United States Patent

Manizza

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[54] CARTON WITH WEB LOCK

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[52] **U.S. Cl.** ..... **229/31 R**

[51] **Int. Cl.** **B65d 5/24**

[58] **Field of Search** 229/31, 32, 35

[56] **References Cited**

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[57] **ABSTRACT**

This disclosure relates to foldable cartons wherein adjacent walls thereof are joined together by a folded web. In order that the carton may be retained in an erected condition, there has been provided a web lock which will lock the adjacent corners together in a rigid corner forming relation. The web lock includes a notch or opening in one of the walls adjacent the corner and a projection on the other of the walls extending into the notch and locking the walls against folding relative to one another.

13 Claims, 6 Drawing Figures

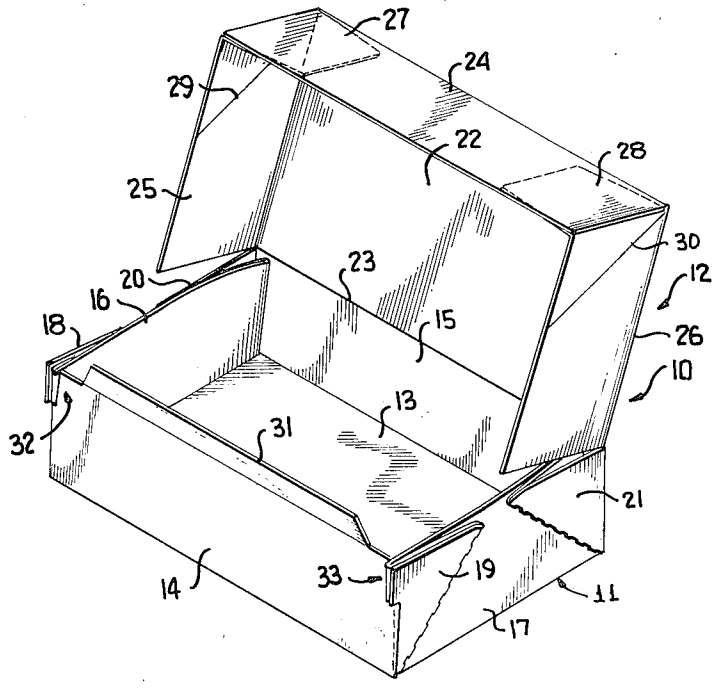
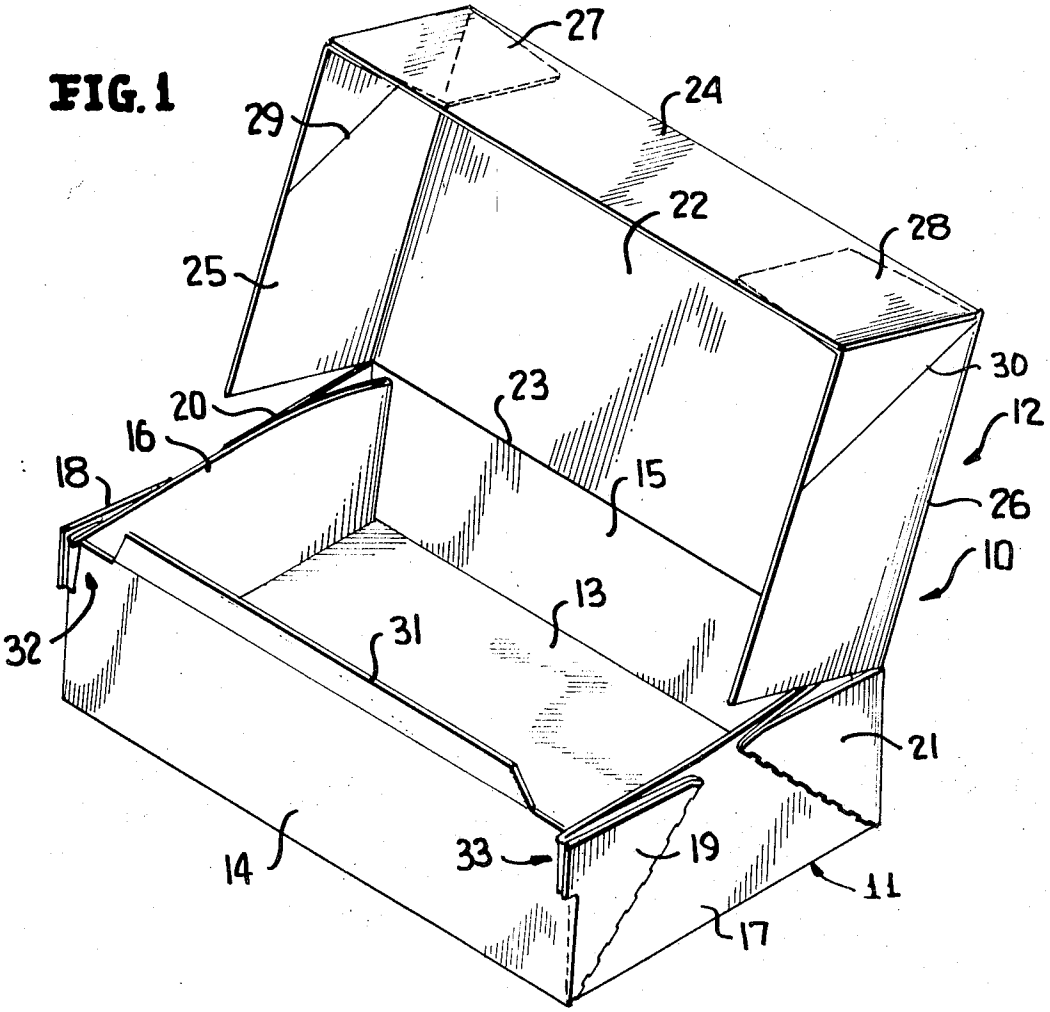


