United States Patent [19]

Manizza

[11] **3,734,391**

[45] **May 22, 1973**

[54] **CARTON WITH SHORTENED WEB CORNERS**

[75] Inventor: **Guelfo A. Manizza,** Blauvelt, N.Y.

[73] Assignee: **Continental Can Company, Inc.,** New York, N.Y.

[22] Filed: **Jan. 25, 1971**

[21] Appl. No.: **109,260**

[52] **U.S. Cl.**.....**229/31 R,** 229/35, 229/36

[51] **Int. Cl.**.....**B65d 5/22,** B65d 5/24

[58] **Field of Search**.....229/30, 31 R, 31 FS, 229/32, 33, 35, 36

[56] **References Cited**

UNITED STATES PATENTS

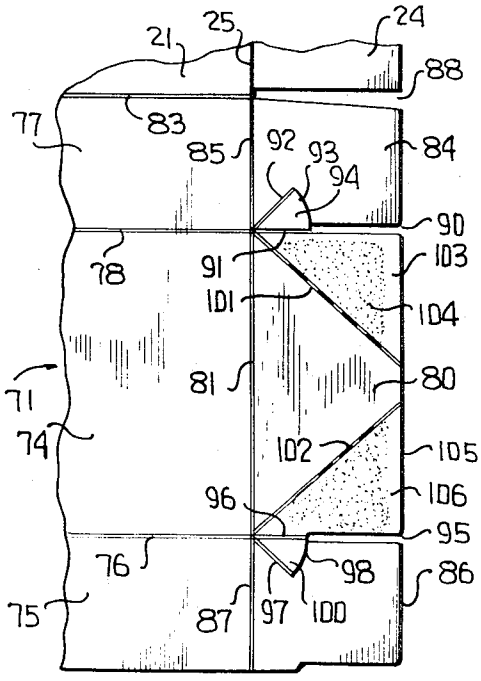
1,985,778	12/1934	Himes	229/31 R
2,161,675	6/1939	Hoag	229/31 R
2,889,102	6/1959	Wagaman	229/35 X
3,358,901	12/1967	Wainberg	229/35 X
3,450,330	6/1969	Pierce, Jr.	229/36 X
2,678,152	5/1954	Van der Lugt, Jr.	229/35

Primary Examiner—Samuel B. Rothberg
Assistant Examiner—Steven E. Lipman
Attorney—Diller, Brown, Ramik & Holt

[57] **ABSTRACT**

This disclosure relates to a collapsible carton having a leak-proof corner wherein the web or gusset defining the corner is foreshortened whereby the necessary seal adjacent the base of the carton is provided and at the same time the flap may be securely secured in place in conventional manners. Furthermore, where desired, the carton may be constructed so that the walls may be folded into superimposed relation with respect to the base and wherein hinging of the carton is in the area of the flaps so that the necessary hinge lines do not undesirably detract from the appearance of the carton.

