

May 26, 1964

J. VOORHIES

3,134,486

CARTONS FOR ELECTRICAL BULBS AND THE LIKE

Filed Aug. 13, 1962

2 Sheets-Sheet 1

FIG. 1

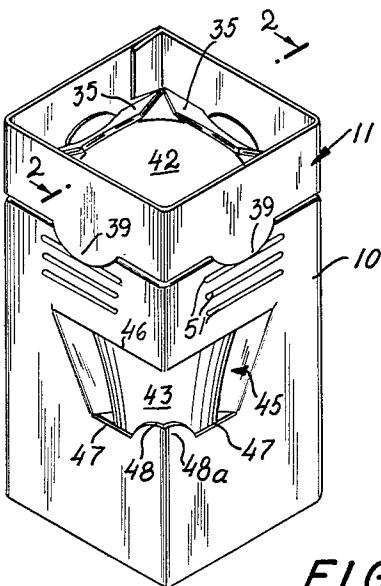


FIG. 2

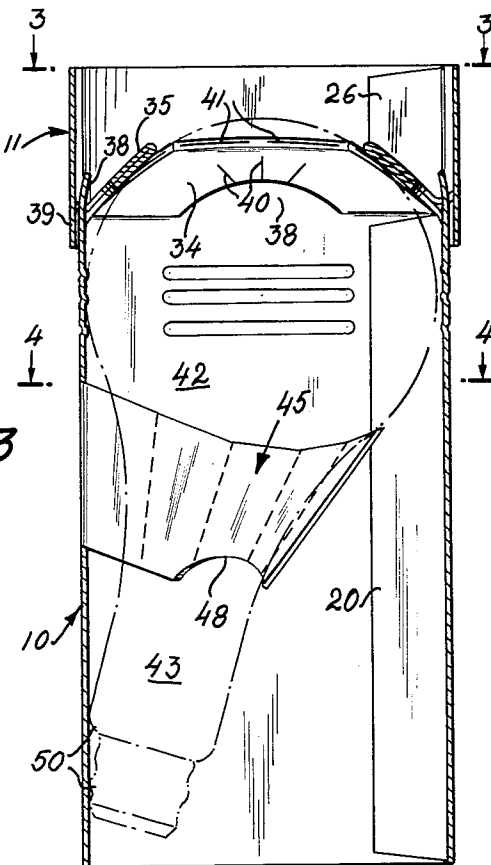


FIG. 3

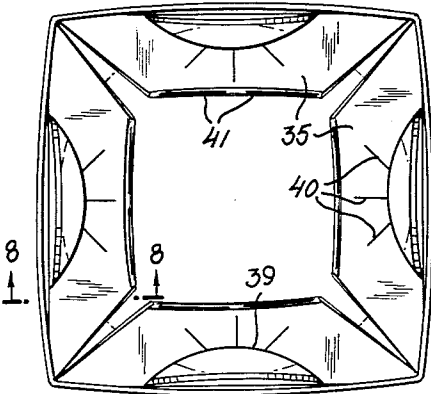
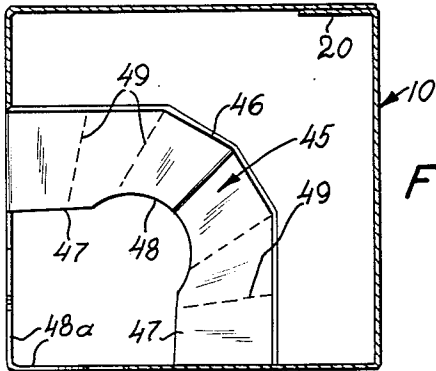


