetic. The important function of the folding sections 58 and 65 in opening and closing the spout 15 may now be more fully described. The inclined creases 54 and 61 bordering the folding sections 58 and 65 are respectively pivoted to the inclined creases 27 and 28, respectively bordering the triangular sections 38 and 40. Inclined creases 55 and 62 likewise pivotally join the folding sections 58 and 65 to the wedge-shaped sections 59 and 66, respectively. Thus, folding sections 58 and 65 in effect pivotally link the triangular sections 38 and 40 to the wedge-shaped sections 59 and 66. When the handle 16 is in its lower position shown in FIGS. 2 and 3, the inner surfaces of the folding sections 58 and 65 are folded against the inner surfaces of the wedge-shaped sections 59 and 66, thereby supporting the triangular sections 38 and 40 in an inclined position, and opening the spout 15. When the handle 16 and folding sections 58 and 65 are moved back and forth between their upper and lower positions, folding occurs at the lateral crease 21, the creases 42 and 43, and the inclined creases 54, 55, 61 and 62. Use of my carton 10 is convenient and simple. The seal holding the spout 15 against the handle 16 is first broken. This is easily done by inserting the thumbs under the downwardly facing folding sections 58 and 65 and applying an upward pressure. As the folding sections 58 and 65 are moved upward by the pressure of the thumbs, the spout 15 and the sealing flaps 70 sealed thereto are pulled away from the handle 16 to the position of normal carton construction. At this time the spout 15 is pulled away from the handle 16, it detaches itself from the protective lip 67 along the perforated line 68, leaving the lip 67 secured to the handle 16. To ensure that the lip 67 does remain on the handle 16, the seal between the lip 67 and the handle 16 must be stronger than the perforated connection between the lip 67 and the spout 15. The protective lip 67 insures a sanitary spout by protecting the pouring lip of the spout 15 from dirt or other contamination prior to use. Once the spout 15 is unsealed, the person pulls the handle 16 upwardly to its upward position thereby pulling the sealing flaps 70 away from the inner surface of the spout 15 and opening the spout 15 for pouring, as shown in FIG. 4. After pouring the desired amount, the person pushes down on the handle 16 to place the spout 15 in the closed position of FIG. 3. In that position the carton 10 will be closed and its contents protected. The advantages of my novel carton 10 are now quite obvious. Its diagonal handle 16 may be used both for carrying and pouring. The corner-pour spout 15 is carefully designed to have an opening of limited size that reduces the possibility of spilling or over-pouring. Furthermore, its design utilizes the protective lip 67 of the carton as an aid in pouring, thus eliminating a need for special spouts to be constructed on the sides of the carton as commonly required with prior carton construction. The design of the blank 17 is such that the blank 17 may be made of sheet plastic or other synthetic sheeting material, as well as coated or uncoated paper and cardboard. A modified form of my invention having improved protective means for the pouring spout is shown in FIGS. 8–10. In this modified form of my invention, when the carton is in its initially sealed condition, all portions of the spout which come in contact with the product during the dispensing thereof are protected from dirt and contamination. One of the primary changes in my modified form is in the construction of protective lip 67' has a generally elliptical configuration and comprises an outer protector portion 67a' and an inner sealing portion 67b' which is detachably connected to spout sections 59a' and 66a' by a perforated score line 68'. The crease 67c' divides lip 67' into outer portion 67a' and inner portion 67b' and vertically extending crease 25' divides it into right and left portions. Outer protector portion 67a' is substantially larger than inner sealing portion 67b' so that when the outer protector portion is folded about crease 67' it will completely cover and mask the upper portions of spout sections 59a' and 66a'. Protector portion 67a' is separated from sealing flaps 70' by
cut lines 70a'. Cut lines 70a' also define concave locking edges 59b' and 66b' on spout sections 59a' and 66a'. Inner sealing portion 67b' has straight edges 67d'. Straight edges 67a' and concave locking edges 59b' and 66b' will be discussed more fully hereinafter in connection with the assembling and sealing of the carton.

It is understood that protective lip 67' is not intended to be limited to a generally elliptical shape but can take other suitable shapes as well.

Handle flaps 39' and 41' may also preferably have cut out portions 39a' and 41a' which are mirror images of each other. Flaps 39' and 41' have respective protrusions 39b' and 41b' which extend into cut out portions 39a' and 41a', respectively. Protrusions 39b' and 41b' have upper edges 39c' and 41c' and lower edges 39d' and 41d', respectively. Cut out portions 39a' and 41a' have edges 39e' and 41e', respectively.

In my modified construction, as shown in FIG. 8, those portions of crease 21' defining the top edge of panels 11' and 14' are inclined to the horizontal so that when the carton is in its assembled and sealed condition the top edge of panels 11' and 14' will be in juxtaposition with creased 19' and 29', respectively.

