United States Patent

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[72] Inventors **Fred B. Shaw**
Hinsdale;
Florren E. Long, La Grange, both of Ill.

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

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[54] **CARTON FOR TETRAHEDRAL PACKAGES**
2 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** ..... **206/65 T,** 229/14 C, 229/44 R
[51] **Int. Cl.** **B65d 71/00**
[50] **Field of Search** ..... 206/46 FR, 65 T; 229/43, 44 R, 14 C

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Primary Examiner—Joseph R. Leclair
Assistant Examiner—Steven E. Lipman
Attorney—Diller, Brown, Ramik & Holt

ABSTRACT: This disclosure relates to cartons for packaging a plurality of individual tetrahedral articles and includes a carton body defined by a polygonally shaped bottom wall, opposite pairs of sidewalls, and opposite pairs of end walls, a closure panel is joined by a fold line to each sidewall with the closure panels being in a common plane parallel to the bottom wall in the closed position thereof, a medial panel is joined to each closure panel by a fold line with the medial panels being in side-by-side contiguous relationship generally parallel to a plane normal to the bottom wall, a terminal flap being joined to each medial panel along a fold line and being folded therealong into an outward and upward direction, and each terminal flap and its associated medial panel setting off an acute angle therebetween whereby the terminal flaps engage sides of the tetrahedral articles between the opposite transversely disposed seams thereof.

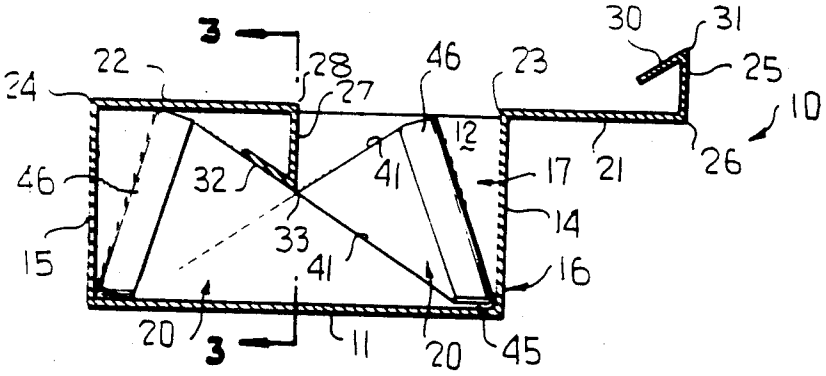
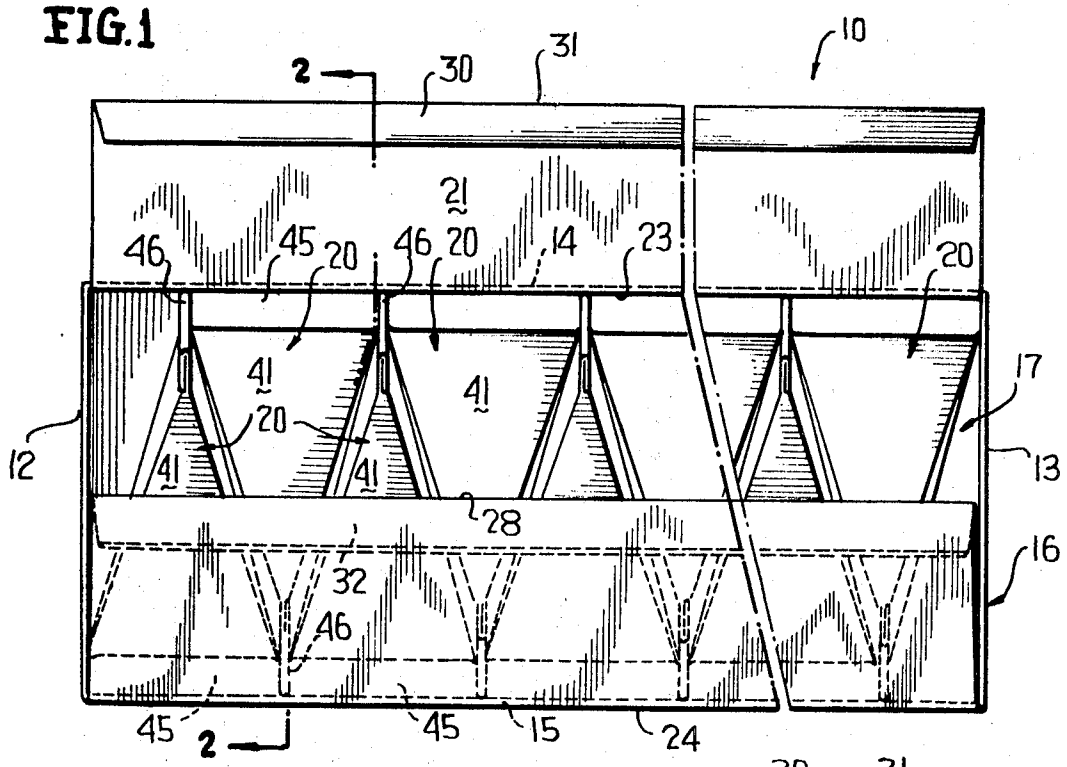