16 Claims, 7 Drawing Figures



Patented May 22, 1973 3,734,391

2 Sheets-Sheet 1

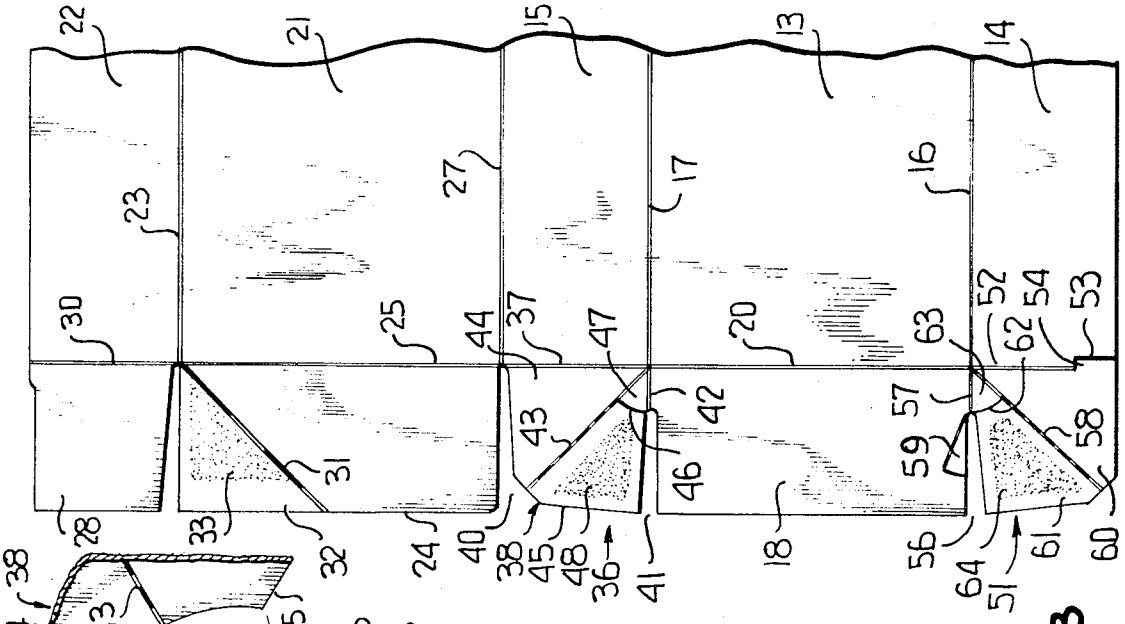


FIG. 3

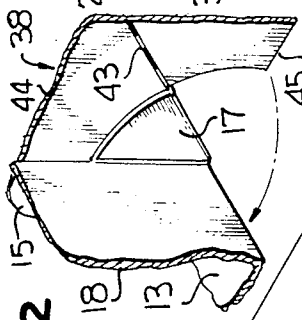


FIG. 2

FIG. 1

INVENTOR
GUELFO A. MANIZZA

By Dieter, Brown, Ramik & Holt
ATTORNEYS

FIG.6

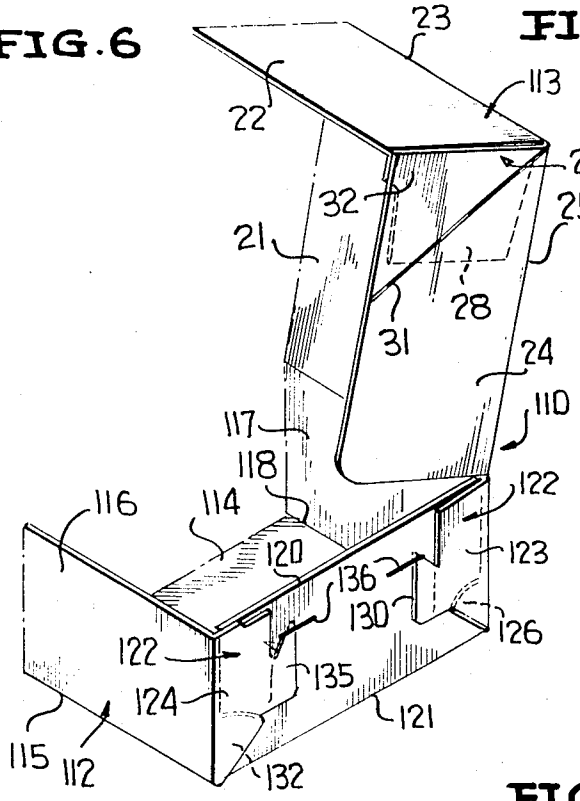


FIG.7

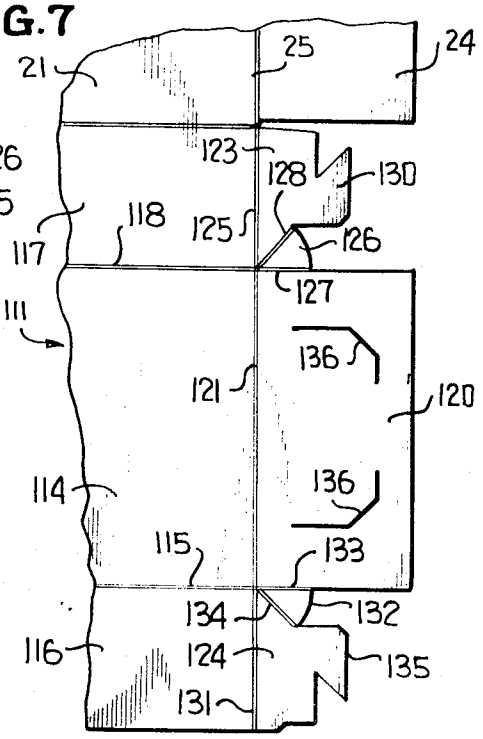


FIG.4

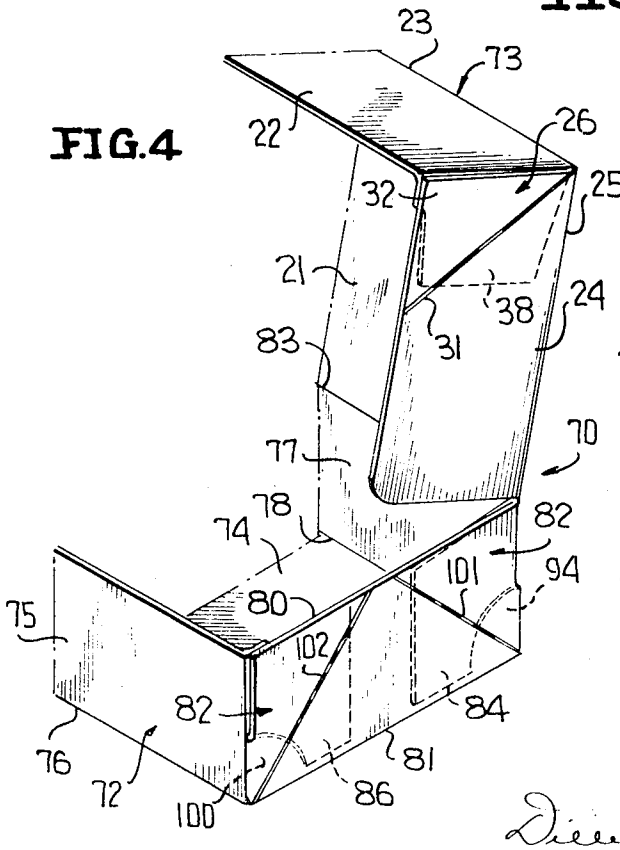
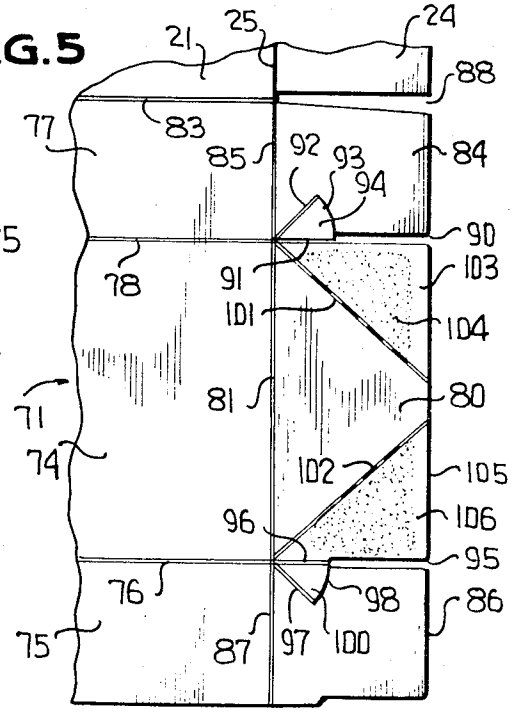


FIG.5



INVENTOR
GUELFO A. MANIZZA

By Dilleen, Brown, Ramik & Holt
ATTORNEYS

CARTON WITH SHORTENED WEB CORNERS

This invention relates in general to new and useful improvements in cartons, and more particularly to a collapsible carton having leak-proof corners and wherein the leak-proof corners are defined by shortened webs or gussets which in no way interfere with the securing together of the components of the carton at the corner and at the same time facilitate the provision of the necessary fold lines to permit the folding of the walls of the carton into superimposed relation with respect to the base with the fold lines lying in the area of the corner forming flaps of the carton.

