Aug. 30, 1966 A. J. WEISS 3,269,531

CARTON

Filed April 17, 1964 2 Sheets-Sheet 1

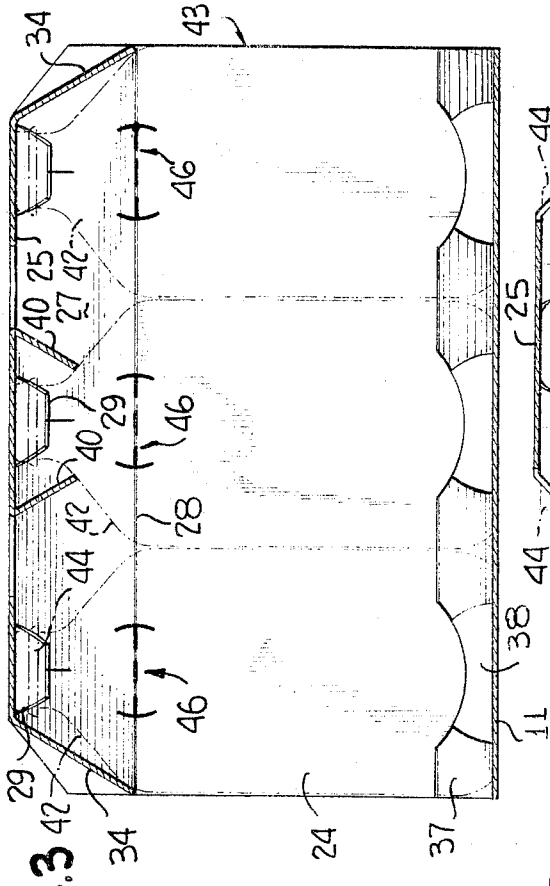


FIG. 3

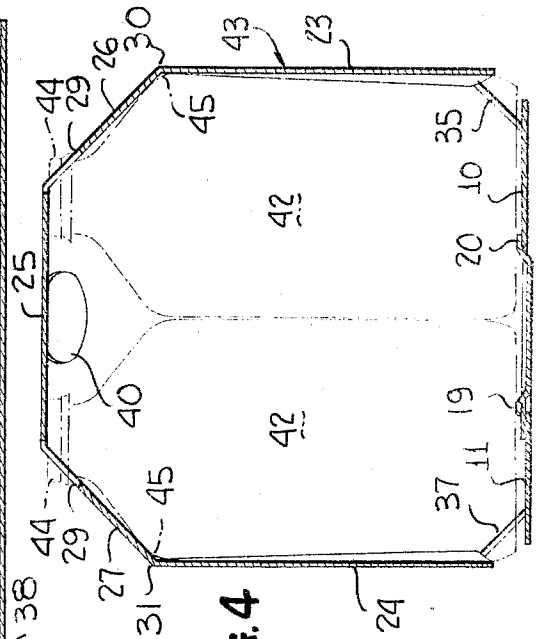


FIG. 4

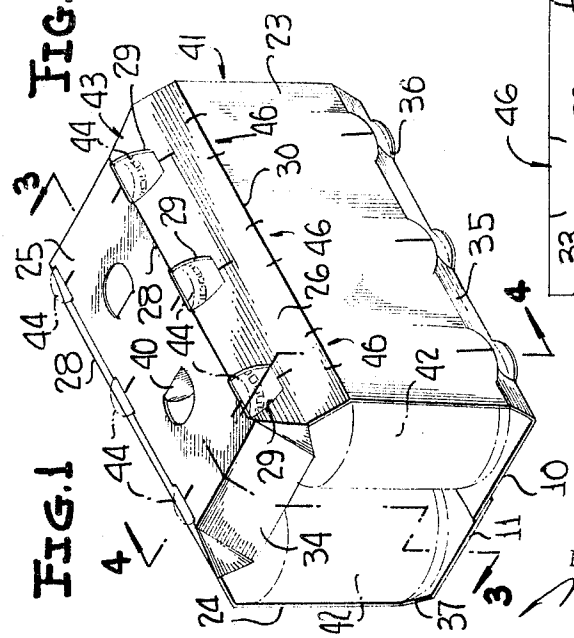


FIG. 1

