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L. S. WYSOCKI

3,467,298

HEXAGONAL ONE-PIECE CARTON

Filed Sept. 27, 1967

2 Sheets-Sheet 1

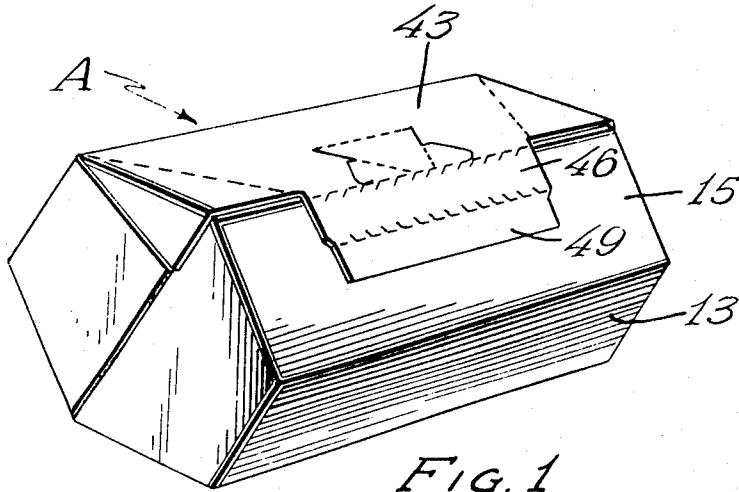


FIG. 1

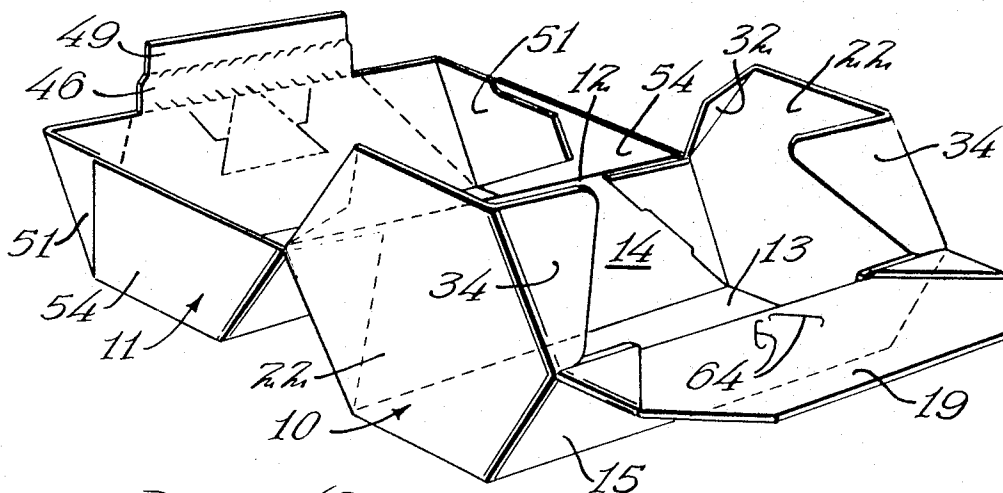


FIG. 2