BACKGROUND OF THE INVENTION

It is well known to form collapsible cartons which may have the walls thereof permanently secured together by means of flaps which are secured in place at the time of the making of the carton, after which the carton may be folded to a flat condition and ready for immediate setting up or erection. Such a collapsible carton is disclosed in the patent to Harold Riege, et al. U. S. Pat. No. 2,437,835, granted Mar. 16, 1948. However, an obvious deficiency of such carton is that the corners are not truly sealed and therefore, should the bottom portion of the carton contain any liquid, the liquid will run out through the corner constructions.

It is also well known to provide a knock down carton or box wherein the corners are sealed. In such carton construction, the flaps are integrally connected to adjacent side walls and a folded, intermediate gusset or web is disposed at the corner and makes the corner leak-proof. Such a carton is disclosed in the patent to Francis V. Powell, U. S. Pat. No. 1,190,797, granted July 11, 1916.

When it is desired to form a carton such as that disclosed in the Powell patent so that it may be collapsed in the manner disclosed in the Riege, et al. patent, hinge lines must be formed in the walls of the carton other than generally in alignment with the flaps so as to greatly detract from the appearance of the carton.

SUMMARY OF THE INVENTION

In accordance with this invention, it is proposed to form a carton having the general constructional characteristics of the carton of the Riege, et al. patent, but wherein in lieu of the flaps being entirely cut away from one of the walls at each corner, the flap is hingedly connected to one of the walls as taught by Riege, et al., and at the same time, the flap has a small portion thereof integrally connected to the other of the walls of the corner defining a short gusset or web which functions to seal the lower portion of the carton.

In accordance with this invention, while the shortened gusset or web serves to provide for the leak-proof construction of the carton, this permits sufficient flap material remaining for the securement of the flap material to the other carton wall whereby folding of the carton in the area of the flap to permit the walls to be folded into superimposed relation with respect to the carton base may be accomplished while maintaining the leak-proof characteristic of the carton.

In accordance with this invention, it is preferred that the necessary fold lines for effecting the folding of the walls of the carton into superimposed relation with respect to the base be formed in the flap for each corner of the carton whereby the necessary fold lines are incorporated in the flap area and the appearance of the carton is greatly improved while at the same time the carton has leak-proof corners.

When the carton is so constructed, the flaps, if desired, may be so secured to their respective walls whereby one wall of the carton, preferably the front wall, tilts back at a slight angle and this carton may be provided at the upper remote corners thereof with notches receiving projecting portions of the side walls of the carton so that when the carton is set up or erected, an interlock will be provided between the side walls and the front wall so as to maintain the carton in its set up position.

In another form of the carton, the necessary fold lines for effecting folding of the walls of the carton to superimposed relation with respect to the base are formed in those walls of the cartons to which the flaps are secured. Thus, the necessary fold lines are in the area of the flaps and in no way detract from the appearance of the carton.

In still another form of the invention, in lieu of permanently securing the flaps to the walls of the carton, a mechanical interlock is provided between the flaps and the carton walls. This permits the corners to be leak-proof while at the same time the flaps are disposed in face-to-face engagement with the respective walls of the carton for a major portion of the extent of the flaps.

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 carton formed in accordance with this invention.

FIG. **2** is an enlarged fragmentary perspective view of a corner portion of the carton showing the same in an initial folded relationship prior to the securement of the flap to the respective carton wall.

FIG. **3** is a fragmentary plan view of generally one half of the blank from which the carton of FIG. **1** is formed.

FIG. **4** is a fragmentary perspective view similar to FIG. **1** and shows a modified form of carton construction.

FIG. **5** is a fragmentary plan view of a blank from which the carton of FIG. **4** is formed.

FIG. **6** is a fragmentary perspective view of still another form of carton formed in accordance with this invention.

FIG. **7** is a fragmentary plan view of the blank from which the carton of FIG. **6** is formed.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIG. **1** a preferred form of carton formed in accordance with this invention, the carton being generally identified by the numeral **10**. Basically, the carton **10** includes a box portion **11** and a cover portion **12**, the cover portion **12** being integrally formed with the box portion **11** and being hingedly connected thereto.

The box portion **11** is generally rectangular in outline and includes a bottom wall or base **13** which has hingedly connected along the opposite longitudinal edges thereof a front wall **14** and a rear wall **15**, the front wall **14** being connected to the base **13** along a fold line **16** while the rear wall **15** is connected to the base **13** along a fold line **17**.