FIG. 1



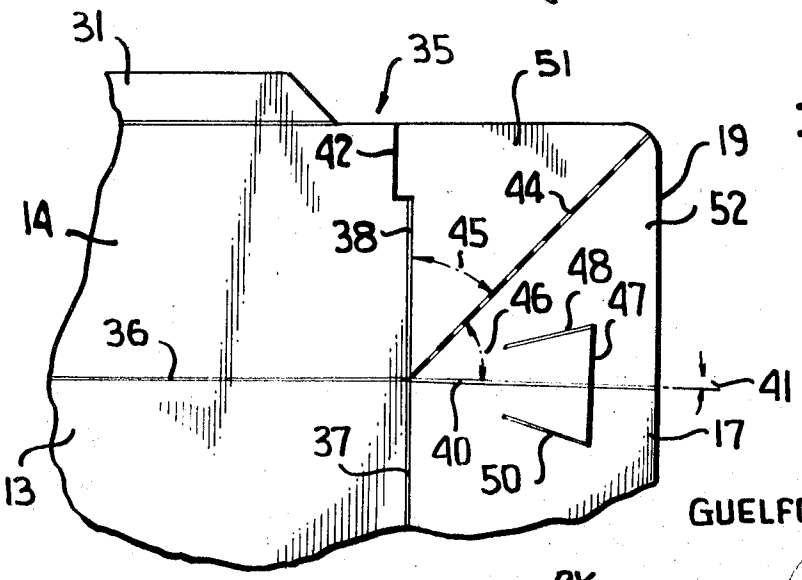


FIG. 2

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FIG.3

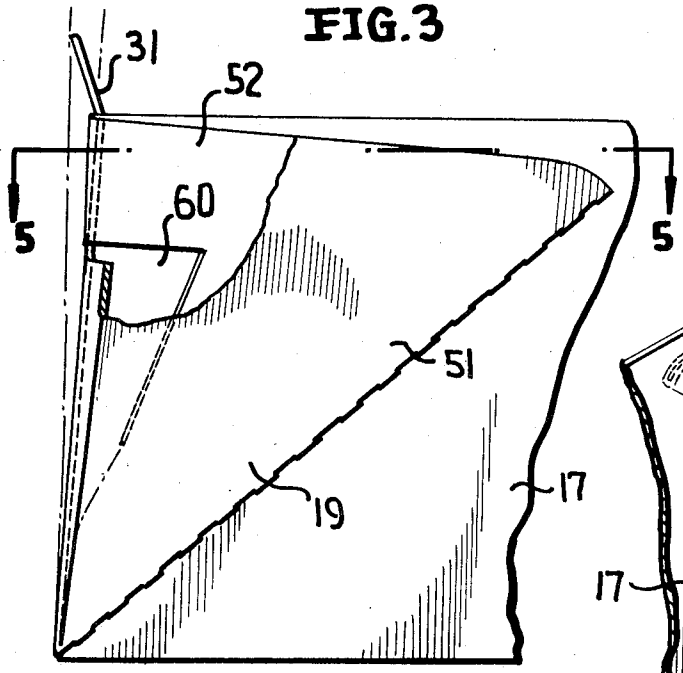


FIG.4

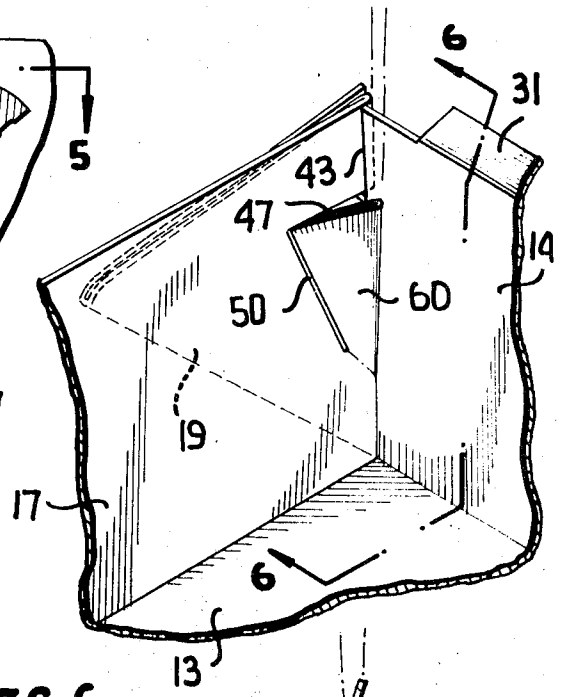


FIG.6

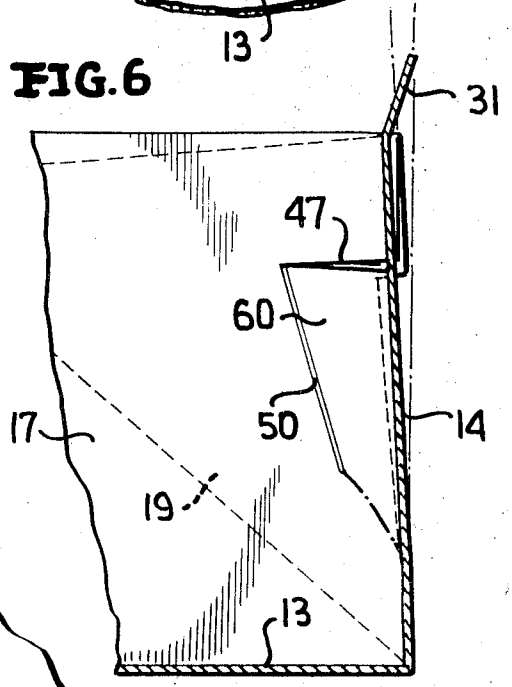
