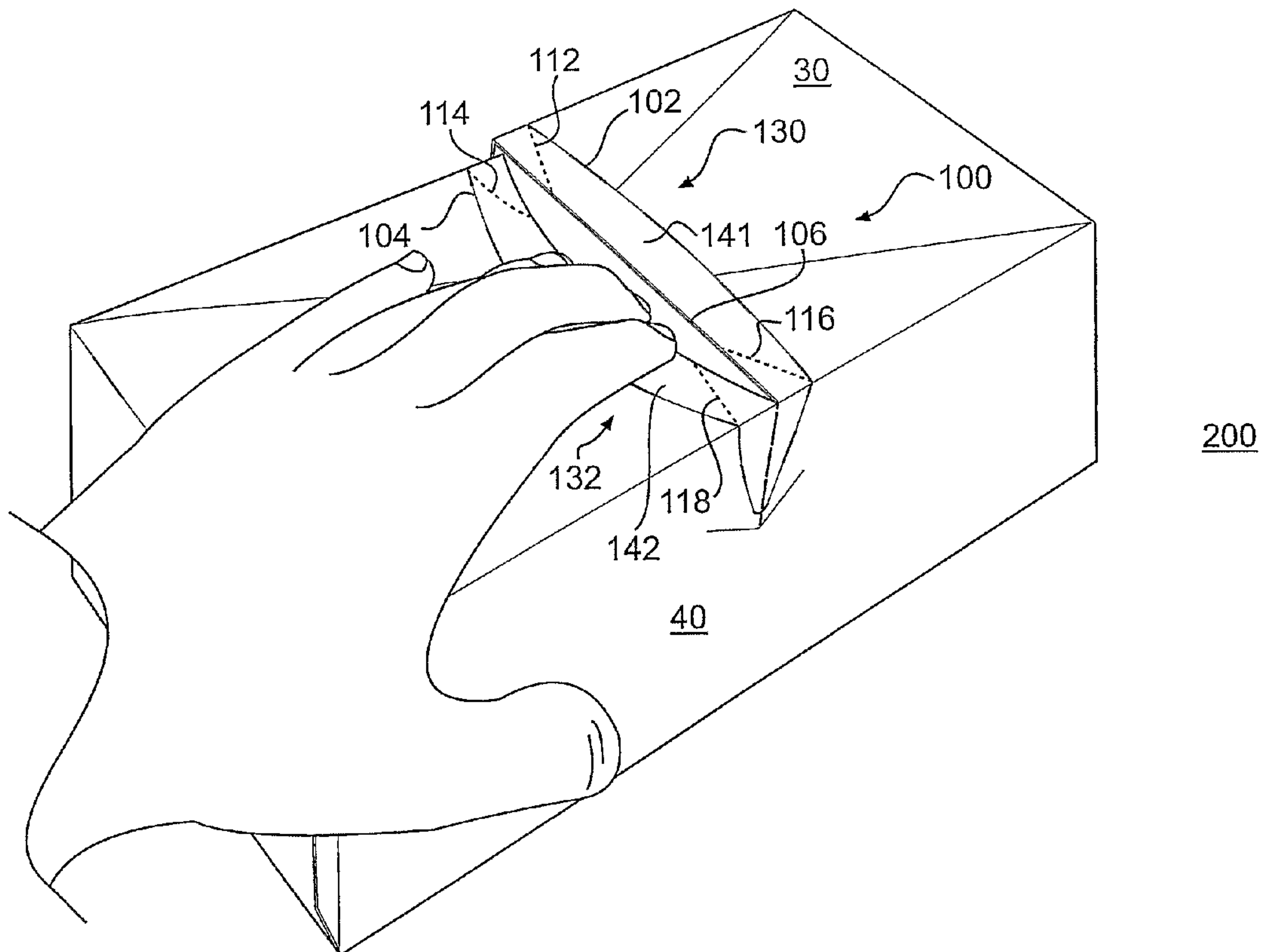




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(54) Titre : BOITE EN CARTON AVEC POIGNEE A SOUFFLETS
(54) Title: CARTON WITH GUSSETED HANDLE



(57) Abrégé/Abstract:

A carton has a handle having gussets that provide cushioning for a user's hand during carrying of the carton. The handle also provides additional strength, rigidity and tear resistance to the carton.



