



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

**EP 1 285 855 A2**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:

**26.02.2003 Bulletin 2003/09**

(51) Int Cl.7: **B65D 5/60**

(21) Application number: **02018805.8**

(22) Date of filing: **22.08.2002**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
IE IT LI LU MC NL PT SE SK TR**

Designated Extension States:

**AL LT LV MK RO SI**

(30) Priority: **22.08.2001 US 934822**

(71) Applicant: **Westvaco Packaging Group Inc.  
New York, New York 10171 (US)**

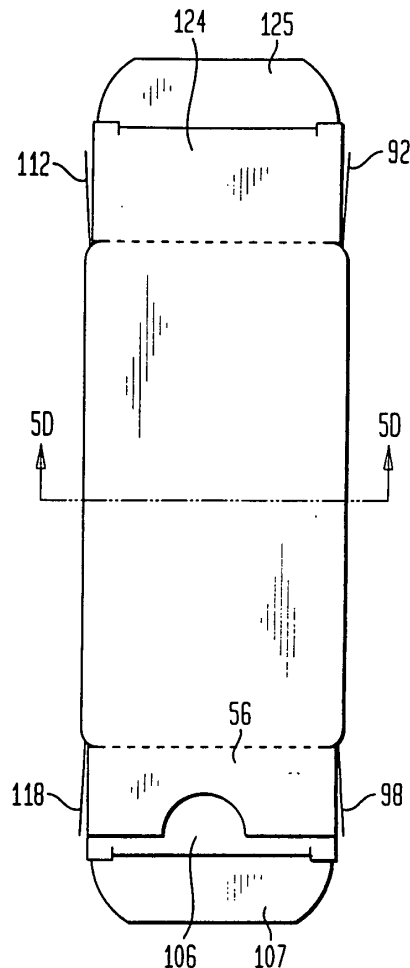
(72) Inventor: **Thibault, Richard C  
Pennsylvania 10171 (US)**

(74) Representative: **Hepworth, John Malcolm et al  
Hepworth Lawrence Bryer & Bizley  
Bloxam Court  
Corporation Street  
Rugby, Warwickshire CV21 2DU (GB)**

(54) **Two box container made of a composite blank and methods therefor**

(57) A container includes a first blank having fold lines and a series of substantially rectangular panels hingedly connected to one another at the fold lines of the first blank, and a second blank having fold lines and a series of substantially rectangular panels hingedly connected to one another at the fold lines of the second blank. The first and second blanks are adhered to one another to form a composite blank that is spirally foldable to form the double-walled container, whereby the first blank forms an inner box of the container and the second blank forms an outer box of the container that surrounds the inner box. The first blank forming the inner box may be made of a material that is different in composition and/or thickness than the material used to form the second blank forming the outer box. The first and second blanks may also be made of similar materials.

**FIG. 4D**



**EP 1 285 855 A2**

## Description

**[0001]** The present invention is generally related to containers, and is particularly related to containers including an inner box designed to protect an object packaged therein and an outer box that surrounds the inner box.

**[0002]** There have been many efforts directed to providing double-walled or two box containers. U.S. Patent 975,121 to *Carter* discloses a double-walled box formed of a single piece of sheet material having cooperating parts that are arranged to be folded and interlocked so as to provide two complete integrally joined boxes, one of the boxes being contained within and protected by the other box.

**[0003]** U.S. Patent 3,029,008 to *Membrino* discloses a composite container for shipping items including a flexible inner liner that is adhesively secured to an outer liner. The inner liner is typically a continuous tube that is cut and inserted within the outer liner, the tube being sealed using heat along a bottom portion thereof. The inner liner is typically a flexible plastic material, such as polyethylene, and the outer casing is typically fiberboard, cardboard or corrugated carton sheet material.

**[0004]** U.S. Patent 3,977,593 to *Rotman* discloses a carton capable of resisting collapse when stored with other cartons or handled carelessly. The carton is made from a unitary blank and has a double front wall and a double bottom wall. The double front wall is designed to resist compression under load and the double bottom wall provides a rigid bottom that resists distortion under load, and also assures that articles stored within the container will not fall through openings frequently present in conventional folded cartons.

**[0005]** U.S. Patent 4,388,999 to *Berry et al.* discloses a double-walled carton including a single blank comprising a series of hinged-together panels that are folded spirally to form a double-walled tube having spacers at all four corners of the carton to maintain a space between the corresponding inner and outer walls.

**[0006]** There are many problems associated with the prior art described above. First, the prior art teaches using a single blank for making both the inner and outer walls of a double walled container. Using a single blank, however may result in a container having an outer liner that is less aesthetically pleasing than desired. The prior art also requires relatively complex blank forming machine for making complex, unitary blanks foldable into two box containers. Thus, there is a need for a double-walled container whereby the outer layer may be made of a more aesthetically pleasing material than the material comprising the inner box. In addition, there is a need to provide blanks for the inner and outer boxes that may be made using less complex blank forming machines. There is also a need for containers that can change in reaction to the type of object being stored in the container. Moreover, there is a need to minimize the amount of material used and the cost associated with

preparing such materials.

**[0007]** Despite the advances in the prior art described above, there remains a need for a double-walled container made of a composite blank that is foldable to form a complete inner box surrounded by a complete outer box.

**[0008]** The present invention is directed to forming a container including an inner box surrounded and protected by an outer box. The container is preferably used for packaging objects therein, such as fragile goods, cosmetic fragrances or glass containers that may be damaged during packaging and shipment. The present invention also minimizes the amount of labor required to form prior art double-walled containers, whereby the inner box is typically formed separately from the outer box. Such prior art methods are extremely labor intensive and cost inefficient.

**[0009]** In certain preferred embodiments of the present invention, a container includes a first blank having fold lines and a series of substantially rectangular panels that are hingedly connected to one another at the fold lines of the first blank, and a second blank including fold lines and a series of substantially rectangular panels that are hingedly connected to one another at the fold lines of the second blank. The first and second blanks are preferably adhered to one another to form a composite blank that may be spirally folded so as to form the container, wherein the first blank forms an inner box of the container and the second blank forms an outer box of the container that surrounds and protects the inner box.