FIG. 4



May 26, 1964

J. VOORHIES

3,134,486

CARTONS FOR ELECTRICAL BULBS AND THE LIKE

Filed Aug. 13, 1962

2 Sheets-Sheet 2

FIG. 5

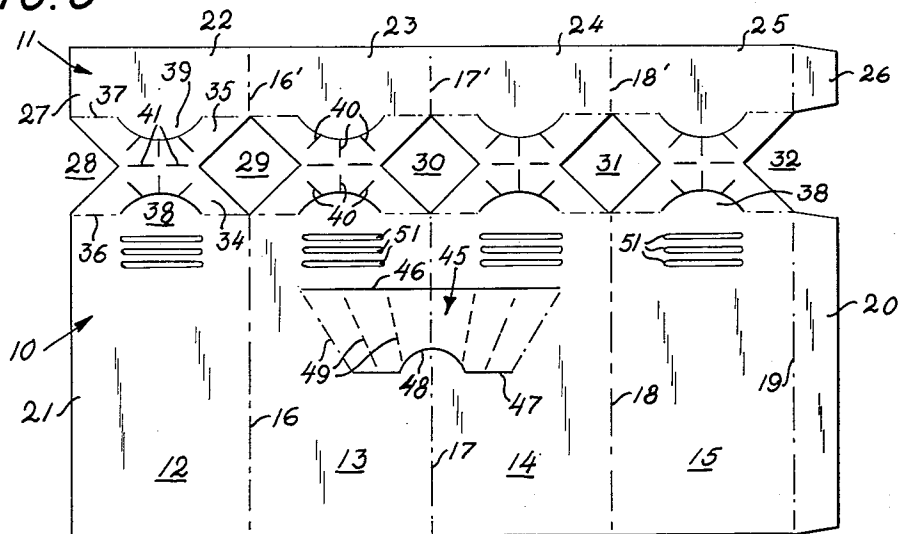


FIG. 6

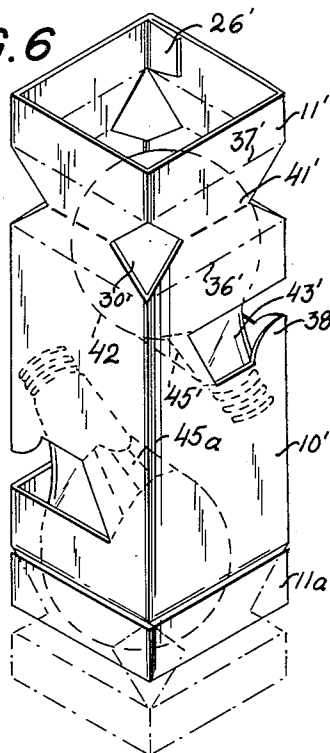


FIG. 7

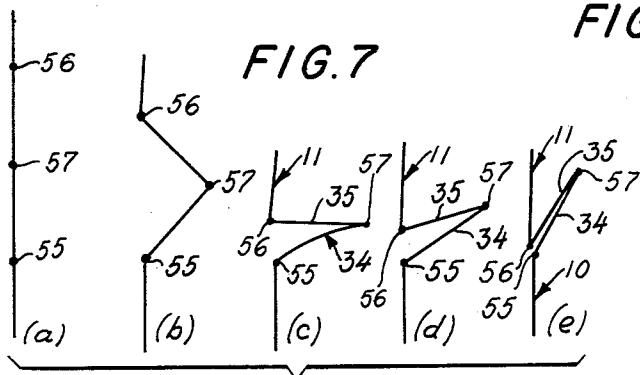


FIG. 8

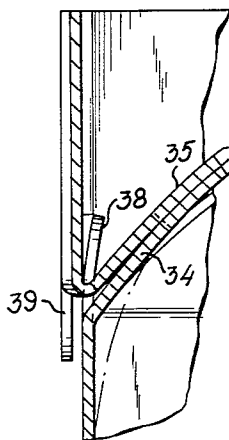
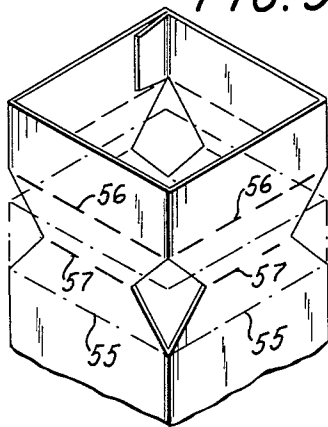


FIG. 9



1

2

3,134,486 CARTONS FOR ELECTRICAL BULBS AND THE LIKE

John Voorhies, Brookpark, Ohio, assignor to St. Regis Paper Company, New York, N.Y., a corporation of New York

Filed Aug. 13, 1962, Ser. No. 216,584

2 Claims. (Cl. 206—65)

This invention relates to cartons formed of paperboard or other sheet material and particularly adapted, among other possible uses, for containing electrical bulbs such as lamps. The invention further involves a novel package comprised of such cartons as containing such articles.