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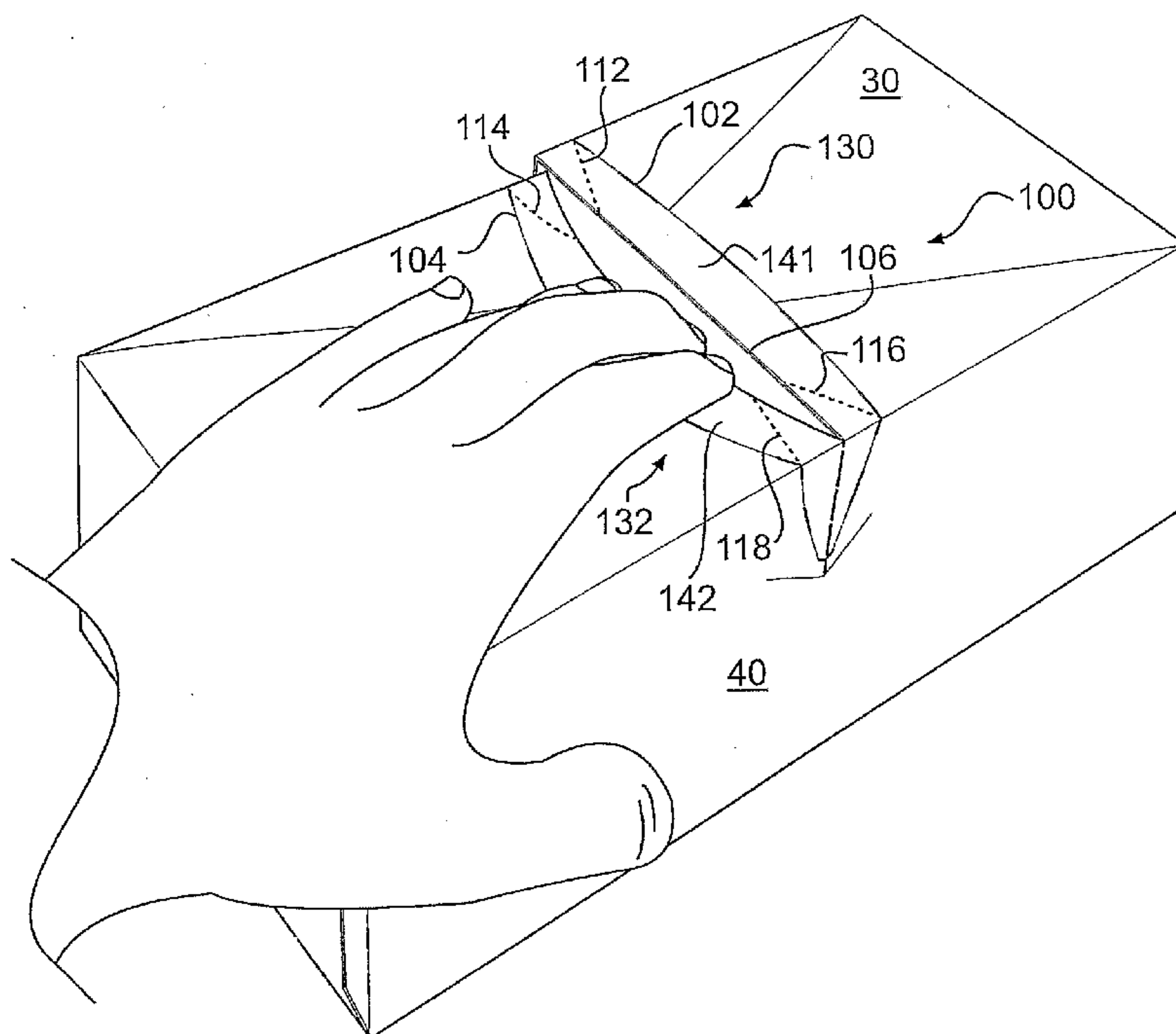
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(54) Title: CARTON WITH GUSSETED HANDLE



(57) Abstract: A carton has a handle having gussets that provide cushioning for a user's hand during carrying of the carton. The handle also provides additional strength, rigidity and tear resistance to the carton.

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CARTON WITH GUSSETED HANDLE

BACKGROUND

[0001] Handle designs for cartons are well known in the art. Conventional handle designs, however, often suffer from many disadvantages. For example, conventional handle designs may fail during lifting of the carton due to lack of strength. Lifting may also cause conventional cartons to bow or to tear at or around the tear lines forming the handle.