**[0010]** In certain preferred embodiments, the first and second blanks are made of a substantially similar material having a similar gauge thickness. In other embodiments, however, the first blank preferably comprises a first material and the second blank comprises a second material that is different in composition and/or thickness than the first material. In some of these preferred embodiments, the first blank is made of a first material that is sturdier than the material comprising the second blank. Preferred first blank materials include corrugated board, corrugated plastic and styrofoam. Preferred corrugated board materials for the first blank may be selected from the group consisting of B,C,E and F flute corrugated board. The second blank forming the outer box of the container is preferably made of paperboard, PVC, PET G, A PET, R PET, polypropylene and assorted plastic materials.

**[0011]** The substantially rectangular panels of the first blank preferably comprise in series a first sidewall, a rear wall, a second sidewall adapted to oppose the first sidewall, and a front wall adapted to oppose the rear wall. The first panel may also include one or more tabs hingedly connected to upper or lower ends of the first and second sidewalls or the front and rear walls of the first blank. In one particular preferred embodiment, the first and second sidewalls of the first blank include tabs hingedly connected to upper ends thereof and a bottom

tab hingedly connected to a lower end of the front wall.

**[0012]** The substantially rectangular panels of the second blank preferably include in series a front wall, a first sidewall, a rear wall and a second sidewall. The second blank may also preferably include an attachment flange hingedly connected to an outer edge of the front wall of the second blank. The attachment flange is preferably adapted to be adhered to an inner surface of the second sidewall of the second blank when the container is assembled. After the attachment flange and the second sidewall have been adhered together, the two components preferably work in unison to provide a second sidewall for the outer box of the container, as will be described in more detail below.

**[0013]** In preferred embodiments, the second sidewall of the first blank is adhered to the attachment flange of the second blank to form a composite blank, whereby the front wall of the first blank is juxtaposed with and overlies the front wall of the second blank. The first blank desirably includes at least one upper end tab hingedly connected to an upper end of one of the first and second sidewalls for selectively closing an upper end of the inner box. In particular preferred embodiments, the first blank includes a first upper tab hingedly connected to the upper end of the first sidewall and a second upper end tab hingedly connected to the upper end of the second sidewall. When the container is assembled for receiving an object, the first and second upper end tabs preferably oppose one another. After an object has been placed in the container, the tabs are forced toward one another for closing an upper end of the inner box. The first blank may also preferably include one lower end tab hingedly connected to a lower end of one of the front and rear walls for selectively closing a lower end of the inner box. The lower end tab is preferably forced into its closed position before the object being packaged is placed in the inner box.

The second blank desirably includes at least one top closure hingedly connected to an upper end thereof for selectively closing an opening at an upper end of the container and at least one bottom closure hingedly connected to the lower end thereof for selectively closing an opening at a lower end of the container. The top and bottom closures may include tongues having curved outer edges that are designed to fit between the inner and outer boxes after the container has been fully assembled.

**[0014]** Other preferred embodiments of the present invention preferably include a container including a first blank made of a first material, the first blank including fold lines and a series of substantially rectangular panels hingedly connected to one another at the fold lines of the first blank. The container also desirably includes a second blank made of a second material that is different than the first material, the second blank including fold lines and a series of substantially rectangular panels hingedly connected to one another at the fold lines of the second blank. The first and second blanks are

desirably adhered to one another to form a composite blank that is spirally foldable to form the container. After the composite blank has been spirally folded, the first blank desirably forms an inner box of the container and the second blank desirably forms an outer box of the container that surrounds the inner box. The first blank desirably includes one or more tabs hingedly connected to upper and/or lower ends thereof for selectively covering the upper end and lower end openings of the inner box. The second blank desirably includes closures hingedly connected to upper and lower ends thereof for selectively closing upper and lower end openings of the outer box. When the closures are in their closed position, the closures of the second blank preferably cover the tabs of the first blank.

**[0015]** These and other preferred embodiments of the present invention will be described in more detail below.

FIG. 1 shows a plan view of an inside surface of a first blank for a container, in accordance with certain preferred embodiments of the present invention.

FIG. 2 shows a plan view of an inside surface of a second blank for a container, in accordance with certain preferred embodiments of the present invention.

FIG. 3 shows a plan view of the first and second blanks of FIGS. 1 and 2 adhered to one another to form a composite blank, in accordance with certain preferred embodiments of the present invention.

FIGS. 4A-4D show a method for assembling the composite blank of FIG. 1 into a container including an inner box and an outer box, in accordance with certain preferred embodiments of the present invention.

FIG. 5A shows a cross sectional view of FIG. 4C taken along line Va-Va thereof.

FIGS. 5B and 5C show a method of configuring the container of FIG. 5A into a double walled container suitable for receiving an object package therein, in accordance with certain preferred embodiments of the present invention.

FIG. 5D shows a cross sectional view of 4D taken along line 5D-5D thereof.

**[0016]** Referring to FIGS. 1-3, a double-walled container includes a first blank 10, shown in FIG. 1, which is attached to a second blank 70, shown in FIG. 2, to form a composite blank 130, shown in FIG. 3. Referring to FIG. 1, first blank 10 includes a series of fold lines 12, 14 and 16 that are preferably substantially parallel to one another for dividing first blank 10 into a series of substantially rectangular panels 18, 20, 22 and 24. The

substantially rectangular panels are hingedly connected to one another at respective fold lines 12, 14 and 16. In the particular preferred embodiment shown in FIG. 1, the rectangular panels include a first sidewall 18 that is hingedly connected to a rear wall 20 at fold line 12. Rear wall 20, in turn, is hingedly connected with second sidewall 22 at fold line 14, and second sidewall 22 is hingedly connected with front wall 24 at fold line 16.