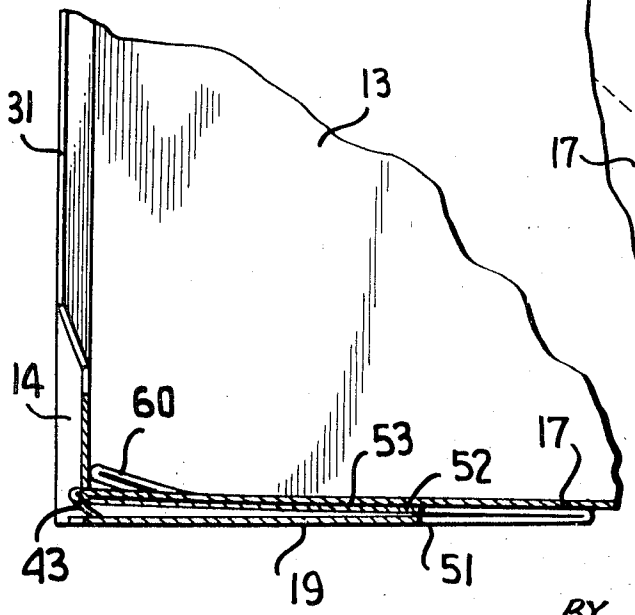


FIG.5



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CARTON WITH WEB LOCK

This invention relates in general to new and useful improvements in foldable cartons, and more particularly to a web lock for a foldable carton.