SUMMARY

[0002] According to a first embodiment of the invention, a carton comprises a handle having first and second gussets defined by an opening line and exterior lines that extend through multiple carton panels. Tear stops are spaced from ends of the exterior lines. The gussets can be accessed at the opening line and folded into the interior of the carton during use. The exterior lines can have inwardly concave, arcuate profiles.

[0003] According to one aspect of the present invention, the handle provides strength to the carton by the arrangement and shape of the handle lines. The handle also allows for flexure of the upper handle surface while reducing the likelihood of tearing or excessive bowing, etc. The handle additionally allows the top or upper panel to flex outward or upward slightly while maintaining the adjacent side panels in a substantially unbowed position. This flexure enables the carton to maintain contact and/or support for articles disposed in the carton.

[0004] According to one aspect of the present invention there is provided a blank for erecting into a carton, the blank comprising a first panel; a second panel foldably connected to the first panel; a third panel foldably connected to the second panel at a first fold line; a fourth panel foldably connected to the third panel at a second fold line; at least one first end flap extending along a first marginal area of the blank; at least one second end flap extending along a second marginal area of the blank; and a handle having a first gusset, a second gusset, a first tear stop and a second tear stop, wherein the handle is defined at least in part by a first arcuate concave exterior line, a second arcuate concave exterior line, and an opening line extending between the first and second exterior lines, each of the first arcuate concave exterior line, the second

arcuate concave exterior line, and the opening line extends at least partially across each of the second panel, the third panel, and the fourth panel, the opening line comprising a tear line that terminates at a first end of the first and second exterior lines in the second panel and a second end of the first and second exterior lines in the fourth panel, the first gusset being at least partially defined by the first arcuate concave exterior line and the opening line, and the second gusset being at least partially defined by the second arcuate concave exterior line and the opening line, the first gusset comprises a first central panel in the third panel, a first edge panel foldably connected to the first central panel and comprising at least a portion of the second panel and the third panel, and a second edge panel foldably connected to the first central panel and comprising at least a portion of the third panel and the fourth panel, the second gusset comprises a second central panel in the third panel, a third edge panel foldably connected to the second central panel and comprising at least a portion of the second panel and the third panel, and a fourth edge panel foldably connected to the second central panel and comprising at least a portion of the third panel and the fourth panel, the first tear stop is spaced from the first end of the first and second exterior lines in the second panel, the carton comprising a space of material being free from any form of weakening between the first tear stop and the first end of the first and second exterior lines, and the second tear stop is spaced from the second end of the first and second exterior lines in the fourth panel, the carton comprising a space of material being free from any form of weakening between the second tear stop and the second end of the first and second exterior lines; each of the first and second tear stops comprises at least two cut lines forming a V shape extending from a vertex in the respective second or fourth panel to respective ends in the second or fourth panel, the ends of the two cut lines being spaced apart from a respective first or second fold line.

[0004.1] According to a further aspect of the present invention there is provided a blank for erecting into a carton, the blank comprising a first panel; a second panel foldably connected to the first panel; a third panel foldably connected to the second panel at a first fold line; a fourth panel foldably connected to the third panel at a second fold line; at least one first end flap extending along a first marginal area of the blank; at least one second end flap extending along a second marginal area of the blank; and a handle having a first gusset, a second gusset, a first tear stop and a second tear stop, wherein the handle is defined at least in part by a first concave

exterior line, a second concave exterior line, an opening line extending between the first and second exterior lines, a first oblique line extending from a point adjacent to the opening line, and a second oblique line extending from a point adjacent to the opening line, each of the first arcuate concave exterior line, the second arcuate concave exterior line, and the opening line extends at least partially across each of the second panel, the third panel, and the fourth panel, the opening line comprising a tear line that terminates at a first end of the first and second exterior lines in the second side panel and a second end of the first and second exterior lines in the fourth panel, a first oblique line extending from a point adjacent to the opening line and foldably connecting the first edge panel to the first central panel; and a second oblique line extending from a point adjacent to the opening line and foldably connecting the second edge panel to the first central panel, the first gusset being at least partially defined by the first arcuate concave exterior line and the opening line, and the second gusset being at least partially defined by the second arcuate concave exterior line and the opening line, the first gusset comprises a first central panel in the third panel, a first edge panel foldably connected to the first central panel and comprising at least a portion of the second panel and the third panel, and a second edge panel foldably connected to the first central panel and comprising at least a portion of the third panel and the fourth panel; and the second gusset comprises a second central panel in the third panel, a third edge panel foldably connected to the second central panel and comprising at least a portion of the second panel and the third panel, and a fourth edge panel foldably connected to the second central panel and comprising at least a portion of the third panel and the fourth panel, the first tear stop is spaced from the first end of the first and second exterior lines and comprises a first substantially V-shaped line and a first longitudinally extending line, the carton comprising a space of material being free from any form of weakening between the first tear stop and the first end of the first and second exterior lines, and the second tear stop is spaced from the second end of the first and second exterior lines, the carton comprising a space of material being free from any form of weakening between the second tear stop and the second end of the first and second exterior lines; each of the first and second tear stops comprises at least two cut lines forming a V shape extending from a vertex in the respective second or fourth panel to respective ends in the second or fourth panel, the ends of the two cut lines being spaced apart from a respective first or second fold line.