**[0017]** In preferred embodiments, first sidewall 18 includes upper end 26 having an upper end tab 28 hingedly connected thereto along fold line 30 and lower end 32 remote therefrom. An outer edge 34 of first sidewall 18 includes an elongated projection 36. Rear wall 20 has an upper end 38 and a lower end 40 remote therefrom. Second sidewall 22 has an upper end 42 hingedly connected to a second upper end tab 44 at fold line 46 and lower end 48 remote therefrom. Upper and lower cut-outs 50A, 50B may be provided between rear wall 20 and second sidewall 22 in order to facilitate folding of first blank 10 and assembly of a double-walled container, as will be described in more detail below.

**[0018]** Front wall 24 of first blank 10 includes upper end 52 and lower end 54 having lower end tab 56 hingedly connected thereto along fold line 58. Fold line 58 may include a scored portion 60 whereby a cut line passes intermittently through front wall 24, as well as an elongated cut line 62 that passes completely through front wall 24 for an extended length. Although the present invention is not limited by any particular theory of operation, it is believed that providing the elongated cut line 62 facilitates bending of lower end tab 56 during an assembly operation. Absence of an elongated cut line would generally increase the amount of force required to fold the lower end tab 56. An outer edge 64 of front wall 24 includes an elongated slot 66 that preferably mates with projection 36 of first sidewall 18 when first blank 10 is folded to form a container.

**[0019]** Referring to FIG. 2, second blank 70 includes a series of fold lines 72, 74, 76 and 78 that are preferably substantially parallel to one another. The fold lines of second blank 70 divide second blank into attachment flange 80, front wall 82, first sidewall 84, rear wall 86 and second sidewall 88. As will be described in more detail below, when the double-walled container is fully assembled, the second sidewall 88 is preferably adhered to flange 80 for securing second blank 70 in a tubular configuration. Second sidewall 88 desirably includes an upper end 90 having flap 92 hingedly connected thereto along fold line 94 and lower end 96 having flap 98 hingedly connected thereto along fold line 100. Rear wall 86 preferably includes upper end 102 and lower end 104 including closure 106 hingedly connected to lower end 104 along fold line 108.

**[0020]** Second blank 70 also includes first sidewall 84 having upper end 110 including upper end flap 112 hingedly connected thereto along fold line 114 and lower end 116 including lower end flap 118 hingedly connected thereto along fold line 120. Front wall 82 desirably in-

cludes upper end 122 having closure 124 hingedly connected thereto along fold line 126 and lower end 128 remote therefrom.

**[0021]** Attachment flange 80 is hingedly connected to front wall 82 along fold line 72, which in turn, is hingedly connected to first sidewall 84 along fold line 74, which in turn, is hingedly connected to rear wall 86 along fold line 76, which in turn, is hingedly connected to second sidewall 88 along fold line 78.

**[0022]** In certain preferred embodiments, the first and second blanks may comprise similar materials. In other preferred embodiments, however, the first blank 10 may be made of a material that is different to the material comprising the second blank 70. In particular preferred embodiments, first blank 10 comprises a material that is thicker than the material of second blank 70. In these embodiments, the first blank may comprise B,C,E and/or F flute corrugated board, PVC corrugated plastic or styrofoam. The second blank 70 may be made of paperboard having a gauge different to that of the first blank. The second blank may also be made of PVC, PET G, A PET or R PET. The two blanks 10, 70 are preferably aligned and glued together to form the composite blank 130 (FIG. 3) using a machine such as that disclosed in U.S. Patent 4,549,878, the disclosure of which is hereby incorporated by reference herein. The machine that assembles the two blanks 10, 70 may also fold the composite blank and apply glue where necessary to form a flattened container including the first blank 10 comprising an inner box and the second blank 70 comprising the outer box. The flat container may then be shipped to a packaging plant where the container is expanded into a shape suitable for having an object packaged therein.

**[0023]** Referring to FIGS. 1-3, first blank 10 and second blank 70 are preferably adhered to one another, such as by using adhesive (not shown), to form a composite blank 130 that may be assembled to form a container. In one particular embodiment, an adhesive is preferably provided between attachment flange 80 and second sidewall 22 of first blank 10 for adhering flange 80 and second sidewall 22 together which, in turn, adheres first and second blanks 10, 70 together. During this assembly step, the fold lines of the respective first and second blanks 10, 70 as preferably positioned in substantially parallel alignment with one another. After attachment flange 80 and second sidewall 22 have been attached together, the front wall 24 of first blank 10 preferably overlies the front wall 82 of second blank 70.

**[0024]** A spiral folding process of the adhered first and second blanks is hereinafter described, and is best illustrated sequentially by figures 3 to 4D of the accompanying drawings.

**[0025]** Referring to FIGS. 3 and 4, first blank 10 is then folded along fold line 14 so that rear wall 20 and first sidewall 18 of first blank 10 overlie front wall 24 of first blank 10 and front wall 82 of second blank 70.

**[0026]** Referring to FIGS. 4A and 4B, the second

blank is then preferably folded along fold line 74 so that the front wall 82 of second blank 70 overlies rear wall 86 of second blank 70.

[0027] Referring to FIGS. 4B and 4C, an adhesive material, such as glue, is preferably placed atop an outer face of attachment flange 80 or second sidewall 88 of second blank 70 is folded along fold line 78 for adhering second sidewall 88 to attachment flange 80. In the particular embodiment shown in FIG. 4C, the assembly is preferably maintained substantially flat and includes the first blank forming an inner box which is surrounded by second blank 70 forming an outer box of a container. The joined together second sidewall 88 and attachment flange 80 of second blank 70 are hereinafter referred to as the second sidewall of outer box.