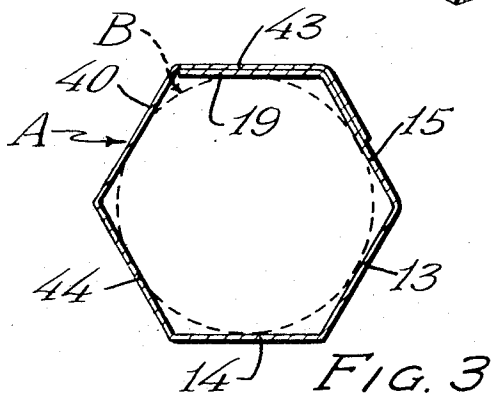


FIG. 3

INVENTOR
LAWRENCE S. WYSOCKI
BY *Robert M. Denning*
ATTORNEY

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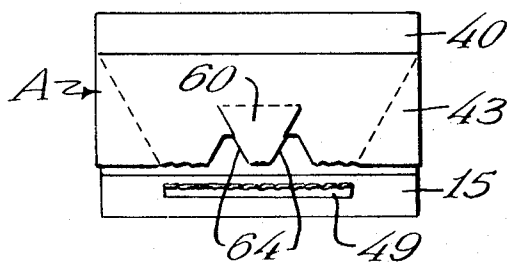
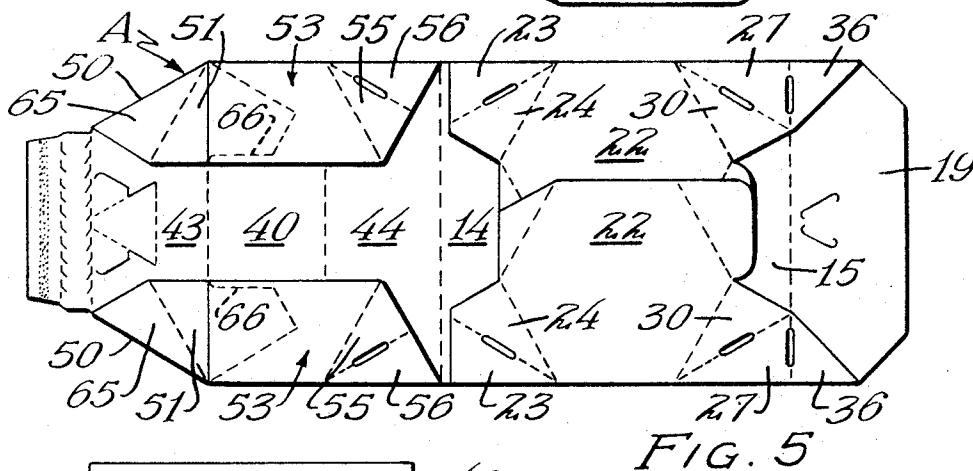
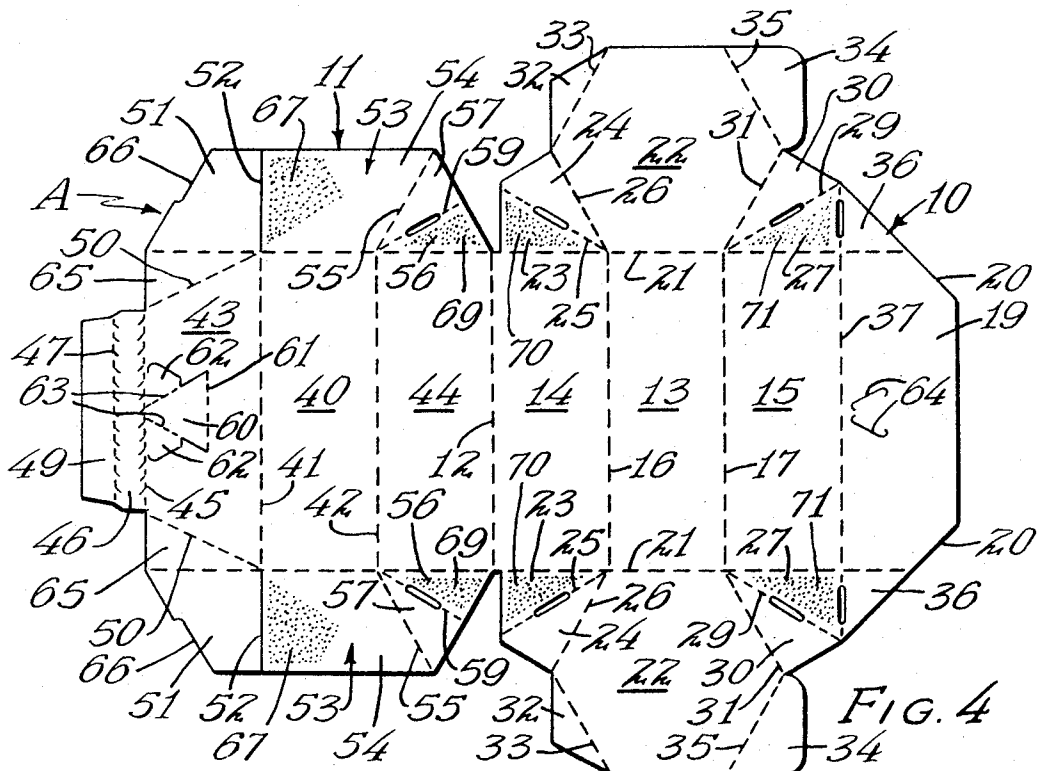