FIG.1



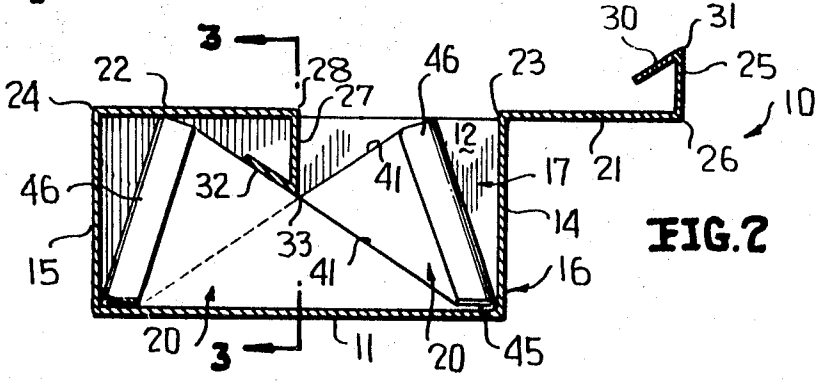


FIG.2

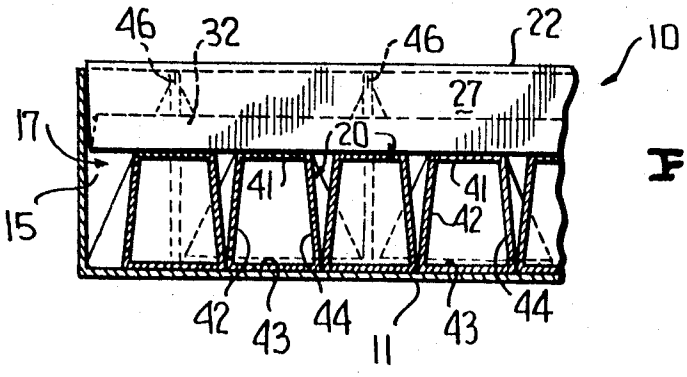


FIG.3

INVENTORS
FRED B. SHAW
& FLORREN E. LONG

Dillon, Brown, Ramik & Wall
ATTORNEYS

CARTON FOR TETRAHEDRAL PACKAGES

This application is a divisional of my copending commonly assigned application Ser. No. 804,633, filed Mar. 5, 1969, entitled Carton for Tetrahedral Packages.

This invention relates to packaging and, more particularly, to packaging a plurality of individual tetrahedral articles in a carton in such a manner as to protect the articles from damage during shipment, storage, and/or any type of rough handling which may be encountered from production to consumption.

In the art of packaging, it has become advantageous to supply certain powdered and liquid products such as juices, beverages, etc., as well as other food and nonfood products, to the ultimate consumer in an individual disposable tetrahedral-shaped serving package. The package holds an average serving of the product, and can be readily disposed of when emptied of its contents.

The tetrahedral package can be conveniently made by a conventional form-and-fill machine which is adapted to form the package from a length of tubing, fill the package with the product, and seal the ends of the tubing to complete the formation of the package. Each tetrahedral package has a transverse seal at one end in a first plane and a transverse seal at its other end in a second plane disposed at a 90° angle to the plane of the first transverse seal such that the package has four triangular sides, two of which have the first transverse seal as their base and the other two of which have the second transverse seal as their base.

The main advantage that tetrahedral packages have over conventional flat pouches is that they offer economy in that they employ fewer square inches of laminated sheet material tubing to contain a given volume of product. Moreover, placement of the end seals at right angles to each other gives the tetrahedral package a rigidity not attainable in the conventional pouches thereby providing the possibility of using an opened package as a dispenser that could be set down on a horizontal surface, when still partially filled, without the risk of leakage.

Although tetrahedral packages present many advantages over the conventional flat pouches, they have not acquired widespread acceptance by packagers because, due to their unique construction, they are readily susceptible to damage, particularly in transit, by similar packages with which they come into contact.