[0028] The container shown in FIGS. 4C and 5A is preferably shipped in a flat condition to a packaging plant wherein objects, such as bottles, may be packed into the containers. Referring to FIGS. 4A-5D, the container is then expanded into a three-dimensional configuration suitable for receiving an object packed therein. In FIG. 5A, the container is substantially flat, with front wall 82 and second sidewall 88 of second blank 70 overlying rear wall 86 and first side 84 of second blank 70. Referring to FIG. 5B, first blank 10 forming an inner box and second blank 70 forming an outer box of the container are subjected to external forces so that the respective front walls 24 and 82 of the first and second blanks move away from the opposing rear walls 20 and 86 of the first and second blanks. Simultaneously, first and second sidewalls of the inner and outer boxes swing about pivot points at lower ends thereof relative to rear walls 20, 86. Referring to FIG. 5C, the first and second sidewalls continue to move in a direction indicated by the arrows until the container is arranged in the expanded configuration shown in FIG 5D. As shown in FIG. 5D, first blank 10 forms an inner box 140 that is surrounded by second blank 70 that forms an outer box 150 surrounding inner box 140. The container includes adhesive 160 securing second sidewall 88 to flange 80.

[0029] Referring to FIG. 4D, after the container has been opened to the expanded configuration shown in FIG. 5D, an object may be placed inside the container. Although the present invention is not limited by any particular theory of operation, it is believed that providing a container including an inner box surrounded by an outer box will better protect an object stored within the container.

[0030] In order to place an object within the container of FIG. 4D, the tab enclosures at the upper and lower ends of the container may be closed either manually or automatically using a packing machine. In one preferred embodiment, a packing machine selectively engages the tab enclosures at the upper and lower ends of the container in a systematic fashion in order to secure an object therein. In one preferred embodiment, a force is applied to lower end tab 56 for folding lower end tab along its fold line (not shown) so as to partially cover an

opening at a lower end of the container. The opposing lower end flaps 98, 118 are then forced towards one another so as to cover lower end tab 56 and further enclose the lower end of the container. The lower end closure 106 is then folded so that tongue 107 is preferably secured between the front walls of the first and second blanks (not shown). Once the lower end closure 106 has been secured in place so as to effectively close the lower end of the container, an object, such as a bottle, may be placed through an opening at the upper end of the container. The lower end tab 56 and opposing lower end flaps 98, 118 preferably abut against and/or support a lower end of the packaged object. The opening at the upper end of the container is then preferably closed by first forcing the opposing upper end flaps 92, 112 toward one another so as to cover the upper end opening. Although not shown in FIG. 4D, preferred embodiments of the present invention may also include opposing upper end tabs 28, 44 hingedly connected to first blank 10, the upper end tabs 28, 44 being movable toward one another to selectively cover the opening at the upper end of the container. The upper end closure 124 is then folded whereby tongue 125 is secured in place between the rear walls 20, 86 of the respective first and second blanks.

[0031] Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. For example, the number, size and shape of the panels may be readily modified depending upon the size and shape of an object being packed in the container. Moreover, the number of tabs and closures and the location of the tabs and closures may be modified. The materials used to form the first and second blanks may also be changed to enhance the durability, strength, aesthetic appearance, or any other quality of the container. Thus, it is understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the appended claims.

## Claims

### 1. A container comprising:

a first blank having a series of panels hingedly connected to one another, a second blank having a series of panels hingedly connected to one another; said first and second blanks being adhered to one another to form a composite blank that is spirally foldable to form said container.

### 2. A container comprising:

a first blank including fold lines and a series of substantially rectangular panels hingedly connected to one another at the fold lines of said first blank;

a second blank including fold lines and a series of substantially rectangular panels hingedly connected to one another at the fold lines of said second blank;

said first and second blanks being adhered to one another to form a composite blank that is spirally foldable to form said container, wherein said first blank forms an inner box of said container and said second blank forms an outer box of said container that surrounds said inner box.

3. The container as claimed in claim 1 or claim 2, wherein said first blank comprises a first material and said second blank comprises a second material that is different than said first material.
4. The container as claimed in any of claims 1 to 3, wherein the first material of said first blank is sturdier than the second material of said second blank.
5. The container as claimed in any of claims 1 to 4, wherein said first blank comprises a material selected from the group consisting of corrugated board, corrugated plastic and Styrofoam.
6. The container as claimed in claim 5, wherein said corrugated board comprises a material selected from the group consisting of B, C, E and F flute corrugated board.
7. The container as claimed in any of claims 1 to 6, wherein said inner box forms a protective liner for an object disposed within said container.
8. The container as claimed in any preceding claim, wherein said second blank comprises paperboard.
9. The container as claimed in any of claims 1 to 7, wherein said second blank comprises a material selected from the group consisting of PVC, PET G, A PET, R PET, polypropylene and assorted plastic materials.
10. The container as claimed in any preceding claim, wherein the substantially rectangular panels of said first blank comprise in series a first sidewall, a rear wall, a second sidewall adapted to oppose the first sidewall and a front wall adapted to oppose the rear wall, and wherein the substantially rectangular panels of said second blank comprise in series an attachment flange, a front wall, a first sidewall, a rear wall adapted to oppose the front wall, and a second sidewall adapted to oppose the first sidewall.

11. The container as claimed in claim 10, wherein the second sidewall of said first blank is adhered to the attachment flange of said second blank so that the front wall of said first blank is juxtaposed with the front wall of said second blank.

12. The container as claimed in claim 10 or claim 11, wherein said first blank includes at least one upper end tab hingedly connected to an upper end of one of said first and second sidewalls for selectively closing an upper end of said inner box.

13. The container as claimed in claim 10 or claim 11, wherein said first blank includes a first upper end tab hingedly connected to the upper end of said first sidewall and a second upper end tab hingedly connected to the upper end of said second sidewall.

14. The container as claimed in any of claims 9 to 13, wherein said first blank includes at least one lower end tab hingedly connected to a lower end of one of said front and rear walls for selectively closing a lower end of said inner box.

15. The container as claimed in claim 14, wherein said first blank includes at least one lower end tab hingedly connected to the lower end of said front wall.

16. The container as claimed in any of claims 1 to 11, wherein said second blank includes at least one top closure hingedly connected to an upper end thereof for selectively closing an opening at an upper end of said container and at least one bottom closure hingedly connected to a lower end thereof for selectively closing an opening at a lower end of said container.

