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Wozniacki

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[45] **Oct. 7, 1975**

[54] **CARTON WITH EXTERIOR LEDGE**

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[52] **U.S. Cl.** ..... **229/34 R**

[51] **Int. Cl.²** **B65D 5/22**

[58] **Field of Search** 229/33, 34, 30

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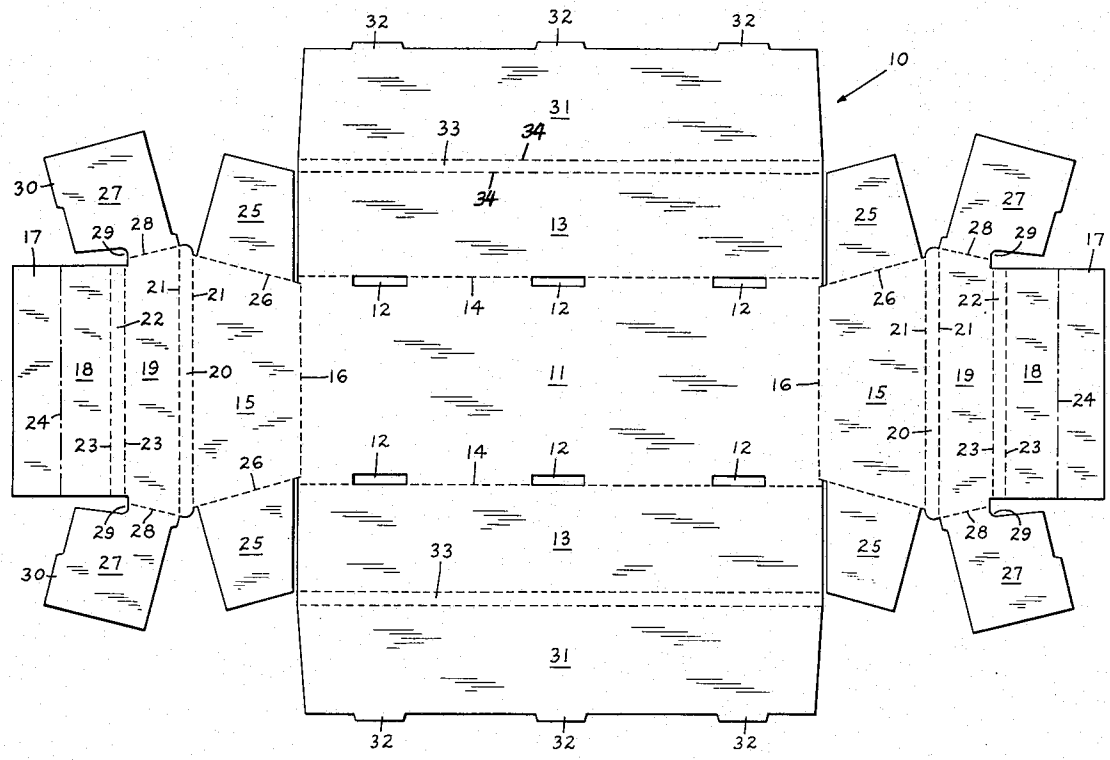
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Attorney, Agent, or Firm—Lawrence W. Flynn

[57] **ABSTRACT**

A single piece, self-locking carton having excellent corner strength and durable integral exterior ledges is described. The carton has bottom, side and end wall panels. Ledge panels foldably attached to the top edge of the end wall panels overlie the outer face of the end wall panels. The ledge panels are shorter than the end wall panels and form a protruding ledge at the top of each end of the carton. The thickness and strength of the ledges is varied by additional panels located between the ledge panels and end wall panels. To provide corner strength, there are two sets of corner connector panels, one set foldably attached to the end wall panels, the other set to the ledge panels. The corner connector panels abut the inner face of the side wall panels. Locking panels foldably attached to the side wall panels overlie the inner face of the side wall panels and sandwich the corner connector panels between them and the side wall panels to maintain the structural integrity of the carton.