Conventional pouches are relatively limp items even when filled, and tend to conform in shape to the space available to them even to the extent of folding upon themselves. Tetrahedral packages, on the other hand, are relatively rigid even when formed from lightweight laminates and become substantially rigid when formed from laminates containing paper board. Accordingly, tetrahedral packages not only fail to change shape to conform to available space but they combine four relatively nonyielding flat surfaces which are accordingly easily penetrated by a pointed object. Furthermore, both ends of such packages are relatively rigid and are tapered to narrow, bladelike edges. Since each bladelike edge terminates in a sharp point at each side, each tetrahedral package has four pointed corners as well as four flat surfaces that are readily susceptible to perforation. Naturally, when a number of tetrahedral packages featuring these incompatible characteristics are placed in a carton, bag or shipping container of any type so that movement of the unit tetrahedral packages relative to one another is possible, the development of a high percentage of leakers during shipment has been experienced due to the sharp points on the tetrahedral package ends striking a flat surface of another tetrahedral package in such a manner as to either cause a perforation of the flat surface or a bending and fracturing of the normally rigid point.

Prior approaches to the solution of this problem have usually taken the approach of attempting to package a number of tetrahedral articles into an intermediate container or shipping carton, one by one so as to fit them tightly together in a space-filling mass and then hold them in such a position by appropriate wadding, a tight-fitting cover or the like. This technique will prevent relative motion between the individual

tetrahedral articles as long as the intermediate container or carton is not damaged or sprung, and/or as long as one or more of the unit packages is not withdrawn from the carton. However, any change in the tight-packaging situation, either because the shipping carton is damaged or because an individual tetrahedral article has been removed, will result in relative movement between the remaining tetrahedral articles with consequent damage and leakage. Moreover, to carefully package articles one by one requires a time-consuming hand operation that few packagers are willing to accept.

Furthermore, even though tetrahedral articles may have been carefully hand-packed to assure a tight space relationship so that they arrive in the retail outlet in satisfactory condition, they are still susceptible to damage due to subsequent handling after the shipping carton is opened and the unit tetrahedral packages are thus exposed to inspection and display. Damaging impact by the sharp points of the packages against the taut flat surfaces must be expected when a carton full of the tetrahedral packages is emptied onto a display area, or when shoppers tumble the units about in making a selection or in returning a rejected selection.

It is, therefore, a primary object of this invention to provide a carton for packaging a plurality of individual tetrahedral packages or similar articles which will protect the tetrahedral packages against damage during shipment, storage and/or other type handling.

More particularly, it is an object of this invention to provide a carton for packaging a plurality of individual tetrahedral articles wherein the carton is provided with closure panels each having a terminal end flap which in conjunction with a bottom wall of the carton sandwiches the tetrahedral packages therebetween and restrains the same from relative movement.

Another object of this invention is to provide a carton particularly adapted to snugly receive a plurality of tetrahedral packages disposed in alternate abutting relationship therein of the type aforesaid wherein the terminal flaps and adjacent medial panels of the closure panels each define an acute angle therebetween corresponding to the angle of an uppermost sidewall of each tetrahedral package in the carton.

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 claimed subject matter, and the several views illustrated in the accompanying drawing.

IN THE DRAWING

FIG. 1 is a fragmentary top plan view of a carton constructed in accordance with this invention, and illustrates a plurality of tetrahedral articles or packages disposed therein in alternate abutting relationship with one of a pair of closure panels illustrated in its closed position.

FIG. 2 is a sectional view taken generally along line 2—2 of FIG. 1, and illustrates an inwardly and upwardly folded terminal end of one of the closure panels engaging a side of a tetrahedral article to hold it securely within the carton in conjunction with the bottom wall thereof.

FIG. 3 is a fragmentary vertical sectional view taken generally along line 3—3 of FIG. 2, and illustrates the bottoms of the alternately disposed tetrahedral articles abutting one another to effect a tight closely packed package, and more clearly illustrates the manner in which each package is sandwiched between the carton bottom wall and the closure panel terminal flap.

Referring to the drawing in detail, a novel carton constructed in accordance with this invention is generally designated by the reference numeral **10** and includes a generally polygonal or rectangular bottom wall **11**, a pair of opposite upstanding generally parallel end walls **12**, **13** joined to the bottom wall **11** along lowermost edges (unnumbered), and a pair of upstanding generally parallel sidewalls **14**, **15**, likewise joined to edges (unnumbered) of the bottom wall **11**. The walls **11** through **15** define a carton body, generally

designated by the reference numeral **16**, which includes an interior chamber **17** housing a plurality of identical tetrahedral articles or packages **20** which will be described more fully hereinafter.