It is well known to provide cartons which are shippable in a folded flat condition and which are erected by merely pulling apart the upstanding walls thereof. Such cartons customarily have a web joining together the adjacent walls at the corners of the carton. While such cartons have many desirable attributes, they are deficient in that the cartons have a continued tendency to fold back up while they are being filled.

In accordance with this invention, it is proposed to provide a lock at a foldable carton corner so as to lock the adjacent walls thereof in corner forming relation so that the carton will remain open during filling.

A primary feature of the web lock formed in accordance with this invention is the provision of a notch in a free edge of one of the walls adjacent the corner and to have a projecting portion of the other of the walls extend into the notch to provide the desired lock.

Another feature of this invention is to provide in a foldable carton having a foldable web at the corner thereof formed between two adjacent walls a lock structure, the lock structure including a notch formed in a free edge portion of one of the walls adjacent the corner and the foldable web functioning to draw the notched portion of the one wall towards the edge of the other wall with a portion of the other wall projecting into the notch.

A principal feature of this invention is the formation of the foldable web whereby the foldable web is connected to one of the associated walls along a fold line disposed at an angle to the normal corner formed between the two adjacent walls whereby when the carton is erected, the foldable web serves to pull the one wall towards the adjacent edge of the adjacent wall, and wherein the one wall has an opening therein through which a portion of the outer wall will project to form an interlock.

Another feature of this invention is to so construct the edge portion of the wall which is to project into the notch with cut and fold line means to facilitate the deformation thereof whereby projection of the edge portion of the wall into the notch may be readily effected.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings:

In the drawings:

FIG. 1 is a perspective view of a foldable carton formed in accordance with this invention and shows the foldable webs at the two front corners of the bottom half thereof locked together so as to maintain the bottom half of the carton in an erected condition.

FIG. 2 is an enlarged fragmentary plan view of a corner portion of a blank for forming the carton of FIG. 1 and shows the specific details of construction thereof for effecting the formation of the web lock.

FIG. 3 is an enlarged fragmentary side elevational view of the front portion of the bottom of the carton of FIG. 1 and shows specifically the details of the web lock thereof.

FIG. 4 is an enlarged fragmentary perspective view of the corner and web lock of FIG. 3 as viewed from the interior of the carton

FIG. 5 is a fragmentary horizontal sectional view taken along the line 5—5 of FIG. 3 and shows further the details of the web lock.

FIG. 6 is an enlarged fragmentary vertical sectional view along the line 6—6 and shows specifically the sloping relation of the front wall of the carton bottom half.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIG. 1 a foldable carton, which is generally identified by the numeral 10. The foldable carton 10, except for the specific details of the web lock, which is the subject of this invention, is a conventional carton. The carton 10 is of a one-piece construction and includes a bottom half, generally identified by the numeral 11, and a closure, which is generally identified by the numeral 12.

Basically, the bottom half 11 includes a bottom panel 13 having hingedly connected thereto and projecting upwardly therefrom a front wall 14, a rear wall 15, and end walls 16 and 17. In order to facilitate the sealing of the corners of the bottom half 11 and also the immediate erection of the carton from its folded condition to its erected condition of FIG. 1, at each of the four corners of the bottom half 11 there is a folded web. Between the front wall 14 and the end wall 16 there is a folded web 18. A like folded web 19 is disposed between the front wall 14 and the end wall 17. Similar folded webs 20 and 21 are disposed between the rear wall 15 and the end walls 16 and 17, respectively.

The closure 12 is hingedly connected to the upper edge of the rear wall 15 and includes a top wall 22 which is connected to the rear wall 15 along a fold line 23. The top wall 22 has hingedly connected to the outer edges thereof a front wall 24 and a pair of side walls 25 and 26. The side walls 25 and 26 are connected to the front wall 24 by flaps 27 and 28 which are preferably glued to the inner surface of the front wall 24.

In order to facilitate the folding of the closure 12 to a flat condition, the side walls 25 and 26 are provided with diagonal fold lines 29 and 30, respectively.

It is also to be noted that the top edge of the front wall 14 is provided with a flap 31. The flap 31 is intended to interlock with the flaps 27 and 28 to retain the closure 12 in a carton closing position.