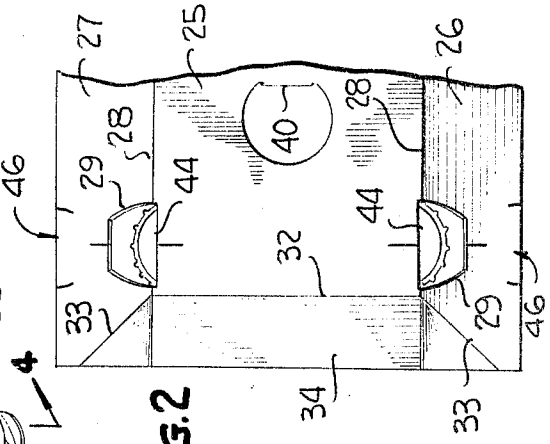


FIG. 2

INVENTOR
ARTHUR J. WEISS

BY Mason, Porter, Miller & Stewart
ATTORNEYS

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CARTON

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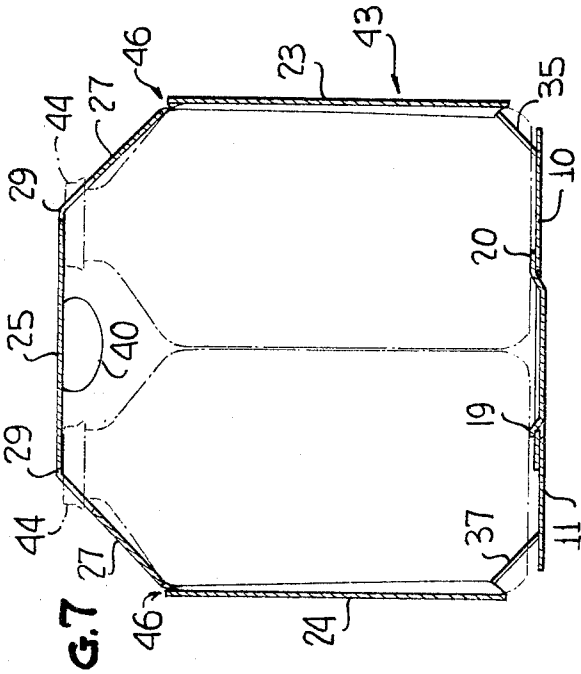