17. The container as claimed in any of claims 1 to 9, wherein the substantially rectangular panels of said first blank comprise in series a first sidewall, a rear wall, a second sidewall adapted to oppose the first sidewall and a front wall adapted to oppose the rear wall, and wherein the substantially rectangular panels of said second blank comprise in series a first sidewall, a front wall, a second sidewall adapted to oppose the first sidewall and a rear wall adapted to oppose the front wall.

18. The container as claimed in claim 17, wherein said first blank includes tabs hingedly connected to upper and lower ends thereof for selectively covering upper and lower ends of said inner box; and wherein said second blank includes closures hingedly connected to upper and lower ends thereof for selectively closing upper and lower ends of said outer box.

19. The container as claimed in claim 18, wherein said closures of said second blank cover said tabs of said first blank when said closures selectively close the upper and lower ends of said container.

5

20. The container as claimed in any preceding claim, wherein said first blank comprises a material made of a first gauge and said second blank comprises a material made of a second gauge, wherein the first gauge is grater than the second gauge.

10

21. A first blank and a second blank for forming a container as claimed in any preceding claim.

15

20

25

30

35

40

45

50

55

FIG. 1

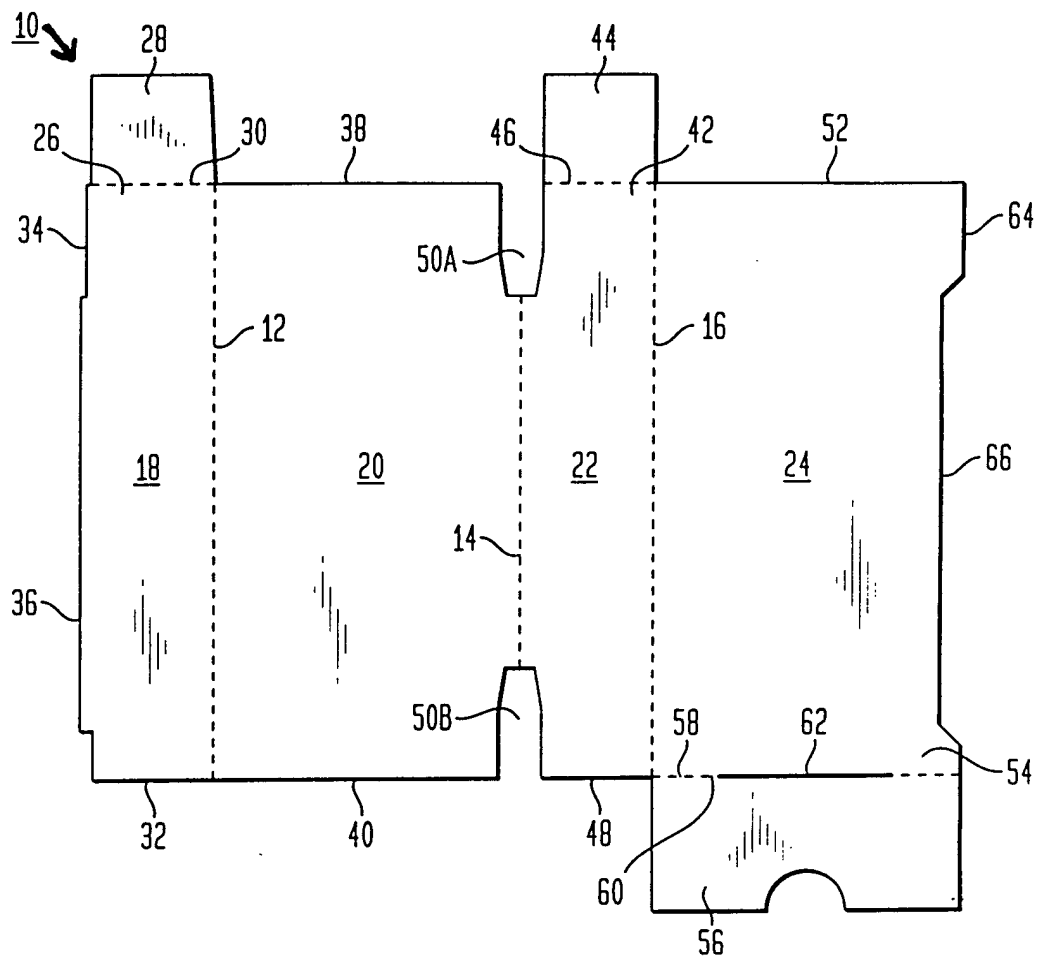




FIG. 2

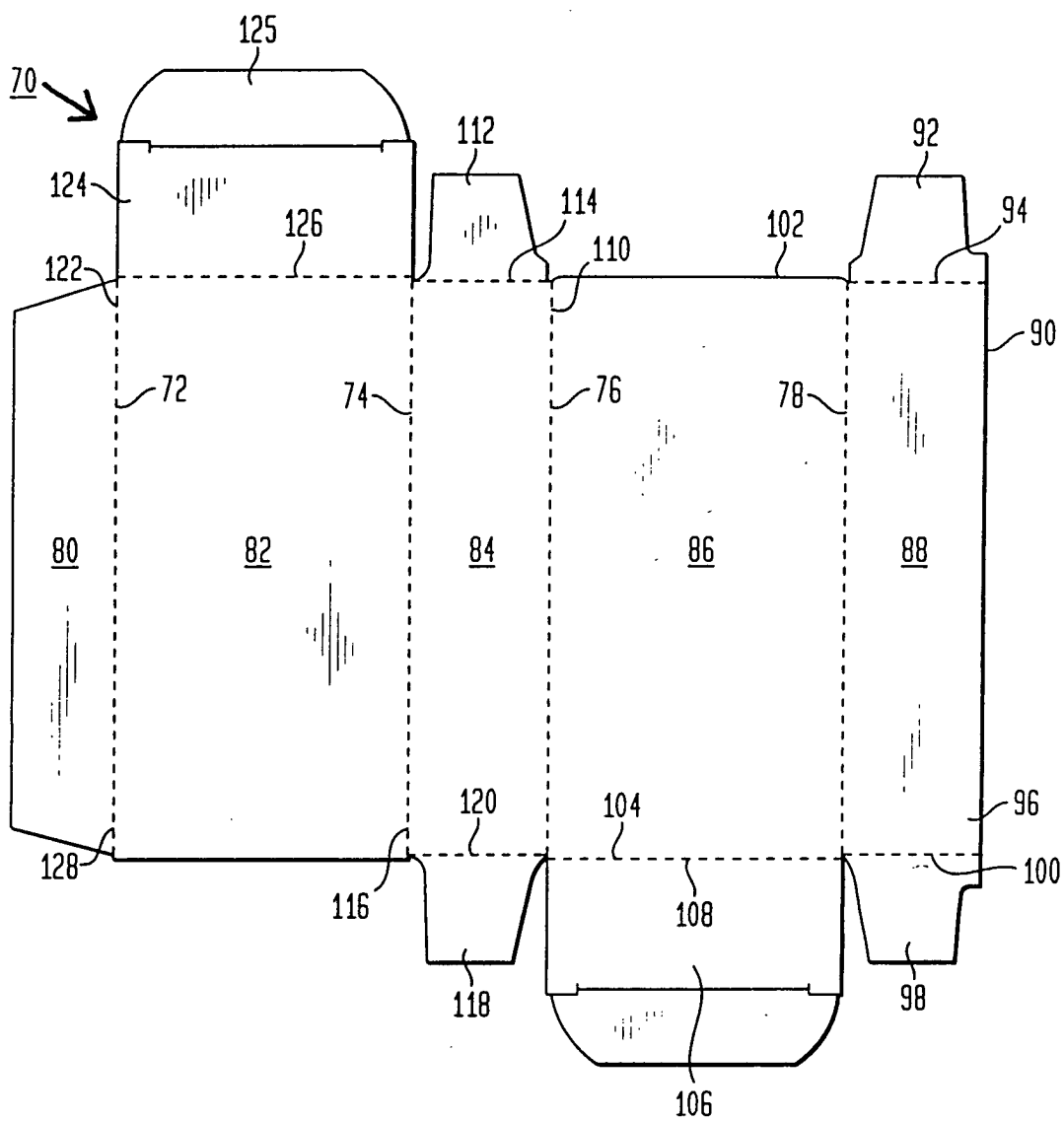


FIG. 3

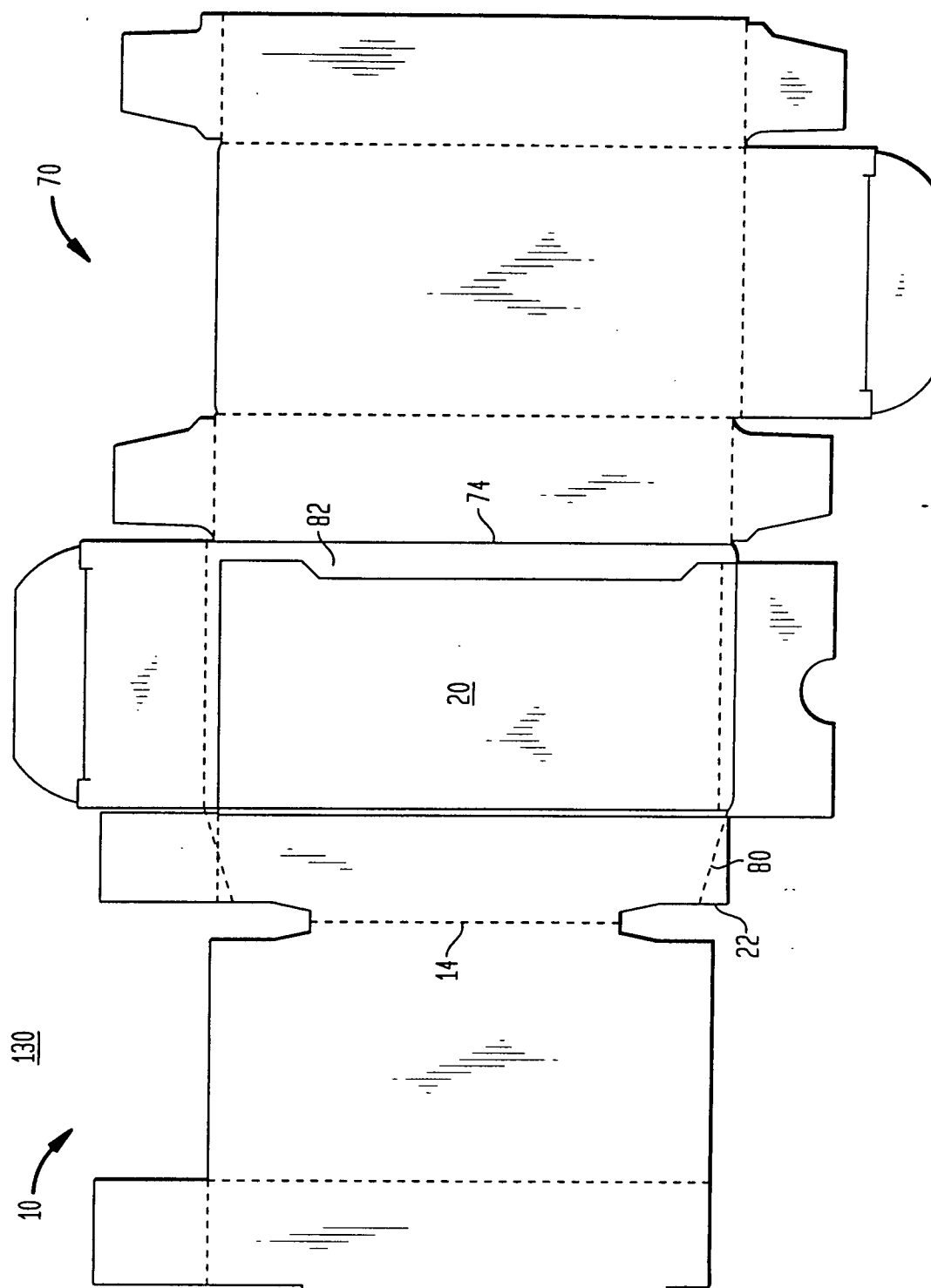
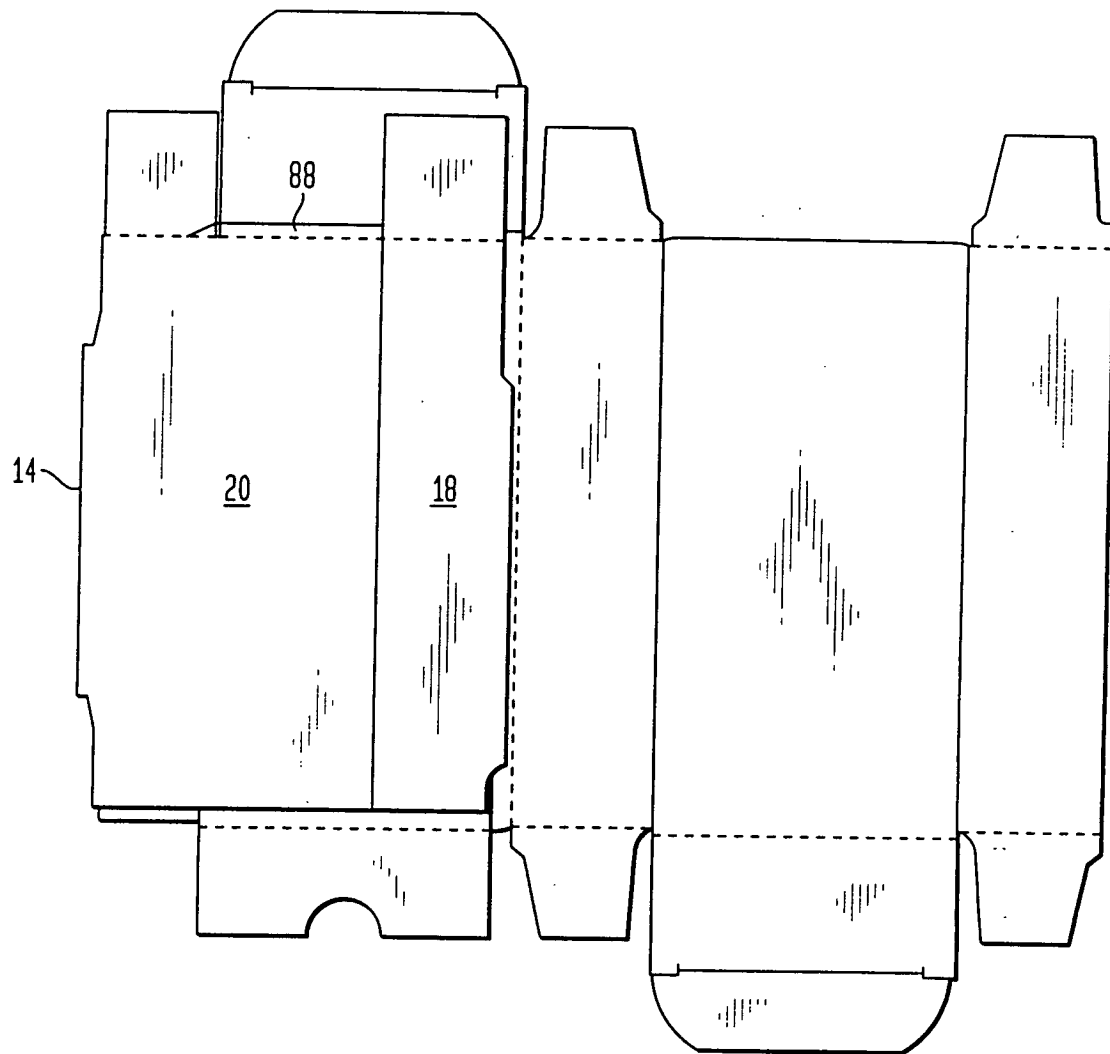


