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(12) # EUROPEAN PATENT APPLICATION

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(54) **Container and blank for constructing same.**

(57) A thermoplastic coated square or rectangular container suitable for being filled with a juice concentrate which is frozen after filling, and having a top closure arrangement adapted to being readily fully opened to permit the frozen juice to be discharged through the top opening thereof. The top closure arrangement includes narrow edge panels on three sides thereof, with panel segments connected to each by weakened or perforated lines. The segment connected to the front edge panel is folded back onto itself around the weakened or perforated line and includes a lift tab extending therefrom. A cover panel is secured to the two side edge panels and the three panel segments such that the cover panel is peeled away from the three edge panels by manually lifting the lift tab and breaking the three weakened lines, to cause the three panel segments to be lifted with the cover panel. Hence, there is provided a substantially completely open top for discharging the frozen juice concentrate therethrough.

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CONTAINER AND BLANK FOR CONSTRUCTING SAME

This invention relates generally to thermoplastic coated paperboard containers and, more particularly, to a blank and a container including a flat top end closure of an improved construction.

Containers for beverages such as milk, cream, other dairy products, juices, and the like, are conventionally constructed from thermoplastic coated paperboard. Typically, these containers include a top end closure with a folded gable roof having a vertically projecting seal at the roof ridge for sealing the container and providing a readily available pouring spout when the contents of the container are to be dispensed.

Coated paperboard blanks for constructing such a container are made on converting machines similar to those disclosed by Monroe et al. Patent No. 2,682,208 and Earp Patent No. 3,731,600. After construction, the blanks are processed by forming, filling and sealing machines, such as those disclosed by Monroe et al. Patent No. 3,303,761, Allen Patent No. 3,918,236, Egleston Patent No. 3,398,659 or Young Patent No. 4,193,833, to produce the formed, filled and sealed containers of the type referred to above and shown and described in Egleston et al. Patent Nos. 3,270,940 and 3,120,335.

While this type of container has been generally satisfactory for liquid products, a similar square or rectangular thermoplastic coated paperboard container with a non-gable, flat top closure arrangement may be used for frozen juices, in lieu of the well known cylindrical paperboard container with a removable metal or solid plastic top cover. A suitable top closure arrangement for frozen juices is shown and described in Lisiecki Patent No. 4,397,415.

However, it is desirable to modify the latter structure so as to assure that the opening process occurs smoothly and easily, and without fiber tear along the sealed edges.

Accordingly, a general object of the invention is to provide a blank for a frozen juice container including improved top closure means for attaining the above mentioned desirable results.

Another object of the invention is to provide an improved thermoplastic coated paperboard container suitable for being filled with a juice concentrate and frozen, and then capable of being readily and smoothly opened without evidencing fiber tear.

A further object of the invention is to provide a square or rectangular paperboard container including an improved non-gable type, flat top closure arrangement.

A still further object of the invention is to provide a flat top container including two short side edge panels having perforations along the lengths thereof, a front edge panel which is adaptable to being sealed at the ends thereof to the side edge panels, while including an extention connected thereto by perforations and being folded at the perforations back across itself such that a lift tab extends beyond the front body panel, and a cover panel integrally connected to the top of the back body panel and adapted to fold across the entire top of the container and be sealed to the side and front edge panels.

Other objects and advantages of the invention will become more apparent when reference is made to the following description and accompanying drawings.

Figure 1 is a fragmentary layout view of the outside surface of a coated paperboard container blank used to construct a container having a top end closure in accordance with the present invention;

Figure 2 is an enlarged fragmentary view showing the container evolved from the blank of Figure 1 in a pre-top sealed condition;

Figure 3 is an enlarged fragmentary perspective view showing the container evolved from the blank of Figure 1 in a closed condition; and

Figure 4 is a fragmentary perspective view showing the container of Figure 3 after the top closure thereof has been opened.

Referring now to the drawings in greater detail, Figure 1 illustrates a container blank 10 formed in accordance with the principles of the present invention. The container blank 10 is generally divided into three sections including a top end closure 12, a body portion 14, and a flat bottom end closure (not shown). The latter may be any suitable end closure arrangement and is not a part of this invention.