FIG. 7

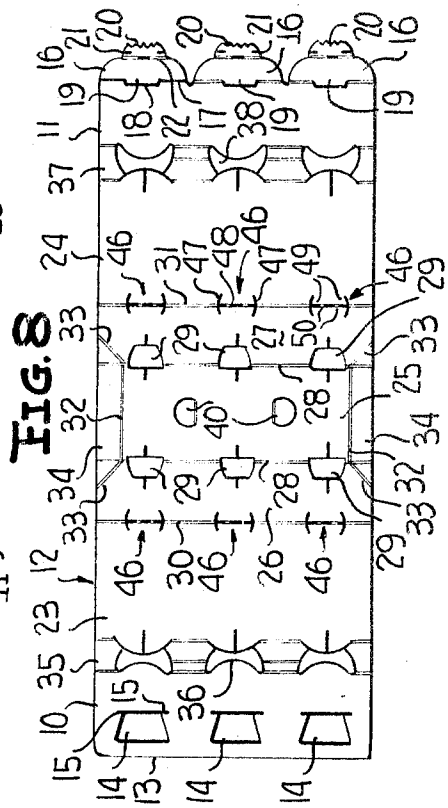


FIG. 8

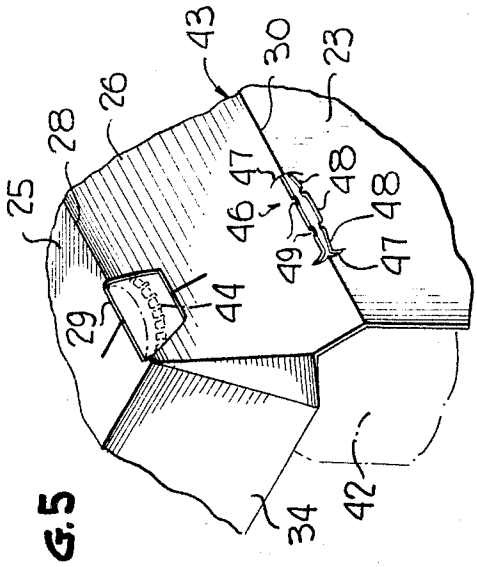


FIG. 5

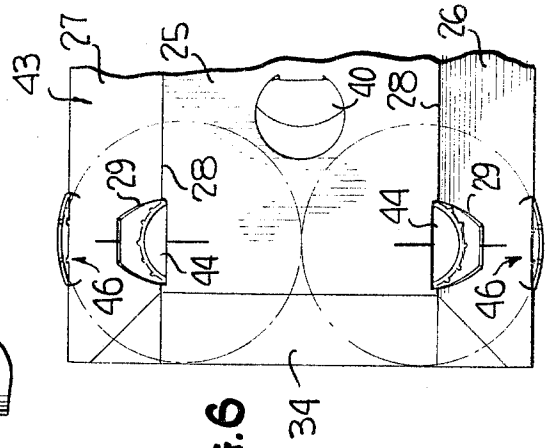


FIG. 6

INVENTOR
ARTHUR J. WEISS

BY Mason, Porter, Miller & Stewart
ATTORNEYS

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CARTON

Arthur J. Weiss, Bergenfield, N.J., assignor to Continental Can Company, New York, N.Y., a corporation of New York

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14 Claims. (Cl. 206—65)

This invention relates in general to new and useful improvements in carton structures, and more specifically to a novel carton of the wrap-around type.

Many products which are distributed in individual containers, either bottles or cans, are being packaged in multiples in the form of readily handleable packages. The packages are formed by placing the containers in one or more rows and wrapping a carton thereabout with the terminal ends of the carton being automatically secured together in a manner wherein the carton tightly engages the containers and forms therewith a rigid readily handleable package. Machinery has been developed for automatically positioning the carton blanks relative to the containers and wrapping the carton blanks around the containers in the necessary manner to present terminal portions of the carton blanks in positions where they can be properly secured together while the carton snugly engages the containers being packaged. However, in order to assure a tight package, the machinery for wrapping the carton around the containers must be accurately constructed to function with respect to containers of a predetermined size. When the containers are oversized, the usual wrap-around carton will be distorted and will not wrap properly around the containers with the result that the proper connection cannot be formed between the terminal portions of the carton.

In view of the foregoing, it is the primary object of this invention to provide a carton of the wrap-around type with expansion formations of a construction wherein when the containers being packaged are of the predetermined size for which the carton is originally intended, the carton may be snugly wrapped around the containers without any weakening thereof due to the expansion formations and the expansion formations play no part in the final package, while at the same time, if one or more of the containers being packaged should be oversized, then the expansion formations will allow the necessary expansion of the carton to accommodate the oversize container or containers.

In a normal package formed of a plurality of containers in a wrap-around carton, the containers have upper shoulders which are engaged by upper corners of the carton. In accordance with this invention, it is proposed to provide the upper corners of the carton with expansion formations whereby when the containers being packaged are of the size for which the carton is intended, there will be no pressure exerted on the corners of the carton sufficient to rupture the expansion formations, but when one or more of the containers are oversized, in order that the carton may be properly drawn about the containers to form the necessary lock between terminal portions of the carton, sufficient pressure will be exerted by the carton on the shoulders of the containers to effect a slight rupturing of the carton in the expansion formation which engages the oversized container so as to allow a portion of the oversized container to project through the carton and compensate for the increase in size of the container.