[0004.2] According to another aspect of the present invention there is provided a carton, comprising a first panel; a second panel adjacent to the first panel; a third panel adjacent to the second panel and foldably connected to the second panel and a first fold line; a fourth panel adjacent to the first and third panels and foldably connected to the third panel at a second fold line; a first end panel at a first end of the carton; a second end panel at a second end of the carton; and a handle having a first gusset, a second gusset, a first tear stop and a second tear stop, wherein the handle is defined at least in part by a first arcuate concave exterior line, a second arcuate concave exterior line, and an opening line extending between the first and second exterior lines, each of the first arcuate concave exterior line, the second arcuate concave exterior line, and the opening line extends at least partially across each of the second panel, the third panel, and the fourth panel, the opening line comprising a tear line and terminates at a first end of the first and second exterior lines in the second side panel and a second end of the first and second exterior lines in the fourth panel, the first gusset being at least partially defined by the first arcuate concave exterior line and the opening line, and the second gusset being at least partially defined by the second arcuate concave exterior line and the opening line, the first gusset comprises a first central panel in the third panel, a first edge panel foldably connected to the first central panel and comprising at least a portion of the second panel and the third panel, and a second edge panel foldably connected to the first central panel and comprising at least a portion of the third panel and the fourth panel; and the second gusset comprises a second central panel in the third panel, a third edge panel foldably connected to the second central panel and comprising at least a portion of the second panel and the third panel, and a fourth edge panel foldably connected to the second central panel and comprising at least a portion of the third panel and the fourth panel, the first tear stop is spaced from the first end of the first and second exterior lines in the second panel, the carton comprising a space of material being free from any form of weakening between the first tear stop and the first end of the first and second exterior lines, and the second tear stop is spaced from the second end of the first and second exterior lines in the fourth panel, the carton comprising a space of material being free from any form of weakening between the second tear stop and the second end of the first and second exterior lines; each of the first and second tear stops comprises at least two cut lines forming a V shape extending from a vertex in the respective second or fourth panel to a respective end in the second or fourth panel, the ends of the two cuts being spaced apart from a respective first or second fold line.

[0005] Those skilled in the art will appreciate the above stated advantages and other advantages and benefits of various additional embodiments reading the following detailed description of the embodiments with reference to the below-listed drawing figures.

[0006] According to common practice, the various features of the drawings discussed below are not necessarily drawn to scale. Dimensions of various features and elements in the drawings may be expanded or reduced to more clearly illustrate the embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

[0007] **FIG. 1** is a plan view of an exterior side of a blank used to form a carton according to a first embodiment of the invention.

[0008] **FIG. 2** is a detailed view of a handle of the carton according to the first embodiment.

[0009] **FIG. 3** illustrates the carton in a partially erected configuration.

[0010] **FIG. 4** illustrates the carton in a more fully erected configuration.

[0011] **FIG. 5** is a perspective view of the erected carton.

[0012] **FIG. 6** is another perspective view of the erected carton.

[0013] **FIG. 7** illustrates opening of the handle.

[0014] **FIG. 8** illustrates further opening of the handle.

[0015] **FIG. 9** is a top plan view of the carton with the handle opened and in a carrying configuration.

DETAILED DESCRIPTION

[0016] The handle of the present invention generally relates to a handle for a carton or other vessels. The present invention can be used, for example, in cartons that contain articles or products such as, for example, food and/or beverages. The articles can include beverage containers such as cans, bottles, PET containers, or other containers such as those used in packaging foodstuffs.

Further, the handle can be used in cartons that contain articles in boxes such as those used in packaging foodstuffs, household cleaners, and similar products.