The aforegoing described carton structure is conventional and this invention relates to the modification of the foldable webs 18 and 19 and the provision of web locks, as at 32 and 33. Since these web locks are identical, except for being left hand and right hand portions of the carton, only the web lock 33 will be described in detail hereinafter.

Reference is now made to FIG. 2 wherein there is illustrated the blank from which the carton 10 is formed, the blank being generally identified by the numeral 35. It is to be understood that only the corner portion of the blank, which is of a one-piece construction, is shown and that the illustrated corner portion is that for forming the corner between the walls 14 and 17. The bottom wall or panel 13 has hingedly connected thereto along one edge thereof a first wall panel in the form of the wall 14 along a first fold line 36. The panel 13 also has secured thereto for hinging movement along an adjacent edge thereof a second wall panel in the form of the wall 17 along a second fold line 37. The foldable web 19 is connected to the wall 14 along a third fold line 38. The foldable web 19 is also connected to the wall 17 along a fourth fold line 40.

It is to be noted that the fold line 38 is a direct continuation of the fold line 37. On the other hand, the foldable web 19 has been modified so that its angular relation to the wall 17 has been formed by having the fold line 40 extend as a continuation of the fold line 36, but in angular relation thereto. The fold line 40 is disposed at an angle 41 to the extension of the fold line 36. This angular relationship is an important feature of the invention.

It is also to be noted that the carton blank 35 differs from the customary carton blank in that the fold line 38 does not extend entirely to the edge of the wall 14, but terminates in a generally L-shaped cut line 42 which will define a notch or opening 43 in the erected carton, as is best shown in FIG. 5.

The foldable web 19 is provided with a diagonal fold line 44 which extends from the corner of the panel 13 diagonally outwardly therefrom. The fold line 44 is disposed at an angle 45 from the fold line 38 and at a different and greater angle 46 from the fold line 40. For example, the angle 45 may be a 45° angle whereas the angle 46 may be a 46½° angle. This, of course, would make the angle 41 a 1½° angle.

It is further to be noted that the blank 35 is provided with a cut line 47 which extends generally parallel to the fold line 37 and which is formed in the wall 17 and the foldable web 19,

the cut line 47 extending across the fold line 40. In addition, converging fold lines 48 and 50 are formed in the foldable web 19 and the wall 17, respectively, the fold lines 48 and 50 extending from the opposite ends of the cut line 17 and projecting generally towards the panel 13.

In order to better describe the corner construction, the half of the foldable web 19 which is secured to the front wall 14 is identified by the numeral 51 whereas the other half thereof, which half is connected to the side wall 17 is identified by the numeral 52. The web half 52 is folded into overlying relation with respect to the wall 17 while the wall 17 overlies the panel 13 and is adhesively bonded thereto as at 53, as is shown in FIG. 5.

Referring now to FIGS. 3 through 6, inclusive, it will be seen that there is illustrated the details of the front left-hand corner of the carton bottom half 11. When the carton 10 is erected, the walls 14, 15, 16 and 17 of the carton bottom half 11 are folded outwardly from their overlying relation relative to the panel 13 to generally upright positions. As a result, the web half 51, which underlies the wall 14 in the folded condition of the carton 10, swings about the diagonal hinge line 44 to a position alongside the web half 52, as is clearly shown in FIG. 5. As the web half 51 is pulled into its position of FIG. 5 by the web half 52, it, in turn, draws the wall 14 rearwardly. In view of the angular relationship of the fold line 40 with respect to the extension of the fold line 36, the front wall 14 is drawn rearwardly to an upwardly and rearwardly sloping position, as is clearly shown in FIG. 6. At this time, the folded upper portions of the wall 17 and the web half 52 project through the notch 43 in the manner clearly shown in FIGS. 3, 4 and 5.

It will be readily apparent from FIG. 6 that the upper portion of the wall 17 and the web half 52 cannot project through the notch 43 unless there is a deflection of the lower part of the edge portions of the wall 17 and the web half 52. However, because of the cut line 47 and the fold lines 48 and 50, intermediate portions of the forward edge of the wall 17 and the web half 52 are free to be deformed by engagement with the wall 14, as is clearly shown in FIGS. 4 and 5. The deformed portions of the wall 17 and the web half 52 are identified by the numeral 60.