A further object of this invention is to provide a novel expansion formation in a carton of the wrap-around type, the expansion formation being adapted to engage a shoulder of a container and when the container is oversized to permit the rupturing of the carton and the projection of the container through the carton so that the oversized

container will in no way interfere with the complete and proper wrapping around of the carton with respect to the containers and the formation of the necessary lock between terminal portions of the carton.

Still another object of this invention is to provide an extremely simple, yet efficient, expansion formation for use in cartons to compensate for variation in container size above a predetermined container size, the expansion formation being generally H-shaped and being disposed along a fold line of the carton at a corner of the carton which engages container shoulders, the H-shaped formation including two generally upstanding cuts and a cross bar which is in the form of a plurality of spaced nicks or notches along the fold line to effect a weakening of the carton along the fold line.

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:

FIGURE 1 is a perspective view of a package utilizing the carton which is the subject of this invention wherein the containers within the carton are of the predetermined size for which the carton was intended.

FIGURE 2 is an enlarged fragmentary top view of the carton of FIGURE 1 and shows the general details thereof.

FIGURE 3 is an enlarged longitudinal vertical sectional view taken through the carton of FIGURE 1 and shows further the details thereof.

FIGURE 4 is an enlarged transverse vertical sectional view taken along the line 4—4 of FIGURE 1 and shows the specific cross section of a wrap-around carton, the specific phantom showing of the bottles illustrating the relationship of the bottles with respect to the carton.

FIGURE 5 is an enlarged fragmenary top perspective view of one corner of a package wherein one of the bottles is oversized and the carton is sprung open along the expansion formation thereof to compensate for the oversize of the bottle.

FIGURE 6 is a fragmentary plan view similar to FIGURE 2 and shows the manner in which the expansion formation compensates for a slight increase in size of the bottle.

FIGURE 7 is a transverse vertical sectional view similar to FIGURE 4 and shows the manner in which the increased pressure on the carton at the corners thereof engaging the shoulders of the bottles results in the opening of the carton along the expansion formations thereof to compensate for the oversize of the bottles.

FIGURE 8 is a plan view on a reduced scale of a blank for forming a carton incorporating the expansion formations of this invention.

In the formation of packages of the readily handleable type from a plurality of containers and a carton of the wrap-around type, the containers are placed in one or more rows after which the central portion of the carton is engaged with the then upper ends of the containers. The carton is then tightly wrapped down and around under the containers followed by the formation of a joint between the terminal ends of the carton. It will be readily apparent that since the package must be one which may be readily handled, the carton must snugly engage the containers and form interlocks with the containers to prevent the accidental removal of the containers during handling. In view of this, each carton is of a predetermined size for receiving containers of a predetermined size. However, due to irregularities in manufacture containers are not always of the prescribed size and are frequently oversized. When the containers are oversized,

then there is a further distance about which the carton must wrap with the result that the connection between the terminal portions of the carton either is not formed properly or cannot be formed. This is particularly true in a carton construction wherein the connection between the terminal portions is formed by a plurality of locking tabs. In accordance with this invention, it is proposed to provide cartons of this general class with expansion formations whereby when the cartons are wrapped around containers of which one or more are slightly oversized, the carton can open up and the oversized container may project therethrough so that the necessary lock between the terminal portions of the carton may be obtained irrespective of the nature of the lock.