FIG. 6

INVENTOR

LAWRENCE S. WYSOCKI

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HEXAGONAL ONE-PIECE CARTON

Lawrence S. Wysocki, Chicago, Ill., assignor to Hoerner-Waldorf Corporation, St. Paul, Minn., a corporation of Delaware

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10 Claims

ABSTRACT OF THE DISCLOSURE

This invention comprises a hexagonal one-piece carton designed to enclose a cylindrical or hexagonal product such as an ice cream cake roll or the like. The carton includes two semihexagonal tray sections foldably connected. The arrangement is such that as the ends of the two sections are folded outwardly into parallel relation, the sections automatically fold into semihexagonal shape for filling. The sections are then folded together, and a glue flap on one section is adhered to a panel of the other section. A tear strip permits separation of the glue flap for opening the carton. Locking means are provided for reclosing.

This invention relates to an improvement in hexagonal one-piece cartons and deals particularly with a carton designed to contain a generally cylindrical or hexagonal product such as an ice cream cake roll and the like.

Products such as ice cream cake rolls and the like which are of generally cylindrical form are difficult to package in conventional rectangular cartons. Due to the cylindrical shape of the product, they require a rectangular carton considerably larger than the product itself. Furthermore, a rectangular carton does not provide a particularly good support for the product in the event the product softens. Obviously, a carton of hexagonal cross section provides much better support for the product and leaves considerably less waste space between the product and the walls of the carton. Due to the fact that products of this type are specialty items, they are often times not sold in sufficient quantity to require automatic machinery to seal. It is an object of the present invention to provide a hexagonal carton which may be glued and stored in flat form, and which may be manually erected for filling, and manually closed after filling.

A further feature of the present invention resides in the provision of a carton of the type described which includes locking means for holding the carton reclosed. In many instances only a part of the product is used at one time, and the remaining product must be effectively contained until the rest of the contents are used. I provide a novel and effective lock which may be used to hold the carton reclosed after it has been once opened and after a portion of the carton contents has been removed.

A further feature of the present invention resides in the provision of a carton which may be glued in flat form, and which may be manually erected to provide a pair of side by side tapered tray sections hingedly connected together. When in this condition, the product is inserted in one of the tray sections, and the other tray-like sections may be folded to enclose the contents. In forming the carton from flat position into position to contain the contents, the ends of the carton automatically fold into right angular relation to the hexagonally arranged side walls. The closure may be completed by adhering a glue flap on one of the sections in face contact with the adjoining wall of another section, the carton being thus sealed. Preapplied adhesive may be employed if desired. In preferred form, the glue flap includes a removable tear strip which may be detached to allow the two sections to

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fold apart. A supplemental lock is provided which may be used in the event the carton is to be reclosed.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification, FIGURE 1 is a perspective view of the carton in closed and sealed condition.

FIGURE 2 is a perspective view of the carton in position for receiving the carton contents.

FIGURE 3 is a cross sectional view through the closed carton.

FIGURE 4 is a diagrammatic view of the carton blank from which the carton is formed.

FIGURE 5 is a diagrammatic view showing the blank after the flat blank has been folded.

FIGURE 6 is a plan view of the carton after it has been reclosed.

The hexagonal one-piece carton is indicated in general by the letter A. The carton A was originally designed for containing an ice cream cake roll which is shown in broken lines in FIGURE 3 of the drawings and indicated by the letter B. Obviously, the carton could be used for other products.