It will be readily apparent that once the web locks 32 and 33 are formed, the side walls 16 and 17 are locked against inward folding movement towards overlying positions with respect to the bottom wall 13. Since the side walls 16 and 17 must fold first, the front wall 14 cannot fold rearwardly. In a like manner, the rear wall 15 cannot fold forwardly, and accordingly, the bottom half 11 of the carton 10 remains erected when released.

It will also be readily apparent that the web locks 32 and 33 are automatically actuated when the bottom half 11 is erected in that when the side walls 16 and 17 are pulled to their upstanding positions, as described above, the web halves 51 draw the front wall 14 rearwardly and there is a snap interlock between the respective portions of the walls 14, 16 and 17. Therefore, the web lock is not only effective, when in its operative position, to hold the carton bottom half 11 open, but is automatically actuated during the erection of the carton.

Although only a preferred embodiment of the carton construction has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the carton construction without departing from the spirit of this invention.

I claim:

1. In a foldable carton having adjacent walls thereof defining a corner and being joined together by a folded web reversely folded upon itself and directly integrally connected to each of said walls along a respective fold line, a web lock in said corner for locking said web in a folded state with said adjacent walls being retained in a corner forming relation, and said web lock includes an opening in one of said walls and a portion of the other of said walls is positioned in said opening.

2. The foldable carton of claim 1 wherein said folded web draws the opening bearing portion of said one wall towards said other wall to retain said other wall portion in said opening.

3. The foldable carton of claim 1 wherein said folded web is folded alongside the other of said walls, and said web lock further includes hingedly joined together portions of said other wall and said folded web positioned in said opening.

4. The foldable carton of claim 1 wherein said folded web is folded alongside the other of said walls, and said web lock further includes hingedly joined together portions of said other wall and said folded web positioned in said opening, said folded web drawing the opening bearing portion of said one wall towards said other wall to retain said other wall portion in said opening.

5. The foldable carton of claim 1 wherein said walls are hinged to a common panel and have free edges remote from said panel, and said web lock is in the form of a notch in said one wall adjacent its free edge at said corner, said one wall slopes from said panel to said free edge generally towards the adjacent edge of said other wall, and said portion of said other wall projecting into said notch is adjacent its free edge.

6. The foldable carton of claim 5 wherein the edge portion of said other wall between said edge portion projecting into said notch and said panel is deformed by engagement thereof with said one wall.

7. The foldable carton of claim 6 wherein deformation of said deformed edge portion is facilitated by a cut line and a fold line formed in said other wall.

8. In a foldable carton having adjacent walls thereof defining a corner and being joined together by a folded web, a web lock in said corner for locking said web in a folded state with said adjacent walls being retained in a corner forming relation, said walls being hinged to a common panel and having free edges remote from said panel, and said web lock including a notch in one of said walls adjacent its free edge at said corner, said one wall sloping from said panel to said free edge generally towards the adjacent edge of the other of said walls, said folded web being disposed alongside said other wall, and joined together edge portions of said other wall and said folded web adjacent the free edge of said other wall projecting into said notch.

9. The foldable carton of claim 8 wherein the joined together edge portions of said other wall and said folded web between said edge portions projecting into said notch and said panel are deformed by engagement thereof with said one wall.

10. The foldable carton of claim 9 wherein deformation of said deformed edge portions is facilitated by cut lines and fold lines formed in said other wall and said folded web.

11. In a blank for a foldable carton, a foldable corner forming portion including a panel, first and second wall panels connected to said panel along adjacent edges thereof along first and second fold lines, and a foldable web disposed at a corner of said panel and connected to adjacent edges of said first and second wall panels along third and fourth fold lines, a diagonal fold line in said foldable web extending from said panel corner, said third fold line being a direct continuation of said second fold line, said fourth fold line being an angled extension of said first fold line and sloping towards said second panel to form projecting folded edge portions on said foldable web and said second wall panel when said blank is folded to form a carton, and said third fold line terminating in a cut line defining notch means in said first wall panel for receiving the projecting folded edge portions.

12. The carton blank of claim 11 wherein a cut line is formed in said foldable web and said second wall panel generally parallel to said second fold line, and converging fold lines are formed in said foldable web and said second wall panel extending from the ends of said cut line generally towards said panel to define deformable edge portions on said foldable web and said second wall panel.

13. The carton blank of claim 11 wherein the combined linear extent of said cut line and said third fold line is substantially equal to the linear extent of said fourth fold line.

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