9 Claims, 10 Drawing Figures



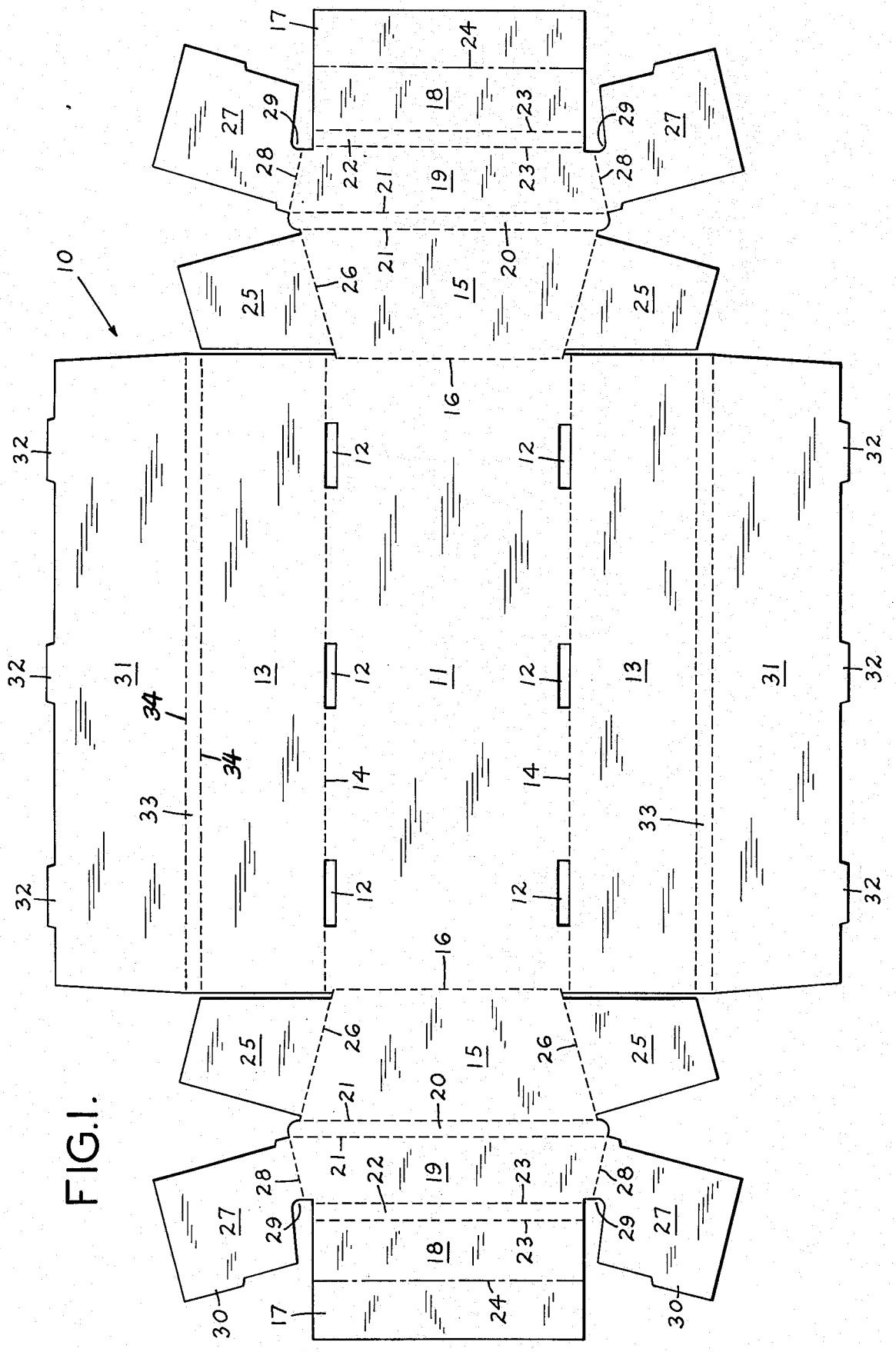

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FIG.1.