[0017] FIG. 1 is a plan view of a blank 8 used to form a carton 200 (illustrated in FIGS. 5 and 6) according to a first embodiment of the invention. The blank 8 comprises a bottom panel 10 foldably connected to a top side panel 20 at a transverse fold line 21, a top panel 30 foldably connected to the top side panel 20 at a transverse fold line 31, and a bottom side panel 40 foldably connected to the top panel 30 at a transverse fold line 41. An adhesive panel 50 can be foldably attached to the bottom panel 10 at a transverse fold line 51. The top panel 30 may include stress relief lines 36, 38.

[0018] First and second bottom end flaps 12, 14 may be foldably connected to opposite ends of the bottom panel 10. First and second side end flaps 22, 24 may be foldably connected to opposite ends of the top side panel 20. First and second top end flaps 32, 34 may be foldably connected to opposite ends of the top panel 30. Third and fourth side end flaps 42, 44 may be foldably connected to opposite ends of the bottom side panel 40. The end flaps 12, 22, 32, 42 extend along a first marginal area of the blank 8 and may be foldably connected along a first longitudinal fold line 62. The end flaps 14, 24, 34, 44 extend along a second marginal area of the blank 8 and may be foldably connected along a second longitudinal fold line 64. The longitudinal fold lines 62, 64 may be straight fold lines, or may be offset at one or more locations to account for, for example, blank thickness. When the carton 200 is erected (FIG. 5), the end flaps 12, 22, 32, 42 close a first end of the carton 200, and the end flaps 14, 24, 34, 44 close a second end of the carton 200.

[0019] A dispenser 80 may be formed at one or more locations in the carton blank 8. The exemplary blank 8 is illustrated with a dispenser 80 at the second end of the blank. The dispenser 80 may be formed from, for example, a combination of cut lines, crease lines, tear lines, fold lines, or other lines of disruption in the blank 8.

[0020] A handle 100 is formed across the top side panel 20, the top panel 30, and the bottom side panel 40. The handle 100 is discussed in detail below with reference to FIG. 2.

[0021] Referring to FIG. 2, the handle 100 comprises a first arcuate, exterior line 102, a second arcuate, exterior line 104, and an opening line 106 extending between the first and second exterior lines 102, 104. First and second oblique lines 112, 116 extend from points adjacent to, which includes contacting, the opening line 106 to points adjacent to the first arcuate line 102. Third and fourth oblique lines 114, 118 extend from points adjacent to the opening line 106 to points adjacent to the second arcuate line 104. The first and third oblique lines 112, 114 may extend generally toward the intersections of the first and second exterior lines 102, 104, respectively, and the transverse fold line 31. The second and fourth oblique lines 116, 118 may extend generally toward the intersections of the exterior lines 102, 104, respectively, and the transverse fold line 41.

[0022] The lines of the handle 100 define first and second foldable gussets 130, 132 on respective first and second sides of the opening line 106. The first gusset 130 comprises a first central panel 141 and first and second edge panels 151, 161. The second gusset 132 comprises a second central panel 142 and third and fourth edge panels 152, 162. The edge panels 151, 152 can extend from the top side panel 20 to the top panel 30, and the edge panels 161, 162 can extend from the top panel 30 to the bottom side panel 40.

[0023] The arcuate exterior lines 102, 104 may terminate at their first and second ends at first and second arcuate cuts 154, 164, respectively. The first and second arcuate cuts 154, 164 are disposed in the handle 100 to define end edges of the gussets 130, 132 when the handle is opened, and to inhibit tearing beyond the length of the opening line 106. First and second tear stops 120, 121 may be spaced from the first and second cuts 154, 156. The first tear stop 120 comprises a first generally V-shaped line 122 and a first longitudinally extending line 124 spaced from the first end of the exterior lines 102, 104. The second tear stop 121 comprises a second generally V-shaped line 126 and a second longitudinally

extending line 128 spaced from the second end of the first and second exterior lines 102, 104. Generally, the tear stops 120, 121 are designed to limit or control the tear from the opening and/or use of the handle 100.