Although this invention is not limited to any specific type of carton interlock construction, there is illustrated in the drawings of this application a carton construction of the locking tab type which can utilize to the best advantage the expansion formation of this invention. This carton has one wall thereof which opposes ends of containers and is formed of two panels, such as the panels **10** and **11** illustrated in the blank shown in FIGURE 8, the blank being generally referred to by the numeral **12**. In the forming of a package from the carton blank **12**, terminal edge portions of the panels **10** and **11** are disposed in overlapping relation and are locked together. In order to facilitate the locking together of the overlapping edge portions of the panels **10** and **11**, the panel **10** is provided adjacent a free edge **13** thereof with a plurality of latch openings **14**, there being one latch opening **14** for each container in a row of containers for which the carton blank **12** is designed. The latch openings **14** are generally trapezoidal in outline and have narrow sides disposed remote from the edge **13** of the panel **10**. If desired, the latch openings **14** may be provided with slits **15** extending from opposite ends of the narrow side thereof.

The terminal edge of the panel **11** is provided with a plurality of latching flaps **16** which are hingedly connected to the panel **11** along a fold line **17** and which are disposed in aligned relation with an associated one of the latch openings **14**. Each fold line **17** is interrupted by a centrally located C-shaped cut **18** which defines a catch **19** that is pivotal with the latching flap **16**.

Each latching flap **16** is a projecting tongue **20** having opposed slits **21** formed therein.

In the forming of the connection between the panels **10** and **11** after the carton formed from the carton blank **12** is wrapped around a plurality of containers, the panel **11** is folded beneath the panel **10** and the latching flaps **16** are pivoted with respect to the panel **11** along the fold lines **17** to positions wherein the pivotal catches **19** are engaged within the latch openings **14**. The latching flaps **16** are then pivoted towards the plane of the panel **10** and serve to draw the panels **10** and **11** together. At this time the tongues **20** are disposed in angular relation to the locking flaps **16** by being folded relative thereto along the fold lines **22** disposed along the connections between the tongues **20** and the locking flaps **16**. The tongues **20** may now be inserted through the remote ends of the latch openings **14** with the tongues **20** passing down through the slits **15** and the slits **15** of the panel **10** cooperating with the slits **21** of the tongues **20** to lock the tongues **20** in place.

It will be readily apparent that when a carton, such as the carton formed from the blank **12** is wrapped around containers of a size larger than that for which the carton is intended the carton will not reach around the containers sufficiently for the pivotal catches **19** to be initially engaged within the latch openings **14**. When this occurs, the necessary connection between the panels **10** and **11** cannot be made and thus the resultant package is not properly formed.

The illustrated carton blank **12** is intended for use in forming a package of six bottles. Although this invention is not limited to such a package, the further details of the carton blank **12** will be described here solely for the purpose of providing for a full understanding of the invention. The blank **12**, in addition to the panels **10** and **11**, includes a pair of identical side panels **23** and **24** which are disposed on opposite sides of a panel formation which defines the top wall of a carton. This panel formation includes a centrally located top wall panel **25** and two outer panels **26** and **27** which are connected to the panel **25** along fold lines **28** which extend transversely of the blank **12**. Suitable openings **29** are formed in the blank **12**, along the fold lines **28** for the reception of crown caps of bottles in a manner to be described hereinafter. The panel **26** is connected to the panel **23** along a transverse fold line **30** while the panel **27** is connected to the panel **24** along a transverse fold line **31**.

The top wall panel formation also includes a pair of longitudinal fold lines **32** which extend generally between the fold lines **28** adjacent the edges of the blank **12**. In addition, diagonal fold lines **33** extend from the intersections of the fold lines **28** and **30** to the edges of the blank **12**. The fold lines **32** and **33** set off flaps **34** which may be folded downwardly at the opposite ends of the carton which is formed from the blank **12**.

The panel **10** is connected to the panel **23** by a connecting panel **35** which is provided with a suitable opening arrangement **36** for the reception of lower corner portions of bottles. A similar panel arrangement **37** connects the panel **11** to the panel **24**. The panel **37** also has bottle receiving opening formations **38** therein.