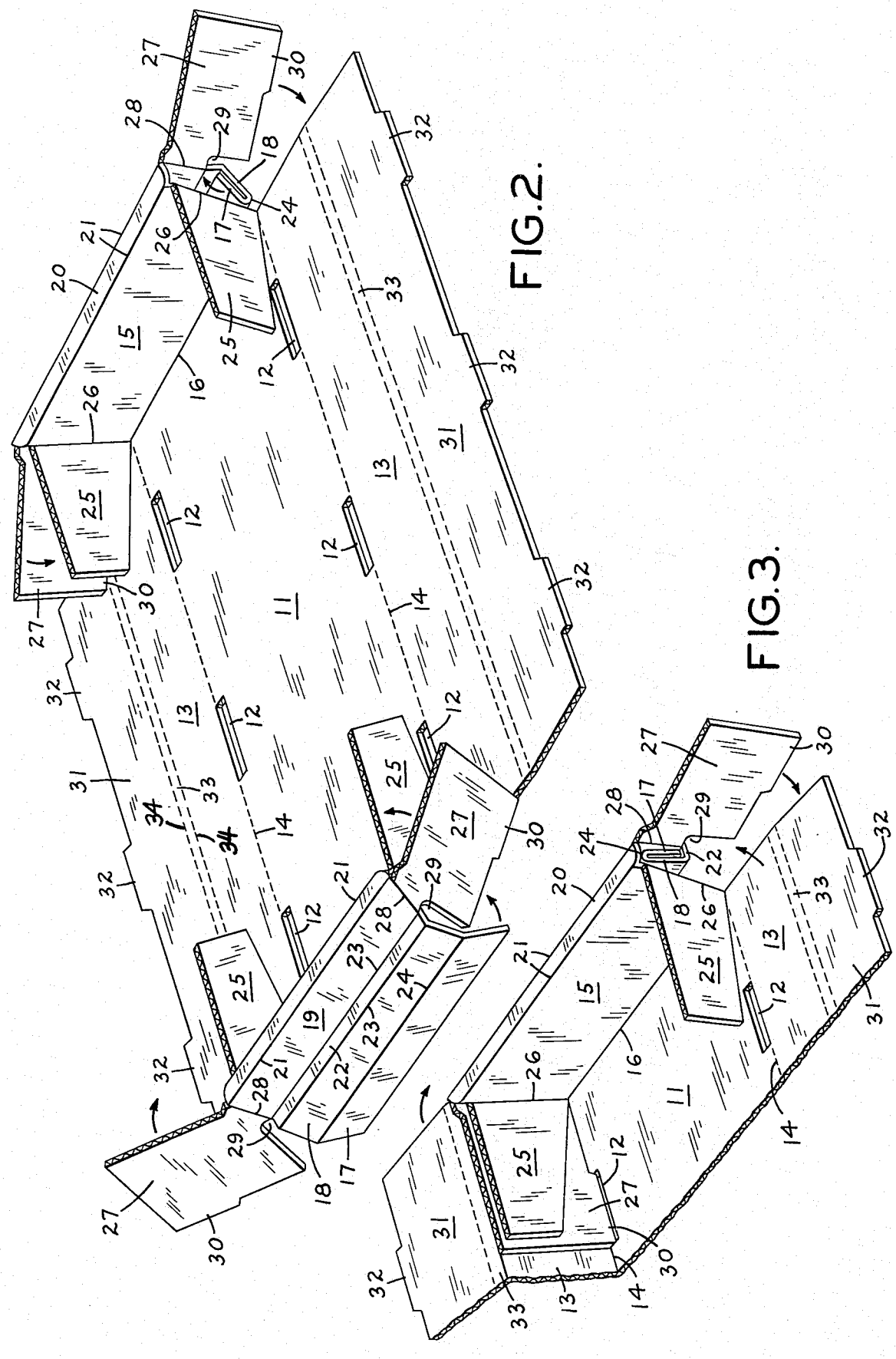


FIG.2.

FIG.3.

FIG.4.