FIG. 4A



*FIG. 4B*

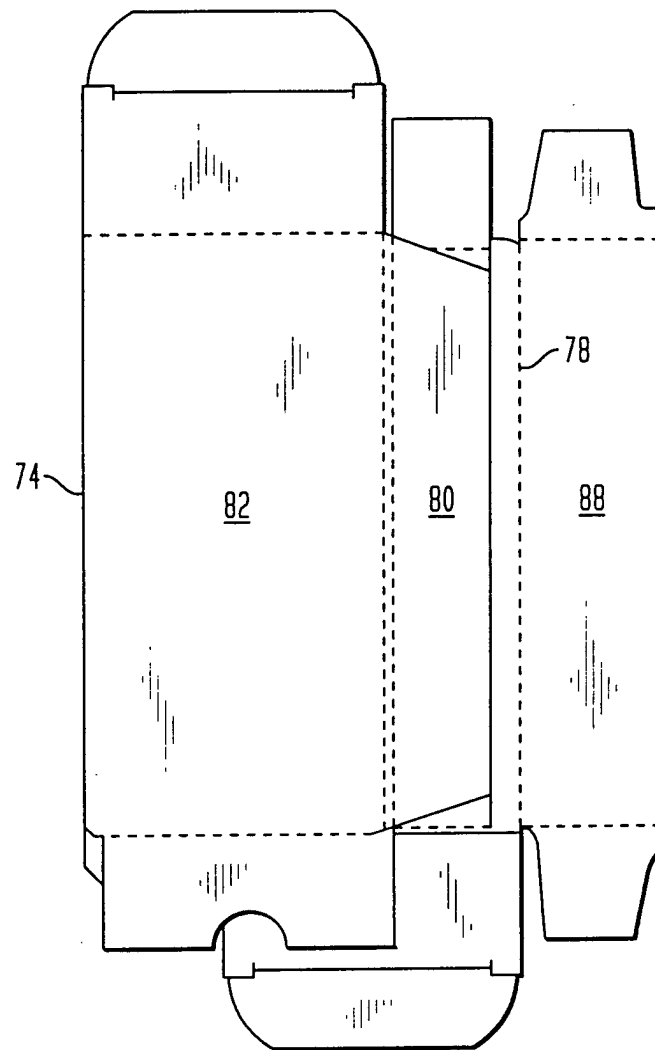


FIG. 4C

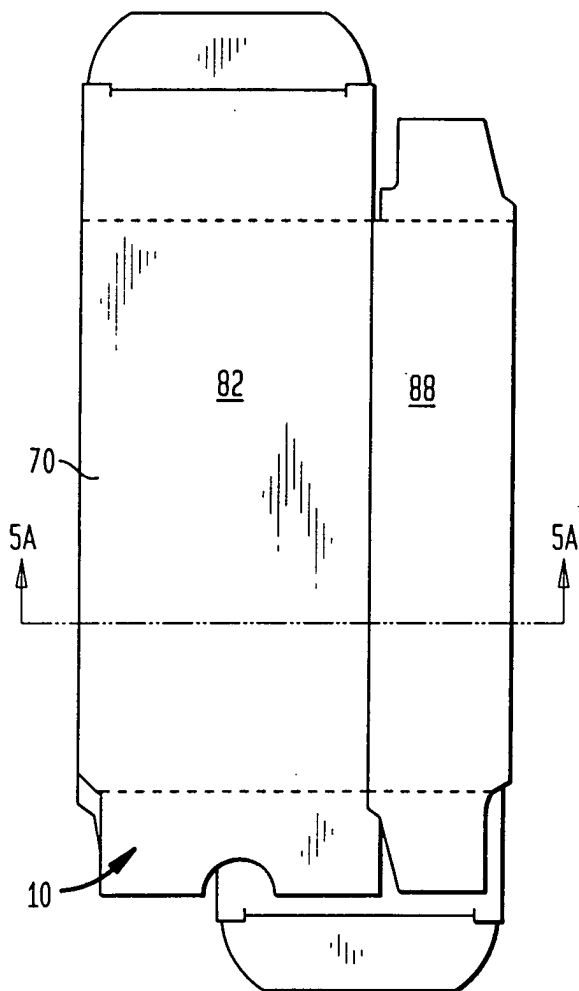


FIG. 4D

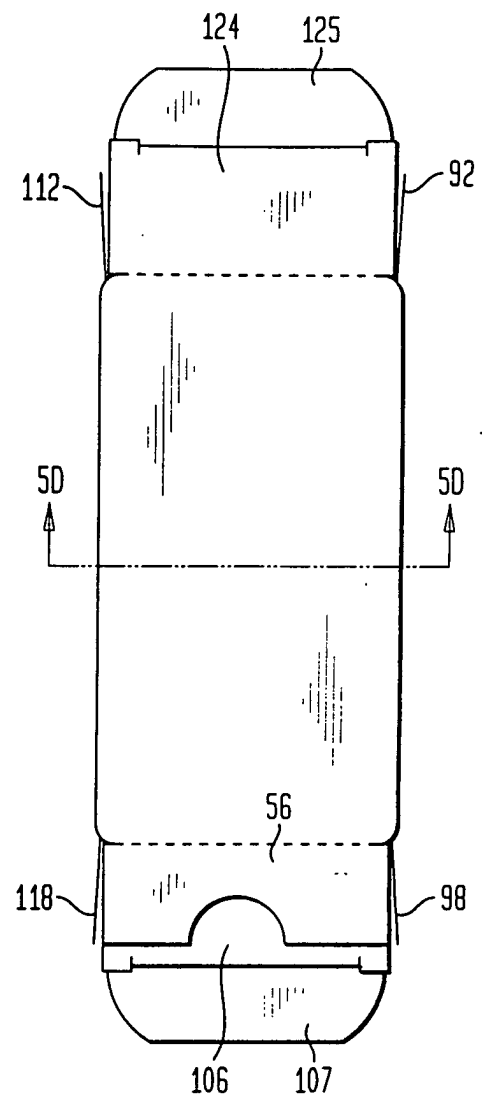


FIG. 5A

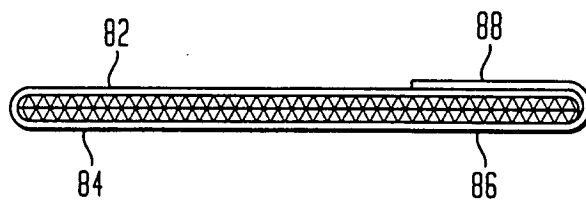


FIG. 5B

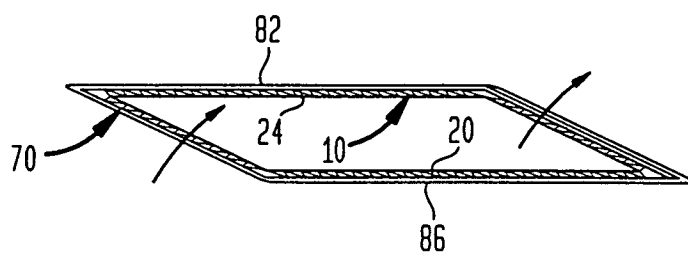


FIG. 5C

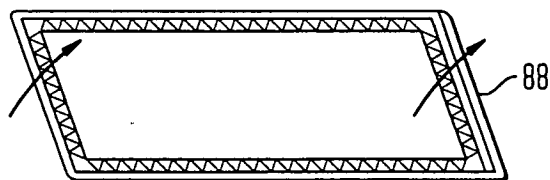


FIG. 5D