In order to facilitate the carrying of a package formed from the carton blank **12**, the panel **25** is provided with suitable flaps **40** which may be pushed inwardly to define two finger receiving openings. The flaps **40** are positioned to be disposed centrally between four adjacent bottles disposed within the resultant package.

Referring now to FIGURES 1, 2, 3 and 4 in particular, it will be seen that there is illustrated a package formed utilizing the carton blank **12**, the package being generally referred to by the numeral **41**. The package **41** includes six like bottles **42** arranged in two rows of three bottles each and a carton, generally referred to by the numeral **43** which is formed from the carton blank **12**.

It is to be noted that each of the bottles **42** is provided with a crown cap closure **44**. It is also to be noted that the width of the panel **25** is such that the inner edges of the openings **29** are disposed substantially along the center of each associated crown cap **44**. The panel **25** is disposed in horizontal relation while the panels **26** and **27** slope downwardly so that the crown caps **44** project out through the openings **29** in the manner best shown in FIGURE 4. This provides the necessary interlock between the upper ends of the bottles **42** with the carton **43**. It is to be noted that the lower portions of the bottles **42** project out through the opening formations **36** and **38** of the panels **35** and **37**, respectively, to provide interlocks between the bottoms of the bottles **42** and the carton **43**.

The carton **41**, as is illustrated in FIGURES 1 through 4 and described above, is one which may be formed with six bottles of a predetermined size utilizing the carton blank **12**. It is to be noted that the panels **24** and **27** on one hand and the panels **23** and **26** on the other hand define corners at their intersections along the fold lines **31** and **30** respectively. These corners of the carton **43** snugly engage the shoulders **45** of the bottles **42** and form a tight package.

It will be readily apparent that when the bottles **42** are properly sized, the package **41** may be readily formed by automatic machinery. However, should one or more of the bottles **42** be slightly oversized, either as to diameter or as to height, then the machinery normally cannot pull sufficiently the carton **43** around the bottles to the extent necessary to form the interlock between the panels **10** and **11**. In order to compensate for the possibility that one or

more of the bottles being packaged is oversized and at the same time to assure that a tight package will be obtainable with conventional size bottles, the carton **43** is provided with a plurality of expansion formations each of which is generally referred to by the numeral **46**. Each expansion formation **46** is generally H-shaped in outline and is disposed in alignment with the openings **29** so as to be aligned with the bottles **42**. Furthermore, each expansion formation **46** is centered along a respective one of the fold lines **30** and and **31**.

Each expansion formation **46** includes two generally upstanding side cuts **47** which are in opposed relation and are generally C-shaped in outline. The H-shape formation **46** also includes a cross bar **48** which is formed of a plurality of nicks or notches **49** which extend along the respective fold line and which are separated by bridge portions **50** which are rupturable.

When one or more of the bottles **42** are oversized and the carton **43** is applied in the normal manner, as the carton **43** is drawn down and around the bottles, the tension applied to the carton will be sufficient to effect a tight engagement of the corner portions of the carton with the shoulders **45** of the bottles so that when the carton **43** engages the oversized bottle **42**, the expansion formation **46** will have an extraordinary stress placed thereupon and rupture of the bridge portions **49** will occur, as is shown in FIGURES 5, 6 and 7. The opening of the carton **43** in the expansion formation area permits the shoulder portion **45** of the oversized bottle to project slightly out through the upper portion of the carton **43** and thereby in effect permits stretching of the carton. The stretching of the carton at an expansion formation **46** which has been ruptured, as is shown in FIGURE 5, is sufficient to compensate for the oversize of the associated bottle **42** with the result that the panels **10** and **11** may be locked together in the normal manner.

It will be readily apparent that since there is one expansion formation **46** for each bottle of the package **41**, the construction of the carton **43** will compensate for the existence of one or more oversized bottles **42** and will be ruptured at its expansion formations **46** accordingly.