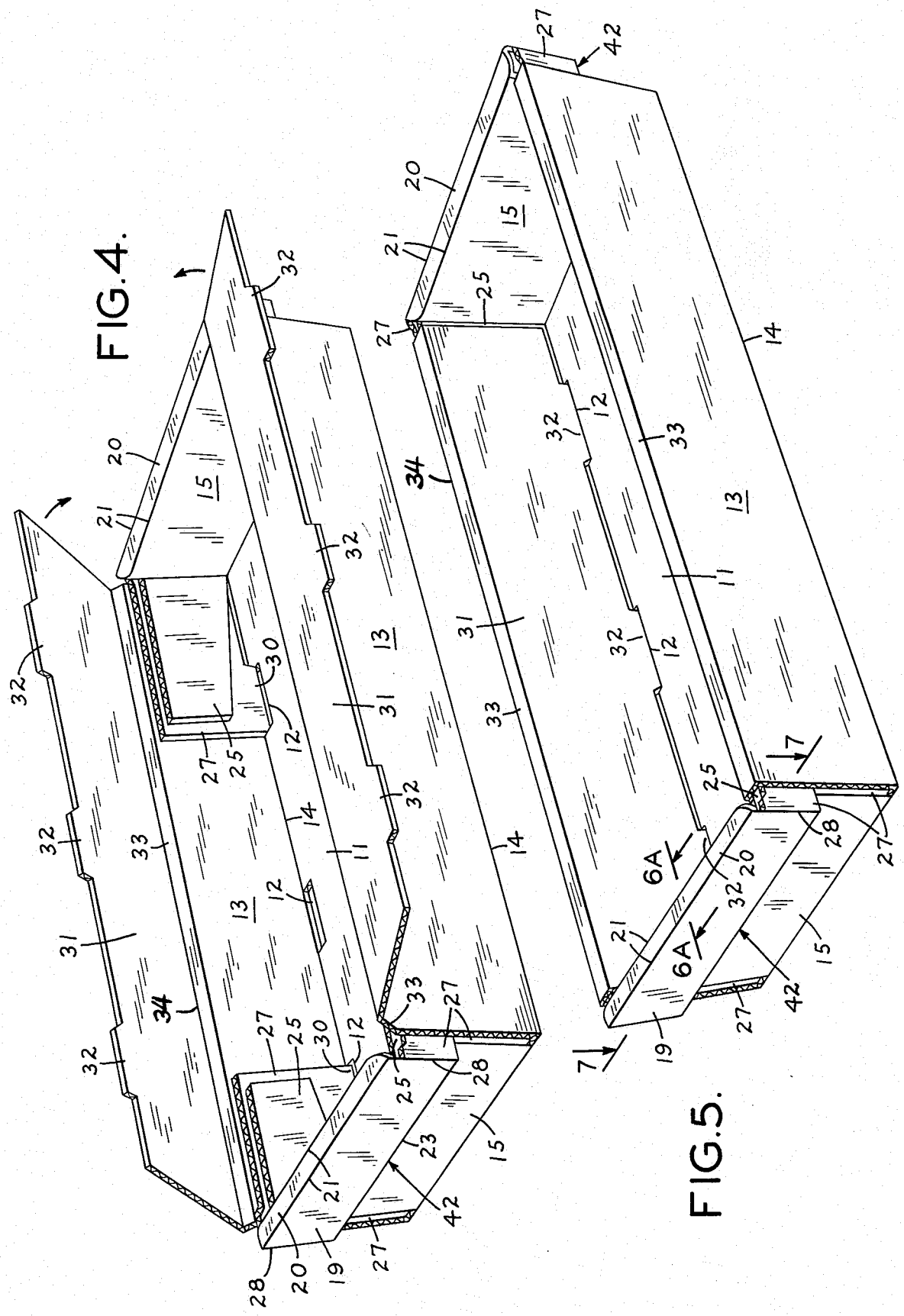
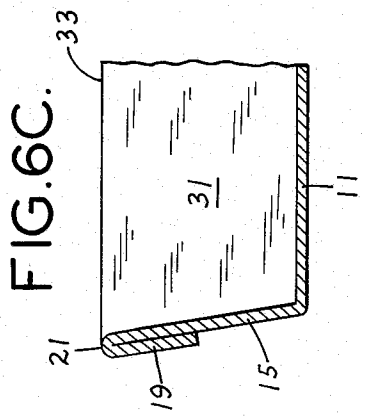
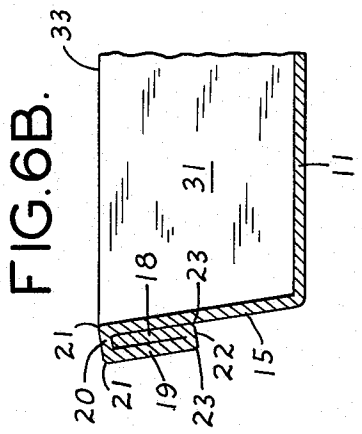
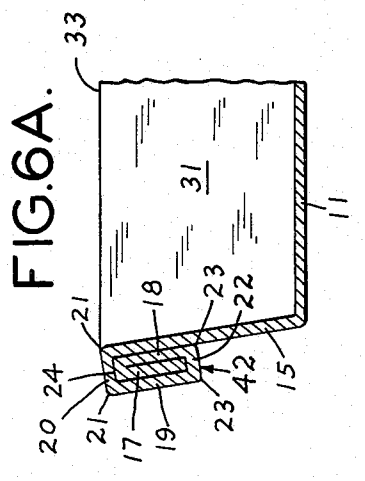
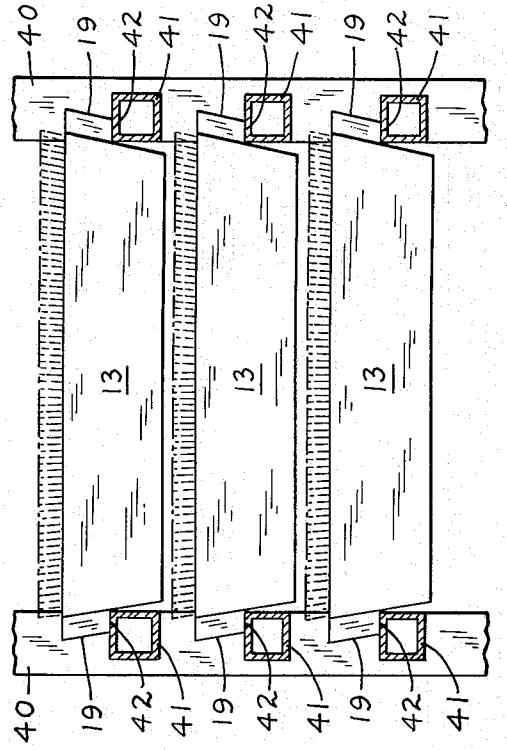