The invention provides a simple and inexpensive construction which may be formed preferably of a single piece of paperboard or the like and so shaped as to provide a tubular main body or box portion and an attached end portion which, before an object is inserted in the carton, may assume an outwardly-extending position, and then after the object has been inserted, such end portion may be pushed toward the main body portion and abruptly assume a releasable but substantially locked relation therewith, while at the same time connecting parts in the form of gusset-like folds will be thrust inwardly to positions securely retaining the article within the carton.

To accomplish this result, the main body portion of the carton is connected to the end portion by wall portions formed with creases so as to fold inwardly and gusset-like, each gusset-like portion being separated from the others by a cut-out aperture. That is, in case the carton is for example of square or rectangular cross-section, these apertures are formed at the four corners of the connecting portion. This will leave four of the gusset-like inward folds, one for each of the four walls of the carton, and the opposed folds of each of these act in effect like the links of a toggle joint, and with which, when the end portion of the carton is in extended position, the "toggle links" (as hereinafter so called) will be spread out longitudinally of the walls of the carton, but when the carton end portion is pushed to closed position, these links will be folded inwardly and finally past an "over-center" condition such that the end portion of the carton will snap firmly against the main body portion.

In accordance with the invention, various expedients (hereinafter explained) separately or together may be used to insure that when the "toggle links" collapse together after passing the "over-center" relation, they will be directed within the interior of the carton end portion and toward the end of the carton, thereby affording the locking relation of the end portion in place, instead of being directed into the space within the main body portion of the carton at angles toward the mid-portion of the carton, in which condition they would engage an object within the carton in such manner that pressure of the object would tend to force the carton end portion out to extended position, thereby releasing the contained object.

In case the object packed in the carton is, for example, of the general shape of a lamp bulb having a bulb portion and a neck or socket-engaging portion, then the latter portion, in accordance with the invention, may be firmly secured in place by forming the main body of the carton with a preferably integral re-entrant portion adapted to embrace the neck of the article and to retain same against the interior walls of the carton and in such manner that the bulb portion is securely retained in a position to engage the gusset-like folds, thereby holding same in the positions as above explained, for effectively locking the carton end portion against the body portion.

Preferably as with the forms of the invention illustrated, the carton is made of a shape to have a square or rectangular cross-section, although the invention is adapted

for use in forming cartons of other tubular shapes, such as triangular, polygonal or circular in cross-section. While such cartons are preferably formed of somewhat rigid paperboard, of types adapted to be provided with crease lines which will be in the nature of quite flexible hinges, yet if preferred, in some cases suitable forms of plastic or other sheet material may be used, and also corrugated board material, preferably of the single-faced type may be used, and preferably with the corrugating medium facing inwardly, resiliently to engage the retained objects and with the corrugations running in the directions of the creases which form the gusset folds above referred to.

In the event that it is desired that the carton contain two objects such as lamp bulbs or the like, then end portions such as described may be provided at both ends of the main body portion and arrangements may be provided at the mid-portion of the carton for retaining side-by-side the neck portions of the two objects.

Various further and more specific objects, features and advantages of the invention will appear from the description given below, taken in connection with the accompanying drawings, illustrating by way of example preferred forms of the invention.

In the drawings:

FIG. 1 is a perspective view of a typical example of a carton embodying the invention and as containing an electric lamp bulb held in place therein;

FIG. 2 is an enlarged sectional view taken substantially along line 2—2 of FIG. 1;

FIGS. 3 and 4 respectively are horizontal sectional views taken substantially along the lines 3—3 and 4—4 of FIG. 2;

FIG. 5 is a developed view of a piece of sheet material before being folded into shape to form the carton of FIG. 1;

FIG. 6 is a perspective view of another embodiment of the invention as adapted particularly for containing two objects with stems, such as electric lamp bulbs;

FIG. 7 comprises a group of diagrams illustrating the operation of the gusset-like fold "toggle joint" arrangement;

FIG. 8 is an enlarged sectional view of a portion of the carton of FIG. 1, the section being taken substantially along line 8—8 of FIG. 3; and

FIG. 9 is a perspective view illustrating a portion of a further embodiment of the invention.

Referring now to the drawings in further detail, in FIG. 1 the main body portion of the carton is indicated at 10 and the end portion thereof is shown at 11 in closed position, that is in a position where it is releasably locked against the body portion. The carton of the type shown in FIG. 1, may be formed of a single piece of the sheet material used for the purpose, and which is cut to the shape indicated in FIG. 5, wherein the dot-and-dash lines indicate fold or crease lines, and the full lines indicate either edges of the paperboard, or slits therethrough.