The carton A is foldable into two tray-like sections as shown in FIGURE 2 of the drawings prior to filling and closing. These sections may be considered to comprise a bottom section 10 and a top section 11 which are foldably connected along a line of fold 12. Obviously, the terms are merely relative. The bottom tray section 10 includes a rectangular bottom panel 13 and a pair of upwardly and outwardly inclined rectangular side wall panels 14 and 15 connected to the bottom panel 13 along parallel fold lines 16 and 17. A tuck flap 19 which is substantially equal in width to the panels 13, 14, and 15 is provided with generally diagonal corners 20 designed to simplify the manual closing of the carton.

The walls which have been described are defined at their ends by a pair of parallel fold lines 21. Hexagonal end wall panels 22 are foldably connected to the ends of the bottom panel 13 along these fold lines 21. A pair of triangular gusset panels 23 are hingedly connected to the ends of the side wall 14 along extensions of the fold lines 21, and similar triangular gusset flaps 24 are hingedly connected to the gusset flaps 23 along inclined fold lines 25, and are hingedly connected to an edge of each hexagonal end wall 22 along inclined fold lines 26. The triangular gusset flaps 23 and 24 are of equal size and fold into face contact when the carton is erected, as will be later described. The fold lines 21 and 25 are at an angle of 30°, as are the fold lines 25 and 26.

A similar gusset flap construction is provided between the ends of the side wall 15 and the hexagonal end wall 22. Triangular gusset flaps 27 are foldably connected to the ends of the side wall 15 along extensions of the fold line 21. The gusset flaps 27 are hingedly connected along fold lines 29 to similar gusset flaps 30, the gusset flaps 30 being foldably connected to an edge of the hexagonal end wall 22 along inclined fold lines 31. The gusset flaps 27 and 30 are also of similar size and shape and are designed to fold into contiguous relation when the carton is set up, as will be later described. The fold lines 21 and 29 define an angle of substantially 30°, as do the fold lines 29 and 31.

Triangular corner flaps 32 are foldably connected to fourth sides of the hexagonal end panels 22 along fold lines 33. Generally triangular closure flaps 34 are foldably connected along fifth edges of the hexagonal end walls 22 along fold lines 35. The purpose of the flaps 32 and 34 is to overlap adjoining walls of the hexagonal carton when it is closed so as to avoid any area of exposure

of the carton contents. Triangular flaps 36 are also provided connecting the ends of the gusset flaps 27 to the ends of the tuck flap 19. The triangular flaps 36 are defined by extensions of the fold line 37 connecting the tuck flap 19 to the side wall 15, and extensions of the fold lines 21.

The other tray section 11 is somewhat similarly made. Tray section 11 includes a top panel 40 which is hingedly connected along opposite edges by fold lines 41 and 42 to rectangular wall panels 43 and 44 respectively. The wall panel 4 is hingedly connected along the fold line 12 to the wall panel 14. The wall panel 43 is hingedly connected along a weakened line of separation 45 to a removable tear strip 46, the other edge of which is connected along a weakened line of separation 47 to the glue flap 49. Diagonal fold lines 50 extend across the wall panels 43 from the juncture of the fold lines 21 and 41, the fold lines 50 being at an angle of 30° from the fold lines 21. Substantially trapezoidal closure flaps 51 are hingedly connected to opposite ends of the wall panel 43 along a fold line 21. The closure flaps 51 are separated from the remainder of the closure flap structure by cut lines 52 forming the continuation of the fold line 41.

The top panel 40 and adjoining wall panel 44 are hingedly connected along each fold line 81 to a flap structure which is indicated in general by the numeral 53. Each flap structure 53 includes a trapezoidal flap 54 having an outer edge which is parallel to, and is considerably wider than, the width of the top panel 40. An edge of each trapezoidal flap 54 is connected by a fold line 55 to the remainder of the flap structure, the fold lines 55 being at an angle of substantially 30° from a continuation of the fold line 42. A triangular gusset flap 56 is hingedly connected to the wall panel 44 along the fold line 21, and a similar triangular gusset flap 57 is hingedly connected to the flap 56 along a fold line 59, and is connected to the adjoining trapezoidal flap 54 along the fold line 55. The gusset flaps 56 and 57 are of equal size and are designed to fold into contiguous face contact when the carton is erected. The angle defined by the fold lines 21 and 59 is substantially 30° as is the angle between the fold lines 55 and 59.