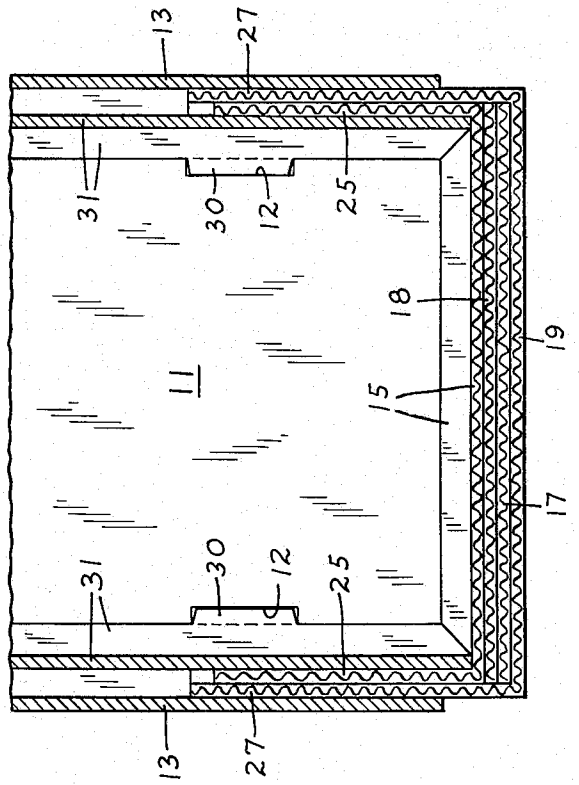
FIG.5.


FIG.6C.
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FIG.6B.
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FIG.6A.
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FIG.8.
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FIG.7.
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CARTON WITH EXTERIOR LEDGE

BACKGROUND OF THE INVENTION

This invention relates to a rugged single piece carton having high corner strength and durable integral ledges on the carton exterior. The carton is preferably made of corrugated paperboard and has self-locking features.

Although the carton has many uses, it is particularly useful as a tray for storing, handling and transporting items such as envelopes, letters, stationery, mail, and the like. It finds particular utility as a stationery, for use in conjunction with wheeled tray carrying racks of the type commonly used by the United States Postal Service. One such rack is described in U.S. Pat. No. 2,928,681. Such racks are designed to accommodate a large number of individual trays of mail in a multi-layered arrangement. The racks have metal guide runners which cooperate with ledges formed on the exterior of the tray to support the trays in the rack. The ledges normally rest on the runner so that virtually the entire weight of the tray is supported by the ledges. Heretofore, such trays were often made of plastic and were sufficiently expensive that they were not considered "disposable" items. As will become apparent, the present invention provides a disposable alternate to such plastic trays which can be inexpensively fabricated from corrugated paperboard. Although corrugated paperboard is used, the cartons of the invention, because of their unique construction, have exceptionally strong and durable exterior ledges and excellent corner strength.

SUMMARY OF THE INVENTION

The carton of the present invention has a bottom panel to which end wall and side wall panels are foldably attached. To provide the exterior ledges, ledge panels are foldably attached to the top edge of the end wall panels. These ledge panels are generally of a smaller height dimension than the end wall panels and overlie the outer face of the end wall panel to form an exterior ledge at the top of each end of the carton. The thickness and strength of the ledge can be increased by placing additional panels between the ledge panels and the wall panels. To provide corner strength two sets of corner connector panels are used, one set foldably attached to the side edges of the end wall panels and the other foldably attached to the side edges of the ledge panels. These corner connector panels overlie the inner face of the side wall panels with the first corner connector panels located interiorly of the second corner connector panels. The structural integrity of the carton is maintained by locking panels foldably attached to the upper edge of the side wall panels which overlie the inner face of the side wall panels and sandwich the first and second corner connector panels between them.

The invention is described more specifically below in conjunction with preferred embodiments and the accompanying drawings illustrating these embodiments.

BRIEF DESCRIPTION OF THE DRAWNGS

FIG. 1 is a single piece blank from which a preferred embodiment of the carton is formed.

FIGS. 2–5 are perspective views showing the assembly of the blank of FIG. 1 into a completed carton, with the completed carton shown in FIG. 5.

FIG. 6A is a sectional view taken along the line 6A—6A in FIG. 5.

FIGS. 6B–6C are sectional views similar to FIG. 6A showing other embodiments of the ledge structure of the carton.

FIG. 7 is a sectional view taken along the line 7—7 in FIG. 5.

FIG. 8 is a partial front sectional view illustrating the use of the carton in conjunction with a carrying rack for the carton.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 depicts a pre-scored single piece blank **10** from which a preferred embodiment of the carton can be prepared. The blank comprises a rectangular bottom panel **11** containing a plurality of spaced apertures or slots **12** along its side edges. A pair of generally rectangular side wall panels **13** are foldably attached to opposite edges of panel **12** by score lines **14.** Similarly, a pair of generally rectangular but slightly tapered end wall panels **15** are foldably attached to opposite edges of panel **12** by score lines **16.** The purpose of the taper is to provide a carton whose walls slope slightly inwardly instead of being completely erect.