From FIG. 5 it will be noted that the main body portion 10 may be comprised of four wall panels as at 12—15 inclusive, connected along corner crease lines as at 16—18 inclusive, the panel 15 also being connected at a crease line 19 to an extending tab or strip portion 20 adapted when the blank is folded to box-like shape, to be adhered to the previously free edge portion 21 of panel 12.

Similarly, the end portion 11 of the carton may comprise four panels as at 22—25 inclusive, interconnected at crease lines 16'—18' inclusive, and the portion 25 having at its sides a tab portion 26 adapted to be adhered to the edge 27 of the portion 22 when the carton is erected.

The parts which connect the main body and end portions of the carton are defined partially by apertures 28—32 inclusive and, as here shown, the apertures 29—31

are square and the apertures 28 and 32 are adapted conjointly to form a like aperture in the finished carton.

The connections between the main body panels and panels of the end portion comprise a pair of gusset-like folds as at 34 and 35, one pair for each of the side wall areas of the carton. Gusset-like fold 34 is connected to the main body portion by foldable crease lines 36. Similarly gusset-like fold 35 is connected to the panel 22 by foldable crease lines 37, in each of these cases respectively these crease lines, as shown, being interrupted by tabs as at 38, 39, which tabs, as shown, may be outlined by arcuately-shaped slits. Such arcuately-shaped slits may be accompanied by slits as at 40 radially directed outwardly of the arcs, these being for the purpose of enabling the gusset-like folds when in use to more firmly conform to the surface of an object, such as a bulb in the carton.

Each pair of gusset-like folds 34, 35 may be interconnected preferably along a fold line established as by a pair of slits such as indicated at 41, these slits providing a freely operable hinge connection between the two folds.

Where an object such as a bulb 42 having a stem 43 is to be contained in the carton, such stem may be embraced by providing a formation such as indicated generally at 45 in FIG. 5. This is formed by slitting the panels 13 and 14 with upper and lower slits as at 46 and 47, the latter being interrupted by an arcuate tab-forming slit 48. Several interrupted short slit lines as at 49 may be provided along lines at angles to the vertical as shown, and extending between the slits 46 and 47.

The formation 45 may be thrust inwardly of one corner of the set-up carton, as will be apparent from FIGS. 1, 2 and 4, and so that it will form in effect a band embracing the lamp bulb at a region at the juncture of the stem and bulb portion. It will be noted that the slits 46 and 47 are so placed that this band will conform to the adjacent portions of the lamp and the angular positions of the lines of interrupted slits at 49 will enable the band to be bent along these lines so as more closely to embrace the lamp, while the lower end of the stem, as shown at 50 in FIG. 2, will engage within a corner of the carton, thereby holding the lamp in a fixed position against sliding down further after it is engaged by the band formation 45. Thus the upper rounded portion of the bulb will assume a fixed position adapted to be engaged by the gusset-like fold portions 34, 35 when same are in their "over-center" and "locked" positions, as further shown in FIGS. 1 and 2.

It will be noted further that the arcuate tab-forming slit 48, as shown in FIGS. 2 and 4, provides an arcuately shaped cutout portion on the lower edge of the band formation 45, enabling the latter better to conform to the shape of the lamp at this region. At the same time, this arcuate slit will leave an upstanding tab portion 48a, as shown in FIGS. 1 and 4 for further protecting the lamp against being injured at the region of the opening left by the band portion 45.

It will be understood that the blanks, as shown in FIG. 5, may be cut and formed from the desired sheet material by the use of apparatus of the general types heretofore used in the forming of blanks for folding cartons and equipped with dies of suitable shapes to perform the necessary slitting and creasing operations.

The blanks as shown in FIG. 5, are each folded to box-like form, and the tabs 20 and 26 are adhered to the opposite edge portions of the blank at 21 and 27 respectively in a manner and by the use of equipment similar to that commonly available for the manufacture of paper-board boxes, whereupon the carton will be ready for use in the manner indicated in FIG. 1, except that the end portion 11 will be in extended position and the band portion 45 will be in a position ready to be thrust inwardly to the position shown in FIG. 1. Thereupon, the article which is to be packed in the carton, such as a lamp, may be inserted to the position shown in FIG.