The box 11 also includes a pair of end walls 18 which are secured to the ends of the base 13 along fold lines 20. The end walls 18 are connected to the front wall 14 and the rear wall 15, which may be considered side walls, by corner constructions which will be discussed in further detail hereinafter.

The cover 12 includes a top wall 21 which has connected thereto a depending front wall 22 along a fold line 23. The cover 12 also includes a pair of end walls 24 which are connected to the top wall 21 along fold lines 25. Each end wall 24 is connected to the front wall 22 by means of a corner construction, generally identified by the numeral 26, which corner construction will be described hereinafter.

It will be readily apparent from FIG. 1 that the cover or closure 12 is integrally connected with the box 11. This connection is simply a fold line connection along a fold line 27 between the top wall 21 and the upper edge of the rear wall 15.

It will be seen that each corner 26 is formed by means of a generally rectangular flap 28 which is connected to a respective end of the front wall 22 along a fold line 30.

Each end wall 24 is provided with a diagonal fold line 31 which extends across the end wall 24 from the point of common intersection of the fold lines 23, 25 and 30, as is best illustrated in FIG. 3, and defines a panel portion 32 which is generally triangular in outline. The inner surface of the panel portion 32 is provided with a suitable adhesive coating 33 and when the walls 22 and 24 are disposed at right angles to the wall 21, and with the flap 28 folded inwardly of the respective end wall 24, the panel portion 32 is adhesively bonded to the flap 28 to form a permanent corner. At this time, it is pointed out that a portion of the flap 28 which is secured to its respective end wall 24 does not extend across the fold line 31.

It will be readily apparent from FIG. 1 that the front wall 22 and the end walls 24 may be readily folded into superimposed relation with respect to the top wall 21 by folding the end walls 24 along the fold lines 31. No folding of the flaps 28 occurs, the flaps 28 folding together with the panel portions 32.

The end walls 18 are connected to the rear side wall 15 by identical corner constructions, generally identified by the numeral 35. With reference to the blank, generally identified by the numeral 36, of FIG. 3, it will be seen that connected to the end of the rear side wall 15 along a fold line 37 is a flap 38. The flap 38 is generally rectangular in outline.

The flap 38 is separated from the end wall 24 by a cut-out 40 and from the end wall 18 by a notch 41. The cut-out 40 extends entirely to the fold line 37 while the notch 41 terminates remote from the fold line 37 with the flap 38 being connected to the end wall 18 along a fold line 42 which is a continuation of the fold line 17.

The flap 38 is also provided with a diagonal fold line 43 which extends from the intersection of the fold lines 17, 20 and 37 and divides the flap 38 into two generally triangular panel portions 44 and 45. The panel portion 45 is, in turn, provided with an arcuate cut line 46 which separates therefrom a triangular web or gusset 47. The gusset or web 47 is defined by the fold lines 42 and 43 of the cut line 46.

It is to be noted that the triangular panel portion 45, outwardly of the cut line 46, is provided with a suitable adhesive coating 48 on the inner surface thereof.

Referring now to FIG. 2, it will be seen that when the box 11 is erected and the walls 15 and 18 are disposed in upstanding relation with respect to the base 13, initially the flap 38 will project downwardly as an extension of the rear side wall 15 but with the gusset 47 being folded back upon the triangular portion 44. The flap 38 may now be folded relative to the rear wall 15 along the fold line 37 as the triangular portion 45 thereof adhesively bonded to the exterior surface of the end wall 18.

The front side wall 14 is secured to the end walls 18 by a corner construction which is generally identified by the numeral 50 and which is slightly different from the corner construction 35. The corner construction 50 is primarily defined by a flap which is generally identified by the numeral 51 and is generally rectangular in outline. It is to be noted that the flap 51 is carried by the front side wall 14 and is hingedly connected thereto along a hinge line 52. The hinge line 52 terminates remote from, but adjacent to the free edge of the blank 36 in an L-shaped cut line 53 which defines a projecting ear 54 on the flap 51 and a notch 55 in the front wall 14.