The exterior ledges of the carton are formed from the three panels **17, 18, 19** which are foldably interconnected in series, with end panel **19** of the series being foldably attached to the top edge of end wall panel **15.** When the blank is assembled, panel **19** becomes an outer ledge panel while panels **17, 18** become inner ledge panels. Panels **17, 18** are primarily intended to add thickness and strength to the ledges. Panel **19** is foldably attached to panel **15** by an intermediate thin shoulder panel **20** and the score lines **21** at opposite edges of shoulder panel **20.** In the same fashion, inner ledge panel **18** is foldably attached to outer ledge panel **19** by a thin shoulder panel **22** and the score lines **23** at opposite edges of shoulder panel **22.** The other inner ledge panel **17,** for reasons which become apparent when the assembly of the blank is described, is foldably attached to adjoining panel **18** by a slit score line **24.**

The end structure of the carton is connected to the side structure by a first set of corner connector panels **25** which are foldably attached to the side edges of the end wall panels **15** along score lines **26,** and by a second set of corner connector panels **27** which are foldably attached to the side edges of the outer ledge panel **19** along score lines **28.** Panels **27** have a small cut-out **29** so part of panel **27** does not extend below the ledges in the assembled blank. Panels **27** also contain a tab **30** which upon assembly of the blank fits into the slots **12** of bottom panel **11** to assist in holding panels **27** in place.

To maintain the structural integrity of the carton, there are locking panels **31** foldably attached to the upper edges of side wall panels **13.** Panels **31** have at their bottom edge tabs **32** which upon assembly of the blank fit into the slots **12** of panel **11** to assist in holding panels **30** in place. Panels **31** are foldably attached to panels **13** by a thin intermediate shoulder panel **33** and the score lines **34** at opposite edges of panel **33.** In cases where the fold mechanism between adjoining panels includes a thin intermediate shoulder panel between the adjoining panels, it will be seen that additional panels are intended to be located between the two foldable panels. The intermediate shoulder panel provides the space required to accommodate these additional panels while at the same time facilitating the

foldability of the two adjoining panels. While shoulder panels are preferred under such circumstances, it is to be understood that they are in no way essential. It will also become apparent that in the assembled carton, the shoulder panels provide flat, smooth surfaces which are aesthetically pleasing and functionally desirable.

The sequential assembly of the blank is shown in FIGS. 2–5. Referring to FIG. 2, the end wall panels **15** are elevated along fold lines **16** into an erected position. The outer ledge panel **19** are then folded downwardly toward the outer face of end panel **15** but not flush against panel **15.** Inner ledge panels **17** are then folded inwardly against inner ledge panels **18** along the slit score line **24** until panels **17** are in face to face relation with panels **18** as shown in FIG. **2.** For this reason, a slit score line is required between panels **17** and **18.** Panels **18** are then folded upwardly against the outer ledge panels **15** to sandwich panel **17** between them and panels **19,** as shown in FIGS. **3** and **6A.** In effect, the inner ledge panels **17, 18** have been sequentially folded one on top of the other to produce a stack in which the panels **17, 18** rest on top of each other. This stack is then located between the outer ledge panels **19** and the end wall panels **15** to add thickness and strength to the ledges (see FIGS. **3** and **6A**). Although only the two inner edge panels **17, 18** are shown in the drawings, a plurality of such panels could be used in place of panels **17, 18,** with the panels foldably attached to each other in series. An end panel of the series could then be foldably attached to the outer ledge panel **19** in a manner similar to that by which panels **18** are shown to be attached to panel **19.** In such a case, these panels would be sequentially folded one on top of the other to produce a stack of the panels which would be located between the outer ledge panel **19** and the end wall panels. Similarly, in certain cases, panel **17,** or both panels **17** and **18,** could be omitted having as the respective ledge panels only panels **18** and **19,** or **19** alone (see FIGS. **6B–6C**).

Once inner ledge panels **17** and **18** are folded into place between outer ledge panel **19** and the end wall panels **15,** the corner connector panels **25** and **27** are folded inwardly toward the bottom panel **11** along score lines **26, 28,** respectively, until they come into approximate alignment with the scored side edges **14** of bottom panel **11,** as shown in FIGS. **3, 4** and **7.** Panels **25** and **27** are in face to face relation, with panel **25** located interiorly of panel **27.** The tabs **30** on the bottom edge of panels **27** are then inserted into the slots **12** in the bottom panel **11** to hold the corner connector panels in place. The inclusion of tabs **30** on panels **27** is an optional feature and an acceptable carton can be prepared without tabs **30.**

The side wall panels **13** are then folded upwardly along score lines **14** as shown in FIGS. **3–4** until panels **13** are in face to face relation with the outer face of corner connector panels **27.** The locking panels **31** are then folded inwardly until they overlie the inner face of side wall panels **13** and the corner connector panels **25,** 27 as shown in FIGS. **4, 5** and **7.** The tabs **32** at the bottom edge of the locking panels are then inserted into the slots **12** in bottom panel **11** to frictionally hold the locking panels **31** in place. Any suitable means for holding the locking panels in place other than tabs **32** and apertures **12** could be used. For example, panels **31** could be stapled, glued or otherwise attached to side wall panels **13** and/or corner connector panels **25, 27.**

In the completed carton shown in FIG. **5,** the corner connector panels **25, 27** are sandwiched between the side wall and locking panels as best shown in FIG. **7.** This arrangement maintains the structural integrity of the carton by holding the end wall panels in an erect position. End wall panels **13** cannot collapse outwardly because the top edges of corner connector panels **25,** 27 would strike the underside of shoulder panel **33** to prevent this. With the stability of the end wall panels assured, the corner connector panels then function, by their insertion between the side wall and end wall panels, to prevent collapse of the side wall panels.