More specifically, staggered top horizontal score lines 16a, 16b, 16c, 16d and 16e extend transversely across the container blank 10 and separate the top end closure 12 and the body portion 14. As shown in Figure 1, score lines 16a and 16e are at the highest elevation, score lines 16b and 16d are located below the score lines 16a and 16e a distance substantially equal to the thickness of the paperboard, and the score line 16c is the same distance below the score lines 16b and 16d. A bottom horizontal score line (not shown) extends transversely across the container blank 10 and separates the bottom end closure (not shown) and the

body portion 14. The body portion 14 comprises a plurality of integrally connected body panels, namely, a back panel 18, a side panel 20, a front panel 22 and a side panel 24, and a side seam flap or narrow fifth panel 26 formed adjacent the panel 24. The container blank 10 is defined on its longitudinal sides by its edges 28 and 30. The body panels 18, 20, 22 and 24, and the side seam flap 26, are defined by vertical score lines 32, 34, 36 and 38. It should be apparent that the body panels may be equal in width and hence, adaptable to forming a square cross-section container, or may be formed such that one pair of alternate body panels is wider than the other pair and, hence, adaptable to forming a rectangular cross-section container.

The top end closure 12 comprises side fold-in edge panels 40 and 42. The panels 40 and 42 include respective segments 44 and 46 connected to the body panels 20 and 24 at the score lines 16b and 16d, and extended segments 48 and 50 connected to the segments 44 and 46 by respective weakened lines 52 and 53, such as perforated lines or partial cuts. The segments 48 and 50 are each narrower than the respective adjacent segments 44 and 46 by virtue of rectangular spaces 54 and 55 being formed adjacent the respective outer edges of the segments 48 and 50. A cover panel 56 and a front edge panel 58 are connected integrally to the body panels 18 and 22, respectively, at the score lines 16a and 16c. A further panel 60is connected integrally to the upper end of the side seam flap 26 at the score line 16e. A diagonal score line 62 extends from the juncture of the score lines 16b and 32 across the segment 44 to the juncture of the segments 44 and 48, forming a triangular fold-over panel segment 64. A diagonal score line 66 likewise extends from the juncture of the score lines 16d and 38 across the segment 46 to the juncture of the segments 46 and 50, forming a triangular fold-over panel segment 68.

Alternately, for improved carton top configuration, it may be desirable to move the point of intersection of the

diagonal score lines 63 and 66 from the junctures of the vertical and horizontal score lines 16b and 16d apart from the vertical score lines 32 and 36, causing the panel segments 64 and 68 to be substantially trapezoidal in shape.

The front edge panel 58 includes a fold-in segment 70 connected to the body panel 22 at the score line 16c, and a narrower segment 72 extending from the panel segment 70, with a weakened line 74, such as a perforated line or a partial cut, formed therebetween. A horizontal score line 76 is formed across the panel segment 72 at a distance from the perforations 74 approximately equal to the height of the panel segment 70, separating the segment 72 into a fold-out portion 72a and a fold-back portion 72b, the latter to become a lift tab, as will be explained. Oppositely disposed diagonal score lines 78 and 80 are formed on the panel segment 70. The diagonal score line 78 extends from the juncture of the score lines 16c and 34 to the right hand (Figure 1) juncture of the free cut edges of the panel segment 70 and the portion 72a, producing a triangular fold-over panel portion 82. The diagonal score line 80 extends from the juncture of the score lines 16c and 36 to the left hand juncture of the free cut edges of the panel segment 70 and the portion 72a, producing a triangular fold-over panel portion 84.

As indicated above with respect to the diagonal score lines 62 and 66, the diagonal score lines 78 and 80 may be moved away from the respective junctures of the adjacent vertical and horizontal score lines to points on the horizontal score line 16c apart from the respective vertical score lines 34 and 36.

The container blank 10 illustrated in Figure 1 is first formed into a side seam blank in the customary manner by rotating the body panel 24 and the side seam flap 26 as a unit about the vertical score line 36, and having the inside surfaces of the body panel 24 come into contact with the

inside surface of the body panel 22, with the vertical score line 38 positioned next to the vertical score line 34, and with the inside surface of the side seam flap 26 contacting the inside surface of the body panel 20 adjacent the vertical score line 34. The body panel 18 is then rotated about the vertical score line 32 to bring its inside surface into contact with the inside surface of the body panel 20. The inside surface of the body panel 18 along the edge 28 comes into contact with the outside surface of the side seam flap 26, and the edge 28 is positioned parallel and aligned with the vertical score line 38. The various members of the top end closure 12 and the bottom end closure will make similar movements. The container blank 10 is then sealed where the inside area of the body panel 18 comes into contact with the outside surface of the side seam flap 26.