The flap 51 is primarily separated from the end wall 18, in the blank form, by a trapezoidal cut-out 56 with the flap 51 being hingedly connected to the end wall 18 inwardly of the cut-out 56 along a short fold line 57 which is a continuation of the fold line 16.

The flap 51 is provided with a diagonal fold line 58 which extends from the inner section of the fold lines 16, 20, 52 and 57. The fold line 58 divides the flap 51 into triangular portions 60 and 61. The triangular portion 61, in turn, is provided with an arcuate cut line 62 which extend between the fold lines 57 and 60 and defines a triangular gusset or web 63 which is short as compared to the width of the end wall 18. The triangular panel portion 61 outwardly of the cut line 62 is provided with an adhesive coating 64.

It will be readily apparent that when the box is erected, a folding of the flap 51 will be effected similar to that shown with respect to the flap 38 in FIG. 2. However, because of the trapezoidal cut out 56, when the flap 51 is brought into proper position, the front side wall 14 is caused to slope rearwardly towards the rear wall 15 so as to assure the interlock of the projecting portion of each end wall 18 in the associated notch 55. If desired, a triangular front edge portion 59 of each end wall 18 may be constructed to fold out of the way in the manner disclosed in my U.S. Pat. No. 3,655,115 granted Apr. 11, 1972. It is to be understood that the panel portion 61 will be adhesively secured to the exterior surface of the end wall 18.

It will be readily apparent that the shortened web or gusset 63, which is folded between the flap 51 and the associated end wall 18 will serve to seal the forward corners of the box 11, and the gussets 63, in association with the gussets 47, provides for a leak-proof corner construction at each of the four corners of the box 11.

It will also be readily apparent that by folding the flaps 38 and 51 along their respective fold lines 43 and 58, the end walls 18 may be folded inwardly towards each other in overlying relation to the base 13 and with the side walls 14 and 15 folding in overlying relation thereto and to the base 15 so that the box 10 may be collapsed to a substantially flat state. It is also to be noted by incorporating the fold lines in the flaps, no fold lines are required in any of the end or side walls of

the box, thereby retaining the pleasing appearance of the box.

Reference is now made to FIGS. 4 and 5 wherein there is illustrated a modified form of carton, which is identified by the numeral 70 and which carton is formed from a modified form of blank, which blank is identified by the numeral 71. The carton 70, like the carton 10, includes a box portion 72 and a closure or cover portion 73. The closure portion 73 will be constructed identical to the closure 12 of the box 10 and further description thereof will be unnecessary and like numerals will be applied thereto.

The box 72 includes a base or bottom wall 74 which has extending upwardly from the forward edge thereof a front side wall 75 which is connected to the base 74 along a fold line 76. A similar rear side wall 77 extends upwardly from the rear edge of the base 74 and is connected thereto along a fold line 78. At the opposite ends of the base 74 there are upstanding end walls 80, each of which is hingedly connected to the base 74 along a fold line 81. Each end wall 80 is connected to the side walls 75 and 77 by leak-proof corners in accordance with this invention, the corners being generally identified by the numeral 82. It is also to be noted that the cover 73 is connected to the box 72 along a fold line 83 extending between the top wall 21 and the rear side wall 77.

In order to form the corners 82 at each end of the box 72, the blank 71 includes a generally rectangular flap 84 which is hingedly connected to the side wall 77 along a fold line 85, and a generally rectangular flap 86 which is hingedly connected to the side wall 76 along a fold line 87. The flap 84 is separated from the end wall 24 by a cutout 88 and from the end wall 80 by a partial cutout 90. The flap 84 is hingedly connected to a portion of the end wall 80 along a fold line 91 which is an extension of the fold line 78. The flap 84 is further provided with a short diagonal fold line 92 and an arcuate cut line 93 which extends between the remote ends of the fold lines 91 and 92. The fold lines 91 and 92 and the cut line 93 define a generally triangular gusset or web 94 which is short as compared to the length of the flap 84.

The flap 86 is disposed at a free end of the blank 71 and is separated from the adjacent end wall 80 by a partial notch 95. The flap 86 is hingedly connected to the end wall 80 by a short fold line 96 which extends as an extension of both the notch 95 and the fold line 76. The flap 86 is further provided with a diagonal fold line 97 and an arcuate cut line 98 which extends between the remote ends of the fold lines 96 and 97. The fold lines 96 and 97 and the cut line 98 combine to define a relatively short web or gusset 100 which is triangular in outline.