The use of two corner connector panels as shown in FIG. **7** provides a strong corner structure for the carton. As pointed out above, the thickness of the ledges can be varied by eliminating one or both of the inner ledge panels **17, 18.** These modifications are shown in FIGS. **6B–6C,** respectively. Of course, additional inner ledge panels could also be used. In such case, the additional panels could be foldably attached to the edge of panels **17** opposite that which attaches panels **17** to panels **18.** It would also be possible to use as the inner ledge panels, panels which were not necessarily attached to the blank at all. For example, a separate detached panel or a separate detached stack of panels could be inserted between outer ledge panels **19** and the end wall panels, and if necessary, glued or otherwise attached to the carton structure to thicken and strengthen the carton ledges.

In the assembled carton of FIG. **5,** it is seen that the shoulder panels **20** and **33** cooperate to form a broadened, smooth, flat peripheral rim around the top of the carton. This rim imparts an attractive, finished appearance to the carton. The shoulder panel **22** on the other hand provide a smooth underside for the ledge structure as best shown in FIGS. **6A** and **6B,** which facilitates manual handling of the carton, especially a loaded carton, since the carton will ordinarily be grasped by the ledge with the fingers in contact with the underside of the ledge.

The dimensions and shape of the carton, the blank and the various panels of the carton can vary considerably without departing from the scope of the invention. For example, although the embodiment shown in the drawings has walls with a slight inward taper, the walls could just as well be made upright without a taper by modifying in known manner those score lines of the blank which are responsible for the tapering.

The carton can be fabricated from any suitable material. Corrugated paperboard is a preferred material because it is relatively inexpensive and readily available. Different thickness of the corrugated paperboard can be used and if a thicker variety of paperboard, such as double-wall paperboard, is used, the ledge structure may require only a single ledge panel, such as the outer ledge panel **19,** for the required thickness and strength. Single-wall paperboard, as shown in the drawings, is a preferred material for the carton and when single-wall paperboard is used, it is preferable to use one or more inner ledge panels, such as panels **17, 18,** to provide added thickness and strength for the ledges.

FIG. **8** illustrates the use of the carton in a tray-carrying rack. Such racks usually comprise a frame structure consisting of a number of braced vertical beams **40** which support a plurality of horizontal guide runners **41** on which the trays are slidably mounted within the rack. As shown in FIG. **8,** the carton of this

invention is supported in the rack by the exterior ledges **42** of the carton resting on the runners **41.** This arrangement allows the cartons to slide along the runners while at the same time they are guided to move in a fixed direction.

The descriptive matter and other specific information presented above was for purposes of illustration only, and such alterations or modifications thereof as would be within the capabilities of those skilled in the art are deemed to fall within the scope and spirit of the invention, bearing in mind that the invention is defined only by the following claims.

What is claimed is:

1. A carton comprising:

a bottom panel with foldably attached side and end wall panels, said bottom panel containing peripheral apertures;

outer ledge panels of a smaller height dimension than the end wall panels foldably attached to the top edge of the end wall panels and overlying the outer face of the end wall panels;

inner ledge panels of a smaller height dimension than the end wall panels attached to that edge of the outer ledge panels opposite that which attaches the outer ledge panels to the end wall panels, the inner ledge panels located between the outer ledge panels and the end wall panels, the outer and inner ledge panels cooperating to form at the top of each end of the carton a ledge on the carton exterior;

first corner connector panels foldably attached to opposite side edges of the end wall panels and overlying the inner face of the side wall panels;

second corner connector panels foldably attached to opposite side edges of the outer ledge panels and overlying the inner face of the side wall panels, the second corner connector panels located between the first corner connector panels and the side wall panels and having tabs which fit in the apertures of the bottom panel;

locking panels foldably attached to the top edge of the side wall panels and overlying the inner face of the side wall panels, the first and second corner connector panels located between the side wall panels and the locking panels, the locking panels having tabs at the bottom edge which fit in the apertures of the bottom panels to hold the locking panels in position.

2. The carton of claim **1** further including an additional panel of a smaller height dimension than the end wall panels foldably attached to that edge of the inner ledge panels which attaches the inner ledge panels to the outer ledge panels, said panel located between the inner and outer ledge panels to further thicken the ledges on the carton exterior.