In the Figure 1 structure, if desired, in the formation of the side seam blank the side seam panel 26 could be sealed to the outside surface of the adjacent back panel 18, rather than to the inner surface thereof as described above.

Inasmuch as the eventual top closure arrangement of the invention is a non-gable, flat top configuration, it has been proven to be more compatible with existing forming, filling and sealing machines to form the top closure first, in a manner heretofore used for a conventional bottom closure arrangement. Then, after filling the container through the open end, the panels associated therewith are closed and sealed in any suitable manner.

Accordingly, after the side seam blank is opened up into a squared condition, the various parts of the eventual top end closure 12 are folded on the various score lines in the following manner so as to form the top end structure. The front edge panel 58 is folded or bent inwardly on the score line 16c and outwardly about the weakened or perforated line 74, and then downwardly about the score line 76, resulting in the fold-out panel portion 72a engaging the

fold-in panel segment 70, and the fold-back panel portion 72b engaging the upper end of the front body panel 22. Such action will have caused the panel segment to begin to bend along the diagonal score lines 78 and 80. The full side edge panels 40 and 42 are next folded or bent inwardly toward each other, causing the panel portions 82 and 84 to be pressed downwardly into engagement with the panel segment 70, while bending along the respective diagonal score lines 62 and 66. Finally, the cover panel 56 is folded or bent inwardly and downwardly, causing the panel portions 64 and 68 to be pressed downwardly into engagement with the respective panel segments 44 and 46.

The sealing of the interrelated elements of the top closure 12 is then accomplished by conventional means, such as a sonic or high frequency vibration sealing means. The sealing of the various top end closure elements may also be accomplished by other means, such as gas heat, if desired. Figure 3 illustrates the top end closure 12 structure once the sealing thereof has been effected. While the cover panel 56 is tightly sealed adjacent the upper ends of the body panels 20, 22 and 24 for a width equivalent to the heights of the panels 40, 42 and 70, the lift tab 72b may be merely spot welded to the cover panel 56 for easy release therefrom. It should be noted that, if desired, the lift tab 72b may be folded down onto the upper portion of the front body panel 22, rather than back onto the cover panel 56.

In opening the carton, the lift tab formed by the panel portion 72b is lifted from the cover panel 56 or the front body panel 22. Continued lifting of the lift tab serves to pull the panel portion 72a away from the panel segment 70, breaking the weakened line 74 and, as the lift tab 72b is raised still further, the cover panel 56 is pulled away from the side edge panel segments 44 and 46, with a clean break along the weakened lines 52 and 54, as shown in Figure 4. Simultaneously, the four fold-down panels 82, 84, 64 and 68

are partially lifted up from the panel segments 70 at the front and 44 and 46 at the back, causing the remaining panel segments 70, 44 and 46 to be free to swing into a vertical mode about the respective score lines 16c, 16b and 16d, thus providing a substantially completely open top for discharge of frozen or semi-frozen juice contents.

It should be apparent that the invention provides a novel and efficient thermoplastic coated paperboard carton which is ideally suited for being filled with a juice concentrate, such as orange juice concentrate, for example, and then adapted to being readily opened, with minimal fiber tear, for removal of the contents.

While but one embodiment of the invention has been shown and described, other modifications thereof are possible.

CLAIMS

1. A thermoplastic coated blank for constructing a container, the blank comprising:

(a) body panels including front and back panels and a pair of side panels;

(b) a side fold-in edge panel including a full width segment integrally connected to the top end of each of the pair of side panels, and a reduced width segment connected by a weakened line to each full width segment;

(c) a front edge panel integrally connected to the top end of the front panel and including a fold-in segment and a fold-out segment, the fold-in and fold-out segments being interconnected by a weakened line, and a score line formed across the width of the fold-out segment at a distance away from the weakened line equal to the height of the fold-in panel segment;

(d) a cover panel integrally connected to the back panel;

(e) a diagonal score line formed on each of the side fold-in edge panels at the end thereof away from the front edge panel, the diagonal score lines converging in an upwardly direction; and

(f) an additional diagonal score line formed on the front fold-in panel segment adjacent each of the side fold-in

edge panels, converging in an upward direction.