The bottom of blank 17' is identical to the bottom of blank 17 shown in FIG. 1.

Modified assembly

The assembly of my modified carton 10 will now be discussed insofar as it differs from carton 10 shown in FIGS. 1-7.

The first step in the assembly of my modified carton 10 is, of course, to cut and crease a blank 17 of paperboard as shown in FIG. 8. Next, the outer protector portion 67a' of protective lip 67 is folded about crease 67c' to overlie the outside of inner sealing portion 67b' and these portions are then heat-sealed together. The blank 17 is then formed into a flat shell in the same manner as carton 10. The carton 10 is then ready to be shipped to the user as a flat shell.

To put the carton 10' into use, the user first squares the carton and forms and seals the bottom in a manner identical to that discussed in connection with carton 10.

The initial steps in assembling the top of carton 10 and filling it are also substantially identical to those steps discussed in connection with carton 10.

After the carton 10' has been filled, the sealing of the top is completed. The handle flaps 39' and 41' are first pressed against each other to match flaps 39' and 41' and the handle engaging tabs 72' and the tabs 72' and the matching portions of handle flaps 39' and 41' are heat-sealed together.

The spout and protective lip 67' are then sealed against the handle as follows: The folding sections 58' and 65' are folded about the inclined creases 55' and 62' and against the inner surface of wedge-shaped sections 59' and 66', respectively. When this fold has been completed the parallel and overlying creases 27' and 54', and 28' and 62' are in respective juxtaposition with portions of crease 21' defining the inclined top edge of panels 11' and 14'. Also, creases 71' are in juxtaposition with creases 69a' and 69b', respectively. The sealing flaps 70 are sealed to the inner surface of spout sections 59a' and 66a' in fluid-tight relation. The upstanding folding sections 58' and 65' and wedge-shaped sections 59' and 66' are then folded backwards about their respective creases causing the sealing flaps 70', spout sections 59a' and 66a', and inner sealing portion 67a' of lip 67' to be brought into flat position with handle 16'. As shown in FIG. 9, the sealing flaps 70' and spout sections 59a' and 66a' are brought into such a position that the concave locking edges 59b' and 66b' engage the lower locking edges 39d' and 41d' of protrusions 39b' and 41b', respectively. The sealing lip 67' is brought backward to such a position that the flat edges 67d' of inner sealing portion 67b' engage edges 39c' and 41c' of protrusions 39b' and 41b'.
(c) a left wall crease, a middle wall crease and a right wall crease dividing said wall section into four walls, said wall creases being substantially perpendicular to said first crease and extending for the full height of said blank,

(d) said three wall creases dividing said bottom section into a first, a second, a third and a fourth bottom flaps adapted to form the bottom of the carton, and dividing said top section into a first, a second, a third and a fourth top panel adapted to form the top of the carton, said first and second top panels and said third and fourth top panels to be adjacent in the completed carton,

(e) said third and fourth top panels having corresponding triangular sections and handle flaps,

(f) each of said triangular sections having one side formed by said first crease, a second side formed by a wall crease, and a diagonal side,

(g) a pair of corresponding handle flaps extending from said diagonal sides in pivotable relation and being adapted to be secured together to form a handle for the completed carton,

(h) said first and second top panels each being divided by three inclined creases into corresponding first, second, third and fourth wedge-shaped sections, each of said first wedge-shaped sections having one side formed by a wall crease forming one side of a triangular section, and each of said fourth wedge-shaped sections having one side formed by a part of said first crease,

(i) spout sections projecting from said fourth wedge-shaped sections of said first and second top panels and being secured together along the middle wall crease separating said first and second walls to define a spout for the completed carton,

(j) said third wedge-shaped sections being folding sections adapted to movably link said fourth wedge-shaped sections and said triangular sections,

(k) said first and second wedge-shaped sections being connecting sections adapted to be folded together and to be secured to said triangular sections to connect said third wedge-shaped sections and said triangular sections in abutting relation,

(l) a handle engaging tab pivotally secured to each of said second wedge-shaped sections and being adapted to be secured to said handle flaps,

(m) a sealing flap pivotally secured to each of said third wedge-shaped sections and being adapted to be secured to said adjacent spout sections and said handle flaps,

(n) a protective lip having an inner portion detachably secured along a perforated score line to said spout sections and an outer portion adapted to overlie said perforated score line, said protective lip being adapted to be sealed to said handle flap,

(o) said spout sections and said sealing flaps being adapted to define a spout opening for said completed carton,

3. A blank as specified in claim 2 wherein said handle flaps have cut-out portions therein for permitting said protective lip to be sealed to itself in the area of said cut-out portions,

4. The blank as specified in claim 2 wherein said handle flaps have cut-out portions therein adapted to receive a portion of said spout sections and permitting said protective lip to be sealed to itself in the area of said cut-out portions.

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JOSEPH R. LECLAIR, Primary Examiner.