1, with the neck portions firmly seated against the band portion 45, whereupon the top or end portion 11 may be thrust downwardly and same will snap firmly into the position shown in FIGS. 1 and 2, ready for shipment.

It will be noted that tab portions, as at 39, on the lower edges of the portion 11 of the carton, will have now assumed a portion extending down outside the wall surfaces of the body portion 10. At the same time, the corresponding tab portions 38 located on the top edge of the main body of the carton, will have slid in under the tab portions 39 and upwardly after being relatively deflected inwardly somewhat and to the positions shown in FIGS. 2 and 8. While initially each of the pair of tabs as at 38 and 39 will have been located in the same planes, yet when the carton end portion 11 is thrust downwardly, these tabs will not tend to engage and obstruct each other, but tabs 39 will tend to be deflected outwardly, or the tabs 38 inwardly, enough so that they will not interfere. Such relative deflection may in part be due to the fact that, as shown in FIGS. 1 and 5, a number of stiffening ribs or corrugations, as at 51, may be embossed on the walls of the carton just beneath each of the tabs 38, so that these portions of the carton walls will tend to remain flat, while the action of the gusset-like folds 34, 35, particularly as engaged by the lamp or other object in the carton, will tend to be such that the wall surfaces of the carton end portion 11 will bulge outwardly somewhat in coming down into position, the bulging being sufficient so that the ends of the pairs of tabs 38, 39 will slip past each other with the tabs 39 sliding down onto the exterior surface of the body of the carton, thereby firmly holding the carton end portion 11 against transverse displacement during shipment.

As hereinabove stated, various expedients, separately or together, may be used to insure that the gusset-like folds referred to as "toggle links" will collapse together after passing the "over-center" relation, so that they will be directed inwardly and upwardly in the carton end 11, as viewed in FIGS. 1, 2 and 3. This result, which causes releasable locking of the carton end in the down position, and firmly seated against the body portion 10, will necessarily occur if an object such as a lamp bulb, as shown, is firmly positioned and held in the carton so that the "toggle links" will be engaged and be thrust upwardly by the bulb surface, as best shown in FIG. 2. However, it is desirable that the same general result occur independently of the object contained in the carton, so that if one or more of the contained objects has been removed, the carton end will nevertheless snap into locked or closed position and prevent other objects from falling out. Also in some cases it may be desired to use the cartons for objects which would not operatively engage the "toggle links," as above explained. Thus for such situations, the gusset fold lines may be formed as will now be explained, particularly in connection with FIGS. 7 and 9. In FIG. 9 the fold lines as at 55 at the lower edges of the lower gusset folds, while being formed as creases, are left with sufficient spring-like resilience to resist inward folding along these lines, whereas the corresponding fold lines 56 at the upper edges of the upper gusset folds are formed as a series of slits, or else more deeply creased, or are otherwise so formed as to be at least somewhat less resistant to folding and less spring-like than the fold lines 55. In any case, the central gusset fold line 57 may be made relatively non-resistant to folding, and preferably less springy than the fold line 55. Thus as shown, line 57 may be formed by a plurality of slits. Referring now to the schematic diagrams of FIG. 7, in diagram (a) the "toggle links" 55-57 and 57-56 are shown end to end in the positions which they will assume when the top or end portion of the carton is extended. Then, as such portion is pushed down, as in diagram (b) of FIG. 7, some bending will occur at each of the three fold lines, but as indicated in diagram (c), gusset fold 34 will begin to be curved or bent at its inner portions somewhat downward-

ly as a leaf spring, while folding thereof about the line 55 will be resisted by the springiness of the material along that line. And when gusset fold 35, as shown in this diagram, becomes brought down to a horizontal position, the adjacent wall portion on the carton end portion 11, will be sprung outwardly somewhat, just as the fold 35 is ready to snap upwardly past the horizontal or "over-center" position. Thus, as shown in diagram (d), the springiness of the joint at the fold line 55, will insure that the folded gusset will snap upwardly, rather than downwardly. Finally, as the carton end portion 11 is brought down against the body portion 10, the gusset folds 34, 35 will come substantially together and in such positions the carton end portion will be effectively but releasably locked in its down position, firmly seated against the carton body whether or not there is any object contained in the carton in contact with the gusset folds. Thus with the end portion firmly seated against the carton body, all of the four walls of the carton become closed at the region of the gusset folds and a firm and complete package is provided for the lamp bulb or other contained object without the necessity of any outer carton or other enclosing means. It will be noted that the central gusset fold or weakened line in each case, as at 41 in FIG. 5, at 41' in FIG. 6, and at 57 in FIGS. 7 and 9, is located midway between the hinge lines such as at 36 and 37 where the gusset structure joins respectively the body and the end portion of the carton. This midway position of the central weakened line makes it possible for the gusseted folds completely to collapse so that the end portion can become firmly seated upon the end edges of the body of the carton.