2. A thermoplastic coated container, comprising:

(a) body panels including front and back panels and a pair of side panels;

(b) a side fold-in edge panel including a full width segment integrally connected by a first horizontal score line to the top end of each of the pair of side panels and folded on the first horizontal score line inwardly toward one another, and a reduced width segment connected by a weakened line to each full width segment;

(c) a front edge panel integrally connected by a second horizontal score line to the top end of the front panel and including a fold-in segment, and a fold-out segment having a fold-out portion and a fold-down portion, the fold-in segment folded on the second horizontal score line;

(d) a weakened line interconnecting the fold-in and fold-out segments such that the fold-out segment is folded on the weakened score line onto and secured to the fold-in segment;

(e) a cover panel integrally connected by a third horizontal score line to the back body panel and folded on the third horizontal score line onto and secured to the side fold-in edge panels and to the fold-out panel

portion;

(f) a score line interconnecting the fold-out and fold-back portions such that the fold-back portion is folded on the score line onto and selectively secured to one of the cover panel and the front body panel;

(g) a diagonal score line formed on each of the side fold-in edge panels so as to form a corner segment on the end of each fold-in edge panel adjacent the end thereof away from the front edge panel, the corner segment being sealed to the side fold-in edge panel beneath the cover panel;

(h) an additional diagonal score line formed on the front fold-in panel adjacent the respective side fold-in edge panels, providing corner segments thereon, the corner segments being sealed to the front fold-in panel beneath the cover panel; and

(i) the fold-back panel portion serving as a lift tab for manually opening the top closure by progressively lifting the tab away from the panel to which it is secured, lifting the cover panel away from the front fold-in panel segment, and thence away from the corner segments and the side fold-in edge panels, with the fold-out panel segment and breaking the weakened

line therebetween to stay with the cover panel, and with the reduced width segments separating from the respective full width segments by breaking the weakened lines therebetween and staying with the cover panel.

3. A container according to claim2 ,wherein the corner segments are triangular in shape.

4. A container according to claim 3, wherein the corner segments are trapezoidal in shape.

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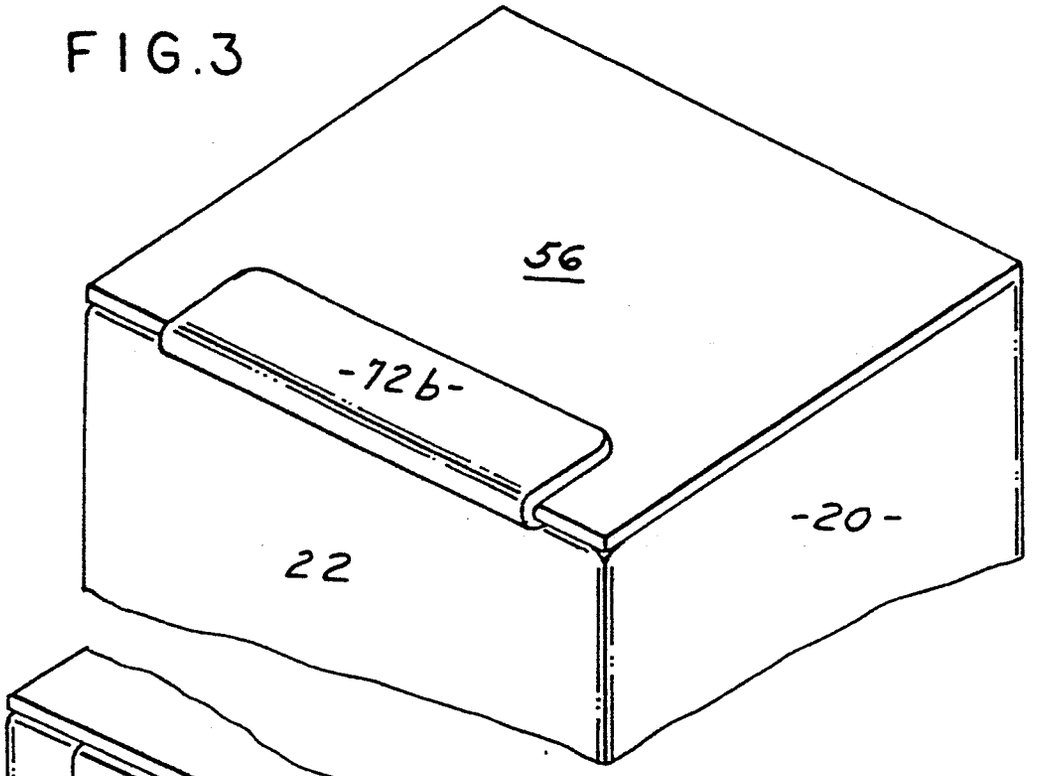
FIG.3