At this time it is also pointed out that the end wall 80 is provided with a pair of outwardly converging diagonal fold lines 101 and 102. The fold line 101 extends from the intersection of the fold lines 78,81,85 and 91 while the fold line 102 extends from the intersection of the fold lines 76, 81, 87 and 96. It is to be noted that the fold line 101 sets off a triangular panel portion 103 which is provided with an adhesive coating 104. In a like manner, the fold line 102 sets off a triangular panel portion 105 which is provided with an adhesive coating 106.

In the formation of the box 72, the side walls 75 and 77 and the end walls 80 are folded to upstanding positions in the manner generally described in the formation of the box 11, but with the flaps 84 and 86 folded into the interior of the box, as is clearly shown in FIG. 4. Thereafter, the flaps are adhesively bonded to the respective triangular portions of the respective end wall 80 outwardly of the fold lines 101 and 102 formed therein. It will be readily apparent that the gussets 94 and 100 function to completely seal the lower portions of the corners 82 so as to make the box leak-proof. At the same time, the flaps 84 and 86 may be readily securely bonded to the end walls 80.

The cover 73 may be collapsed to a relatively flat state by folding of the fold lines 31 in the manner described with respect to the cover 12. In a like manner, the box 72 may be folded to a relatively flat state by folding the end walls 80 along the fold lines 101 and 102. It will be seen that the end walls 80 will be folded flat in superimposed relation with respect to the base 74 and with the flaps 84 and 86 overlying the end walls 80. Side walls 75 and 77 will be also folded flat partially in overlying relation with respect to the end walls and partially in direct overlying relation with respect to the base 74.

Reference is now made to FIGS. 6 and 7 wherein there is illustrated in FIG. 6 a modified carton construction, generally identified by the numeral 110, and in FIG. 7 a blank 111 for forming the carton 110. The carton 110 includes a box portion 112 and a cover or closure portion 113. The cover 113 will be of an identical construction to the cover 12 and like parts thereof will be identified by like reference numerals.

The box 112 includes a base or bottom wall 114 having hingedly connected to the forward edge thereof along a fold line 115 an upstanding front side wall 116. A rear side wall 117 extends upwardly from the rear edge of the base 114 and is hingedly connected thereto along a fold line 118. At the opposite ends of the base 114 there are upstanding end walls 120 which are hingedly connected to the base along fold lines 121. In accordance with this invention, the end walls 120 are connected to the side walls 115 and 117 by means of leak-proof corners, generally identified by the numeral 122.

The corners 122 are formed by flaps 123 and 124 which are of like construction. The flap 123 is hingedly connected to the side wall 117 along a fold line 125 and has an inner portion thereof in the form of a short web or gusset 126 of a triangular configuration. The web or gusset 126 is hingedly connected to the adjacent end wall 120 along a fold line 127 which may be considered to be an extension of a fold line 118. The gusset 126 is also hingedly connected to the flap 123 along a diagonal fold line 128. Remote from the fold line 125, the flap 123 is provided with a latch element 130.

The flap 124 is carried by the front side wall 116 and is hingedly connected thereto along a fold line 131. The flap 124 has formed as part thereof a short triangular gusset or web 132 which is hingedly connected to the adjacent end wall 120 along a fold line 133 which may be considered a continuation of the fold line 115. The gusset 132 is also hingedly connected to the flap 124 along a diagonal fold line 134. Further, the flap 124 is provided with a latch member 135 which projects outwardly therefrom.

In order to facilitate the interlocking of the latch members 130 and 135 with the respective end wall 120, each end wall 120 is provided with a pair of opposed

angular cutouts **136.** These cutouts are configurated to receive in an interlocking manner the latch members **130** and **135.**

In the formation of the box **112,** the side walls **116** and **117** are brought into upstanding relation together with the end walls **120.** The flaps **123** and **124** are then folded alongside the end wall **120** and the latch elements **130** and **135** thereof are engaged with the openings defined by the cut lines **136** in the end wall **120.** It is to be noted that the gussets **126** and **132** will be reversely folded beneath the respective flaps so as to make certain that the corners **122** are of a leak-proof construction.