3. A single unit blank comprising:

a bottom panel with foldably attached side and end wall panels, said bottom panel having peripheral apertures;

outer ledge panels of a smaller height dimension than the end wall panels foldably attached to the top edge of the end wall panels by an intermediate shoulder panel;

inner ledge panels of a smaller height dimension than the end wall panels foldably attached by an intermediate shoulder panel to that edge of the outer ledge panels opposite that which attaches the outer ledge panels to the end wall panels;

first corner connector panels foldably attached to opposite side edges of the end wall panels;

second corner connector panels foldably attached to opposite side edges of the outer ledge panels; and

locking panels foldably attached to the top edge of the side wall panels by an intermediate shoulder panel, the locking panels having tabs along the edge opposite that which connects the locking panels to the side wall panels which are adapted to fit in the apertures of the bottom panel in the assembled blank.

4. A carton comprising:

a bottom panel with foldably attached side and end wall panels, said bottom panel having peripheral apertures;

outer ledge panels of a smaller height dimension than the end wall panels foldably attached to the top edge of the end wall panels by an intermediate shoulder panel and overlying the outer face of the end wall panels;

inner ledge panels of a smaller height dimension than the end wall panels attached by an intermediate shoulder panel to that edge of the outer ledge panels opposite that which attaches the outer ledge panels to the end wall panels, the inner ledge panels located between the outer ledge panels and the end wall panels, the outer and inner ledge panels cooperating to form at the top of each end of the carton a ledge on the carton exterior;

first corner connector panels foldably attached to opposite side edges of the end wall panels and overlying the inner face of the side wall panels;

second corner connector panels foldably attached to opposite side edges of the outer ledge panels and overlying the inner face of the side wall panels, the second corner connector panels located between the first corner connector panels and the side wall panels;

locking panels foldably attached to the top edge of the side wall panels by an intermediate shoulder panel and overlying the inner face of the side wall panels, the first and second corner connector panels located between the side wall panels and the locking panels, the locking panels having tabs at the bottom edge which fit in the apertures of the bottom panels to hold the locking panels in position.

5. A carton comprising:

a bottom panel with foldably attached side and end wall panels;

a ledge panel foldably attached to the end wall panels by an intermediate shoulder panel and overlying the outer face of the end wall panels;

first corner connector panels foldably attached to opposite edges of the end wall panels and overlying the inner face of the side wall panels;

second corner connector panels foldably attached to opposite edges of the ledge panel and overlying the inner face of the side wall panels;

locking panels foldably attached to the side wall panels by an intermediate shoulder panel and overlying the inner face of the side wall panels, the corner connector panels located between the side wall panels and the locking panels, said intermediate shoulder panels forming a broadened, flat peripheral rim around the top of the carton; and

means maintaining the locking panel in said position.

6. A carton comprising:
a bottom panel with foldably attached side and end wall panels, said bottom panel containing peripheral apertures;
a ledge panel foldably attached to the end wall panels and overlying the outer face of the end wall panels;
first corner connector panels foldably attached to opposite edges of the end wall panels and overlying the inner face of the side wall panels;
second corner connector panels foldably attached to opposite edges of the ledge panel and overlying the inner face of the side wall panels, said second corner connector panels having tabs which fit in the apertures of the bottom panel;
locking panels foldably attached to the side wall panels and overlying the inner face of the side wall panels, the corner connector panels located between the side wall panels and the locking panels; and
means maintaining the locking panel in said position.

7. A single unit blank comprising:
a bottom panel with foldably attached side and end wall panels, said bottom panel containing peripheral apertures;
outer ledge panels of a smaller height dimension than the end wall panels foldably attached to the top edge of the end wall panels;
inner ledge panels of a smaller height dimension than the end wall panels foldably attached to that edge of the outer ledge panels opposite that which attaches the outer ledge panels to the end wall panels;
first corner connector panels foldably attached to opposite side edges of the end wall panels;
second corner connector panels foldably attached to opposite side edges of the outer ledge panels and having tabs which are adapted to fit in the apertures of the bottom panel in the assembled blank; and
locking panels foldably attached to the top edge of the side wall panels, the locking panels having tabs along the edge opposite that which connects the locking panels to the side wall panels which are adapted to fit in the apertures of the bottom panel in the assembled blank.

8. A single unit blank comprising:
a bottom panel with attached side and end wall panels;
a ledge panel attached to the end wall panels by an intermediate shoulder panel;
first corner connector panels attached to the end wall panels;
second corner connector panels attached to the ledge panels; and
locking panels attached to the side wall panels by an intermediate shoulder panel which, in the erected blank, cooperates with the intermediate shoulder panel which attaches the ledge panels to the end wall panels to form a broadened, flat peripheral rim around the top of the erected blank.

9. A single unit blank comprising:
a bottom panel with attached side and end wall panels, said bottom panel containing peripheral apertures;
a ledge panel attached to the end wall panels;
first corner connector panels attached to the end wall panels;
second corner connector panels attached to the ledge panels and having tabs which are adapted to fit in the apertures of the bottom panel in the assembled blank; and
locking panels attached to the side wall panels.

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