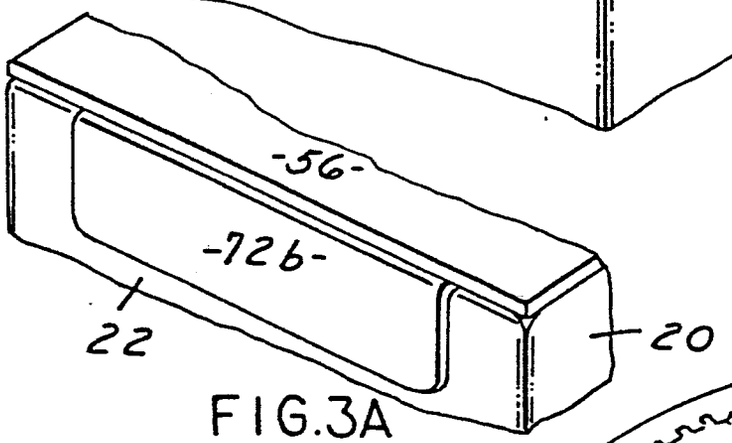


FIG.3A

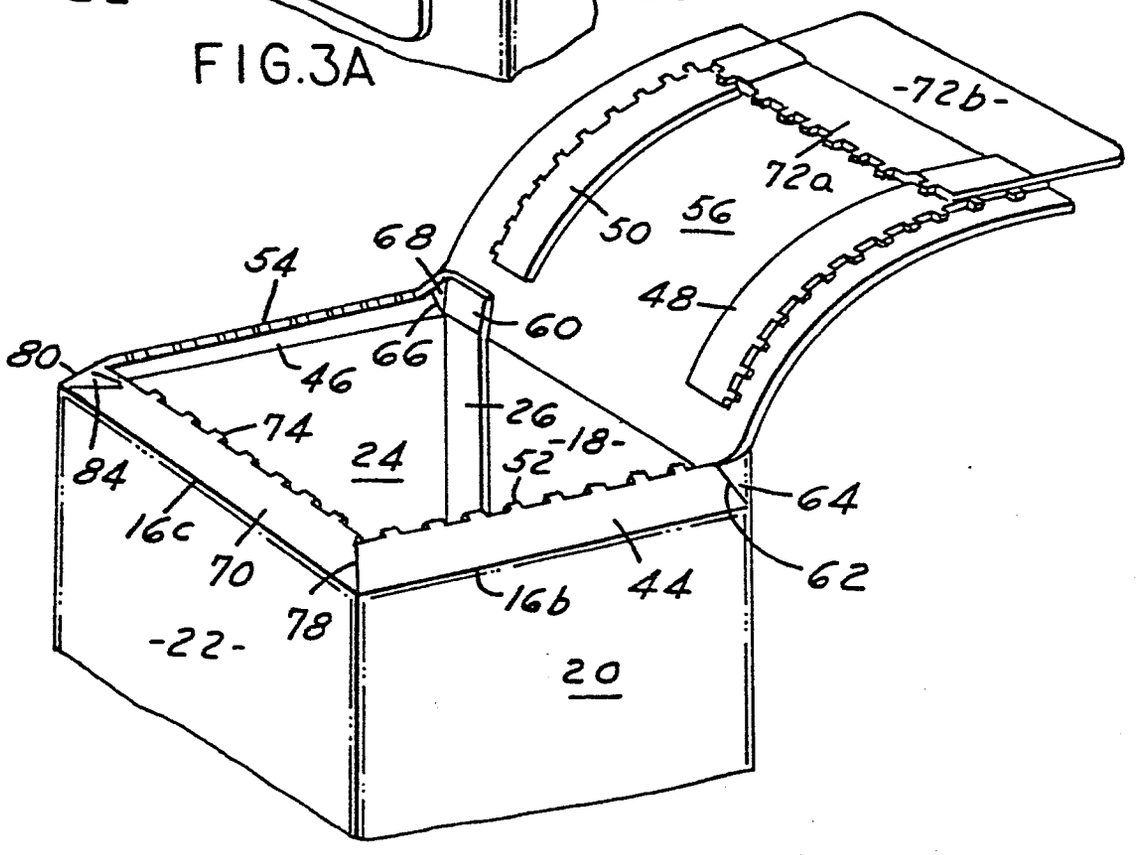


FIG.4