If desired, instead of using a hinge line at 56 which is relatively weak and less springy than that at 55, and if it is desired to have these two hinge lines of substantially the same nature, the results shown in FIGS. 7 (c), (d) and (e) may also be accomplished by relying on the relative stiffness of the upper edges of the body portion 10, due to its dimensions, or due to the embossing or ribbed lines 51, so that as the "toggle links" operate, these areas will not tend to bulge out. And at the same time, the lower edges of the extension portion 11 of the carton, if made of somewhat yieldable material, will tend to bulge outwardly due to the smaller dimensions of the end portion 11, while the "toggle links" are in the process of operating, and in a manner similar to that indicated in the diagram FIG. 7 (d), thereby permitting the "toggle links" to snap upwardly as desired, instead of downwardly. In this case, both of the hinge lines at 56 and 57 may be fairly spring-like.

It may be mentioned that, as shown in FIG. 5, the apertures as at 29-31, are of a square shape; that is, the upper and lower angles of these apertures are 90° angles. This will insure, as will be apparent from FIG. 3, that as the gusset folds turn inwardly, those on each of the walls of the container will have clearance at their ends with respect to the others. However, if desired, the upper and lower angles of these apertures may be made greater than 90° to afford ample clearance such as may be required sometimes if the carton is of a tubular form, other than one having a square or rectangular cross-section.

The construction of the alternative embodiment of the invention, as shown in FIG. 6, will be apparent from the constructions above explained in connection with FIGS.

1 and 9, corresponding portions being identified by the same numerals accompanied by prime marks. The significant difference with the embodiment of FIG. 6, however, resides in the provision of end portions as at 11' and 11a at each end respectively of the body portion 10', so as to provide like spaces for two lamp bulbs, for example, with their neck portions side-by-side but oppositely directed, as indicated in FIG. 6, there being band formations as at 45' and 45a respectively, cut from diagonally opposite corners of the body portion, for receiving and gripping the necks of the lamps respectively.

Although certain particular embodiments of the invention are herein disclosed for purposes of explanation, further modifications thereof, after study of this specification, will be apparent to those skilled in the art to which the invention pertains. Reference should accordingly be had to the appended claims in determining the scope of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. In combination: a carton formed of semi-rigid sheet material and having a tubular body portion and an end extension portion in seated relation to an end of said body portion and integrally connected thereto by a plurality of gusset-like folds which are folded inwardly and collapsed while directed in biased positions at angles toward the end of the carton; and an article contained in said carton and bearing against said collapsed folds and holding same in such biased positions, an integral band-like part of a wall of said body portion protruding inwardly and positively retaining the article in such position bearing against the folds, said end extension portion, upon being forcefully retracted from its seating engagement with the body portion, causing said gusset-like folds to be retracted outwardly thereby to release and permit removal of said article, said folds being defined by hinge-like lines where same respectively join the body and end portions, and by a weakened fold line mid-way between said hinge lines, such lines of juncture with the body portion at least being sufficiently spring-like, whereby when the end portion is thrust toward the body portion, the folds will assume said collapsed, biased positions, causing the carton end portion to snap into a firmly-retained, seated relation to the body portion, the carton walls thus becoming closed at the region of said gusset folds.

2. A combination in accordance with the foregoing claim 1 and in which the body portion is accompanied by one of said end extension portions at each end of the body portion and in seated relation respectively to the ends of said body portion and two of said articles being contained in the carton with stem portions in side-by-side relation and with bulb portions thereon respectively engaging the gusset-like folds in the end extension portions.

References Cited in the file of this patent

UNITED STATES PATENTS

2,474,523	Guyer	June 28, 1949
2,843,308	Paige	July 15, 1958

FOREIGN PATENTS

147,385	Sweden	Oct. 19, 1954
283,297	Great Britain	Jan. 12, 1928
338,271	Great Britain	Nov. 20, 1930
365,078	Great Britain	Jan. 14, 1932