No attempt has been made to illustrate the opposite end of the carton **110.** If desired, it may be identical to the illustrated end. On the other hand, it is feasible that the opposite end of the carton may be of a construction such as that of the box **11** of FIG. **1** or the box **72** of FIG. **4.** Should the carton be so constructed, it will be seen that the carton may be partially glued together and thereafter folded flat, and when it is desired to utilize the carton, it is merely necessary to erect the same and then fold the flaps **123** and **124** in place and engage the latch members **130** and **135.**

It will be readily apparent that in accordance with this invention there may be provided cartons having leak-proof corners with the leak-proofing of the corners being of the necessary height although they are not full height. At the same time, the cartons may be so constructed whereby they may be at least partially, if not completely, and thereafter shipped and stored flat and ready for set up or erection with a minimum of effort.

Although only several preferred embodiments of cartons in corner constructions formed in accordance with this invention have been specifically illustrated and described herein, it is to be understood that minor variations may be made in the corner and carton constructions without departing from the spirit and scope of the invention, as defined by the appended claims.

I claim:

1. A collapsible carton having leak-proof corners comprising a base panel and upstanding side and end panels hingedly connected to said base panel along the periphery thereof, and a corner forming flap joining adjacent ones of said side and end panels at at least two adjacent ones of said corners, each flap having one edge integrally hingedly connected to a respective one wall of said side and end panels, each flap including a gusset connected to said one wall only through said flap and integrally connected to said other wall and sealing said corner at least adjacent said base, said flap being in planar face-to-face contact with said other wall for substantially more than one half of the area of said flap, and securing means between said flap and said other wall maintaining said corner.

2. The carton of claim **1** wherein said securing means are lock means separate and apart from said gusset for retaining said carton in a set up position.

3. The carton of claim **1** wherein said fold means are disposed intermediate said gusset and the point of securement of said flap to said other wall.

4. The carton of claim **1** wherein said fold means are disposed to one side of said gusset and said point of securement of said flap to said other wall.

5. The carton of claim **1** wherein said fold means are disposed on said flap intermediate said gusset and said point of securement of said flap to said other wall.

6. The carton of claim **5** wherein said fold means divides said flap into two parts, and said gusset is formed from that part of said flap secured to said other wall.

7. The carton of claim **1** wherein said fold means are disposed on said other wall intermediate said gusset and the point of securement of said flap to said other wall.

8. The carton of claim **1** wherein said securing means are lock means for retaining said carton in a set up position, said lock means including a notch formed in said one wall adjacent said flap and said other wall having a portion projecting into said notch to support said corner.

9. The carton of claim **1** wherein said gusset is planar in said carton and lies between said flap and said other wall.

10. The carton of claim **1** wherein all of said flap including said gusset projects from said one wall and overlaps said other wall.

11. The carton of claim **1** wherein said gusset is connected to the remainder of said flap along a fold line and said gusset is otherwise free of fold lines.

12. The carton of claim **1** wherein said gusset is between said other wall and the remainder of said flap.

13. The carton of claim **1** wherein said flap with the exception of said gusset is initially separate from and spaced from said other wall, and the connection between said flap and said other wall is other than an integral connection.

14. A collapsible carton having leak-proof corners comprising a base panel and upstanding side and end panels hingedly connected to said base panel along the periphery thereof, and a corner forming flap joining adjacent ones of said side and end panels at at least two adjacent ones of said corners, each flap having one edge integrally hingedly connected to a respective one wall of said side and end panels and a portion of said flap remote from said one edge being secured to the other wall of said respective side and end walls, each flap including a gusset connected to said one wall only through said flap and integrally connected to said other wall sealing said corner at least adjacent said base, said flap to the exclusion of said gusset being formed of a first part and a second part connected together along a fold line and said gusset being directly connected to only said first part and along a continuation of said flap fold line.

15. The carton of claim **14** wherein said first part includes said edge integrally connected to said one wall, and said second part is initially free of said other wall.

16. The carton of claim **15** wherein said first and second parts overlap said other wall, and only said second part is directly connected to said other wall.

* * * * *