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FIG. 1

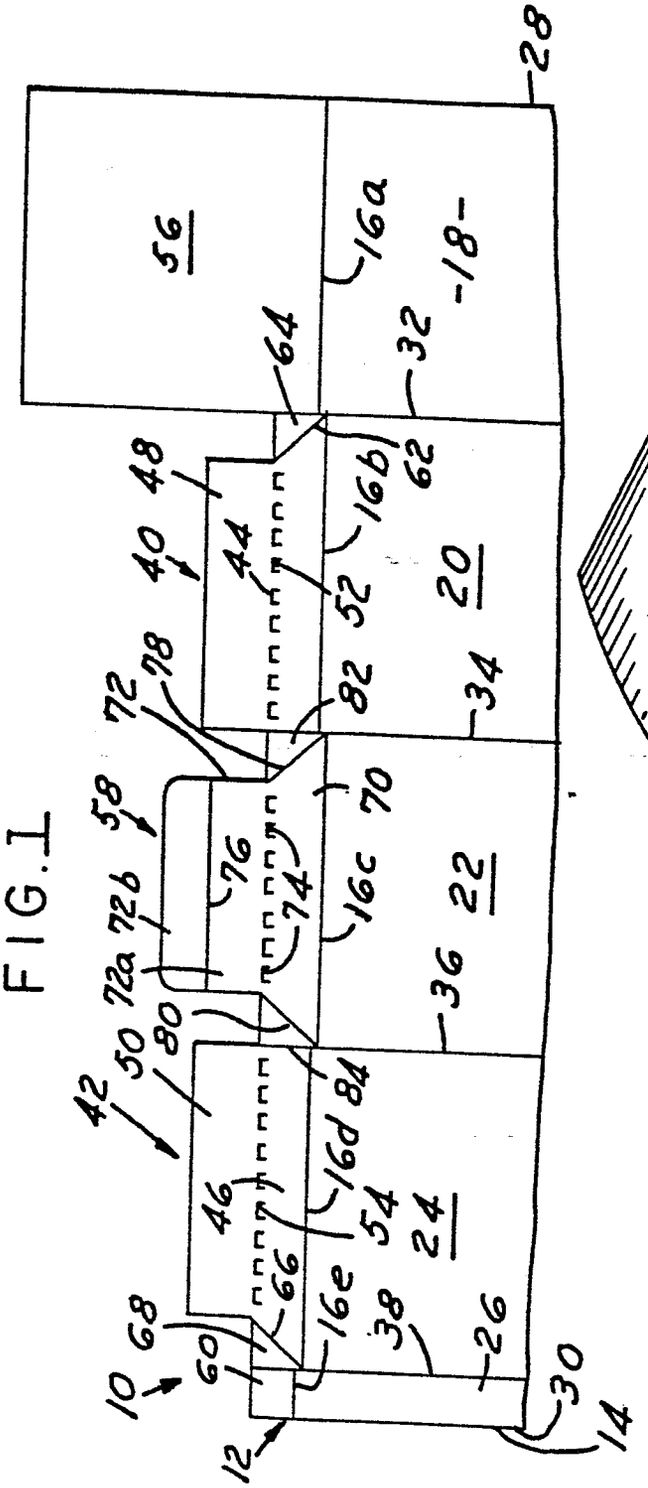

FIG. 2