A triangular locking tongue 60 is hingedly connected to the wall panel 43 along a fold line 61 which is parallel to the fold line 41. Laterally extending generally triangular locking wings 62 are connected to opposite edges of the locking tongue 60 along converging fold lines 63. One side of the locking wings 62 is defined by the weakened line of separation 45 so that when the tear strip 46 is removed, the locking tongue and the locking wings are free to hinge along the fold line 61.

The tuck flap 19 is provided with a pair of angularly inclined converging cut lines 64 which are designed to accommodate the locking wings 62 for reclosing the carton. These cut lines 64 are normally concealed within the package until the carton is first opened.

In the gluing of the flat carton, the closure flaps 51 together with the triangular areas 65 outwardly of the fold line 50 are folded along the fold lines 50 so that the trapezoidal closure flaps 51 overlie a portion of the wall panel 43 and a portion of the top panel 40, the angularly extending edges 66 which are substantially at an angle of 60° from the fold lines 21 extending generally parallel to these fold lines as is indicated in FIGURE 5 of the drawings. Areas of adhesive 67 are applied to the trapezoidal flaps 54, and the flap structures 53 are folded to overlie the closure flaps 51 and are adhered in surface contact thereto. Areas of adhesive 69 are applied to the triangular gusset flaps 56, and these gusset flaps 69 are adhered in face contact to the wall panel 44.

Areas of adhesive 70 are applied to the gusset flaps 23, and similar areas 71 are applied to the gusset flaps 27. The flap structures are folded inwardly along the fold lines 21, and the flaps 23 and 27 are adhered in face contact to the wall panels 14 and 15 respectively. After the

folding operation, the carton appears as indicated in FIGURE 5 of the drawings.

When the carton is to be used, it is normally folded into the form illustrated in FIGURE 2 of the drawings, the carton then having two tray sections 10 and 11 connected by the fold line 12. The tray section 10 has full hexagonal end panels 22, while the tray section 11 has semi-hexagonal end portions. The product B is then placed in the carton, the product usually being placed in the tray section 10. The triangular flaps 32 and 34 are then bent into right angular relation to the end panels 22 the flaps then being in the position indicated in FIGURE 2 of the drawings. The tuck flap 19 is next folded to overlie the triangular flaps 34, and the cover section 11 is swung upwardly over the upper ends of the end walls 22. The tear strip 46 and anchoring flap 49 are folded to lie outwardly of the wall panel 15 and the anchoring flap 49 is adhered in the face contact to the panel 15. During this operation the carton may be rolled over to rest upon the wall panel 14 as shown in FIGURE 1 of the drawings. In other words, while the wall panels 13 and 40 have been described as the bottom panel and top panel respectively, this term is merely a relatively term to simplify the description.

The anchoring flap or glue flap 49 may have preapplied hot melt adhesive thereon if desired. This permits the flap to be adhered to the panel 15 by the use of heat and pressure sufficient to render the adhesive tacky.

When it is desired to open the carton, the tear strip 46 is removed, leaving the anchoring flap adhered to the wall panel 15. The carton may be opened up and the contents removed or partially removed. If it is desired to reclose the carton, this is done by folding the locking wings 62 into substantially right angular relation to the locking tongue 60, and inserting these wings through the slots 64 to lock the carton in reclosed position. When reclosed, the carton appears as indicated in FIGURE 6 of the drawings.

I claim:

1. A hexagonal carton including six rectangular panels hingedly connected in series, a glue flap hinged to an end panel of said series and secured in face contact with the other end panel of the series to hold the panels in hexagonal relation, the first three panels forming a first section including a central bottom panel and two bottom side wall panels, hexagonal closure flaps hinged to the ends of said bottom panel, a pair of triangular gusset flaps connecting the ends of each of said bottom side wall panels to edges of said hexagonal closure flaps, the triangular gusset flap of each pair which is hinged to said side walls being secured in face contact to the side wall panels to which they are hinged, the remaining three panels of said series forming a second section including an intermediate top panel and top side wall panels on opposite sides thereof, a substantially semi-hexagonal closure flap structure hingedly connected to the ends of said panels forming said second section and lying outwardly of said hexagonal closure flap of said first section.