Although only a preferred embodiment of the invention has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the details of the expansion formation within the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. In a wrap-around carton particularly adapted for normally snugly receiving a plurality of containers of a predetermined size and having securing means for locking said carton about the containers, normally unbroken and closed rupturable expansion means for rupturable opening only when a slightly oversize container is positioned within the carton, and enabling the carton to receive the oversize container without increasing the overall size of the carton.

2. In a wrap-around carton particularly adapted for snugly receiving a plurality of containers of a predetermined size and of the type having a panel lock for securing together free ends of the carton when the carton is snugly wrapped around containers, normally unbroken and closed rupturable expansion means for opening only when a slightly oversize container is positioned within the carton to permit securement of the panel lock.

3. In a wrap-around carton particularly adapted for snugly receiving a plurality of containers of a predetermined size and having securing means for locking said carton about the containers, and of the type having an upper shoulder and wherein said carton has opposite portions configurated to be snugly engaged with shoulders of normal size containers normally unbroken and closed rupturable, expansion formations in said carton portions in alignment with intended positions of containers within said carton, each of said expansion formations being rupturable to open when a slightly oversized container is positioned within said carton in alignment therewith.

4. The carton of claim **3** wherein said securing means are in the form of a panel lock for securing together free ends of said carton when said carton is snugly wrapped around normal size containers, and said expansion formations permit the engagement of said panel lock even when oversized containers are placed within said carton.

5. A wrap-around carton for snugly receiving a plurality of containers of a predetermined size, said carton including a pair of side panels, and a pair of container end opposing panels, one of said container end opposing panels being connected to said side panels along longitudinal fold lines, and said carton having normally unbroken and closed rupturable expansion means along said longitudinal fold lines for automatically opening only upon the reception of an oversize container in said carton, the other of said container end opposing panels being formed of two terminal panel portions connected together by panel locking means.

6. The carton of claim **1** wherein said expansion means is disposed along a fold line and is generally H-shaped in outline, said expansion means including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions.

7. The carton of claim **1** wherein said expansion means is disposed along a fold line and is generally H-shaped in outline, said expansion means including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions, and said upright cuts being of an opposed generally C-shape.

8. The carton of claim **5** wherein each of said expansion means is centered on its respective fold line and is generally H-shaped in outline, each of said expansion means including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions.

9. The carton of claim **5** wherein each of said expansion means is centered on its respective fold line and is generally H-shaped in outline, each of said expansion means including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions, and said upright cuts being of an opposed generally C-shape.

10. In a carton blank including a pair of adjacent panels joining along a fold line, and an expansion formation disposed along said fold line and being generally H-shaped in outline, said expansion formation including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions.

11. In a carton blank including a pair of adjacent panels joined along a fold line, and an expansion formation disposed along said fold line and being generally H-shaped in outline, said expansion formation including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions, and said upright cuts being of an opposed generally C-shape.

12. A blank for a carton of the wrap-around type adapted to receive a plurality of containers of a predetermined size, said blank having terminal panels with locking means for forming the blank into a continuous envelope, said carton having adjacent panel portons joined

along a fold line and adapted to form a corner for snugly engaging a container, an expansion formation disposed along said fold line and being generally H-shaped in outline, said expansion formation including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions.

13. In a package comprising a plurality of containers of the type having an upper shoulder and an upstanding neck and a package forming carton wrapped around said containers with panels of said carton joined along a fold line defining a corner snugly engaging said container shoulders, an expansion formation disposed along said fold line and being generally H-shaped in outline, said expansion formation including a pair of upright cuts and a cross bar, said cross bar extending along said fold line and being in the form of closely spaced notches separated by rupturable bridging portions.

14. The carton of claim 5 wherein each of said expansion means extend across a respective one of said fold lines and is disposed partially in said one container end opposing panel and partially in the respective adjacent side panel.

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LOUIS G. MANCENE, *Primary Examiner.*

THERON E. CONDON, *Examiner.*

W. T. DIXSON, *Assistant Examiner.*