A pair of closure panels **21, 22** are joined by respective fold lines **23, 24** to the respective sidewalls **14, 15**. The closure panels or walls **21, 22** are adapted to fold about their respective fold lines from the open positions thereof, indicated by the closure wall **21** in FIG. **2**, to the closed position indicated by the closure wall **22** of FIG. **2**.

A medial panel **25** is joined to the closure panel **21** along a fold line **26** while a like medial panel **27** is joined by a fold line **28** to the closure panel **22**. In the closed position of both closure panels **21, 22** the medial panels **25, 27** are in contiguous side-by-side relationship in planes generally parallel to a plane through the longitudinal axis of the carton body **16** and normal to the bottom wall **11**.

A terminal flap **30** is joined to the medial panel **25** along a fold line **31** while a like terminal flap **32** is joined to the medial panel **27** along a fold line **33**. Likewise, in the closed position of the terminal flaps **30, 32** the same are folded about the respective fold lines **31, 33** in an outward and upward direction to define an acute angle between the respective walls **25, 30** and **27, 32**, as is readily apparent from FIG. **2**.

Reference is now made to the second tetrahedral package from the left side of the carton **10** of FIG. **1** which is illustrated in each of FIGS. **1** through **3** and includes four sidewalls or panels **41** through **44**, a transverse generally horizontally disposed end seam **45** and an upstanding opposite transversely disposed end seam **46**. The remaining identically numbered packages **20** include, of course, like corresponding components **41** through **46**.

The packages **20** are positioned in the chamber **17** of the carton body **16** in an alternate fashion, as is most readily apparent from FIG. **1**. Thus, as viewed in FIG. **1**, the first, third, fifth, etc., package is positioned with its seam **45** disposed in a generally horizontal plane adjacent the bottom wall **11** at the sidewall **15** while the second, fourth, etc., package **20** from the left in the same figure is positioned with its corresponding seam **45** adjacent and generally horizontal to the bottom wall **11** at the sidewall **14**. The packages **20** thereby define generally two longitudinal rows of alternately arranged articles with the sides **42, 44** adjacent to each other and in the absence of any contact whatever between the transverse seams **45, 46** of the packages with the sides thereof.

Upon the closing of the closure panel **21** to its fully closed position which is readily apparent from FIG. **2**, the panels **21, 22** are disposed in a generally common plane parallel to the bottom wall **11**, while the medial panels **25, 27** are in contiguous side-by-side relationship to a plane generally parallel to the longitudinal axis of the carton body **16** and normal to the bottom wall **11**. Moreover, the terminal flaps **30, 32** are directed upwardly and outwardly and thus sandwich each tetrahedral package **20** between at least one of the terminal panels **30, 32** and the bottom wall **11**. Obviously, irrespective of the removal of any one of the packages **20**, this same sandwich relationship remains unchanged and the remaining packages likewise remain constrained or sandwiched between the terminal panels **30, 32** and the bottom wall **11**. Thus, shifting between the packages **20** during storage, shipment, or any other type of rough handling is virtually precluded and the latter-noted rupturing and similar damage is precluded by the carton **10** of this invention.

While preferred forms and arrangements of parts have been shown in illustrating the invention, it is to be clearly understood that various changes in details and arrangement of parts may be made without departing from the spirit and scope of this disclosure.

We claim:

1. A carton for packaging a plurality of tetrahedral articles having opposite transversely disposed end seams comprising a carton body defined by a generally polygonally shaped bottom wall having opposite pairs of side and end edges, an upstanding end wall joined to said bottom wall at each of the end edges thereof, an upstanding sidewall joined to said bottom wall at each of the side edges thereof, a closure panel joined to each sidewall along a fold line defining the uppermost edge of each sidewall, said closure panels lying in a common plane in spaced parallel relationship to said bottom wall, a medial panel joined to each closure panel by a fold line with said medial panels being in side-by-side contiguous relationship and generally parallel to a plane normal to said bottom wall, a terminal flap joined to each medial panel along a fold line and being folded therealong in an outward and upward direction, and each terminal flap and its associated medial panel setting off an acute angle therebetween whereby said terminal flaps are adapted to engage sides of tetrahedral articles between the opposite transversely disposed seams thereof thereby restraining the articles between the terminal flaps and the bottom wall.

2. The carton as defined in claim **1** including a plurality of tetrahedral articles packaged within said carton, said plurality of tetrahedral articles being arranged in two rows with one seam of each article being adjacent one of said sidewalls and the opposite seam of each respective article being adjacent the opposite sidewall and in upstanding relationship thereto, and each terminal flap being in contact with a sidewall of alternate tetrahedral article between the seams thereof.

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