2. A hexagonal carton including:
two tray sections of generally semi-hexagonal cross section hingedly connected together,
one section including an intermediate rectangular bottom panel and a pair of rectangular bottom side wall panels hinged to opposite edges thereof,
an end closure structure hinged to the ends of said panels including generally octagonal closure flaps hinged to the ends of said bottom panel and gusset flap means connecting the ends of said bottom side wall panels to the edges of said octagonal closure flaps on opposite sides of the line of fold connecting said octagonal closure flaps to said bottom panel, said gusset flap means holding said bottom side wall panels substantially coplanar with the edges of said octagonal closure flaps to which they are secured,
the other section including an intermediate top panel

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and a pair of rectangular top side wall panels hinged to opposite edges thereof,
a closure flap structure connected to the ends of said top panel and top side wall panels holding said top side wall panels in angular relation to said top panel to provide a substantially semi-hexagonal tray,
said closure flap structure of said other section lying outwardly of said hexagonal closure flaps,
an anchoring flap hinged to the edge of one section and secured in face contact with the edge of the other section to hold said sections in opposed relation.
3. The structure of claim 2 and including a tuck flap on an edge of the section not supporting said anchoring flap and lying inwardly of the side wall panel of the adjoining section.
4. The structure of claim 2 and in which said anchoring flap is hinged to said other section and is secured to a bottom side wall of said one section.
5. The structure of claim 4 and including a tuck flap hinged to the edge of said one section and lying inwardly of the adjoining top side wall of said other section.
6. The structure of claim 2 and in which said anchoring flap includes a detachable tear strip.
7. The structure of claim 1 and in which said semi-hexagonal flap structure of said second section includes a generally trapezoidal closure flap secured to each end of said top panel, a pair of similar triangular gusset flaps connected between an inclined edge of each said trapezoidal closure flap and one of said top side wall panels, closure flaps secured to the ends of the other of said top side wall panels and adhered in face contact to said trapezoidal closure flaps.
8. A flat glued blank adapted to be folded into a hexagonal carton, the glued blank including:
a series of six rectangular panels hingedly connected together along parallel lines of fold,
said panels comprising in sequence, a first bottom side wall, a bottom wall, a second bottom side wall, a first top side wall, a top wall, and a second top side wall,
a pair of hexagonal closure flaps hinged to the opposite ends of said bottom wall along parallel end wall hinge lines,
a pair of similar triangular gusset flaps connecting each of said first and second bottom side walls to edges of said hexagonal closure flaps on either side of the folded connection between said bottom wall and said hexagonal closure flaps,
a closure flap secured to said top wall having an angular side edge arranged at substantially 60° angle with respect to said end wall hinge lines,

a pair of similar triangular gusset flaps hingedly connected together and hingedly connected to each said first top side wall and to each said angular side edge of said top wall closure flaps,
a closure flap hingedly connected to each of the ends of said second top side wall along said end wall hinge lines,
fold lines extending diagonally across said second top side wall from the junctures between the fold line connecting said second top side wall to said top wall and said end wall hinge lines,
the portions of said second top side wall and between said end wall hinge lines and said diagonal fold lines, together with said second top end wall closure flaps being folded along said diagonal fold lines to overlie portions of said second top side wall and said top wall,
all said closure flaps and said gusset flaps being folded inwardly along said end wall hinge lines to overlie the portions of said blank between said end wall hinge lines,
said top wall closure flaps being secured in face contact with said second top side wall closure flaps, and the triangular gusset flaps hingedly connected to said first bottom side wall closure flaps, said second bottom side wall closure flaps, and said first top wall closure flaps being adhered in face contact to the panels to which they are hinged along said end wall hinge lines.
9. The structure of claim 8 and including a tuck flap hingedly connected to one end panel of said series.
10. The structure of claim 9 and including a cooperable interlocking tongue and groove means on said tuck flap and the other end wall panel of said series.

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DAVIS T. MOORHEAD, Primary Examiner

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229—51