[0024] The first and second exterior lines 102, 104 may be, for example, formed by a series of cuts and creases (e.g., a cut/crease line) designed to allow the first and second gussets 130, 132 to fold inwardly when the handle 100 is accessed. The opening line 106 can be, for example, formed by a series of spaced cuts (e.g., a cut/space line). The opening line 106 is designed to be opened or torn upon penetration and may be generally referred to as, for example, a 'tear line.' The opening line 106 may also comprise an aperture extending along all or a part of the length of the opening line 106 to facilitate tearing and/or opening at the line 106. The oblique lines 112, 114, 116, 118 may be, for example, cut/space lines having smaller cut and space lengths than the opening line 106. The V-shaped lines 122, 126 can be, for example, crease lines or score lines, and the longitudinally extending lines 124, 128 can be, for example, cuts. Each of the cuts in the handle 100 can extend through the blank 8 (100% cuts).

[0025] The first and second arcuate lines 102, 104 can have generally continuously arcuate profiles, and can be described as generally continuously inwardly concave toward the opening line 106, and facing each other at their concave faces. In the embodiment illustrated in FIG. 2, the first and second exterior lines 102, 104 are continuously arcuate along the edge panels 151, 152, 161, 162 and along the central panels 141, 142. The lines 102, 104 generally define a flattened oval or elliptical outline as shown in FIG. 2.

[0026] FIG. 3 illustrates an initial step in erection of the carton 200, in which the blank 8 is folded so that the adhesive panel 50 is brought into contact with the bottom side panel 40 and secured by a suitable glue or other adhesive. Referring to FIG. 4, the blank 8 is partially opened so that it has a generally tubular sleeve shape, and the end flaps 12, 22, 32, 42 are folded and adhered together so that they close the first end of the carton 200.

[0027] Referring to **FIG. 5**, the end flaps **14, 24, 34, 44** may then be folded and adhered together so that they close the second end to complete erection of the carton **200**. Containers **C** (shown in **FIG. 9**) can be loaded into the partially formed carton **200** at any time before closing both ends of the carton **200**. The end flaps **12, 22, 32, 42** form a first end panel **210**, and the end flaps **14, 24, 34, 44** form a second end panel **220**. **FIG. 6** is a perspective view of the erected carton **200** with the top side panel **20** facing upwardly.

[0028] **FIGS. 7 and 8** illustrate a user forming a handle opening from the handle **100** to place the carton **200** into a carrying configuration. Referring to **FIG. 7**, a user may insert one or more fingers into the handle **100** by pressing into and tearing at the opening line **106**. Referring to **FIG. 8**, the second gusset **132** may then be tucked into the interior of the carton **200** as the opening line **106** tear extends into the bottom side panel **40**. Tucking of the second gusset **132** is enabled in part by deformation of the gusset **132**. Deformation of the second gusset **132** can be facilitated by, for example, folding at the oblique lines **114, 118**, which also allows the edge panels **152, 162** to fold inwardly during tucking of the gusset **132**.

[0029] In a similar manner, the first gusset **130** may be tucked into the interior of the carton **200**. **FIG. 9** is a top plan view of the carton **200** with both sides of the handle **100** opened, and with both gussets **130, 132** tucked into the carton interior. The locations of the folded first and second gussets **130, 132** are indicated by hidden lines in **FIG. 9**. The carton **200** is now in a carrying configuration in which a user may grasp the carton at either side of the handle **100**, with the user's fingers pressing against one of the tucked gussets **130, 132**.

[0030] The double-sided handle **100** eases lifting and carrying of the carton **200** and allows for carrying from either side of the handle **100**. For example, in at least some configurations, the handle **100** provides comfort to a user carrying the carton **200** by allowing engagement of the handle **100** without the user's hand contacting any raw or torn edge of the carton **200**, while also providing cushioning to the user's hands by virtue of the tucked gussets **130, 132**. The

handle 100 therefore provides cushioning on both of its sides, regardless of which side the user decides to access. While the handle 100 is double-sided, the user can elect to open a single side of the handle 100 at either of the gussets 130, 132 in order to carry the carton 200. Tucking of the gussets 130, 132 is facilitated by the oblique handle lines 112, 114, 116, 118.

[0031] The handle 100 also provides strength and resistance to tearing during lifting and carrying of the carton 200. Referring to FIGS. 1 and 7-9, the handle 100, which may extend downwardly into one or both of the first and second side panels 20, 40, allows some of the stress of lifting to be transferred along the vertically extending side panels 20, 40. Additionally, the profiles of the exterior lines 102, 104, which may be generally continuously inwardly concave and arcuate, prevent stress concentrations in the top panel 30 and side panels 20, 40 along and about the periphery of the handle 100.

[0032] Additionally, the handle 100 can allow for flexure and bowing of the top panel 30 while reducing bowing in the first and second side panels 20, 40. This flexure enables the carton 200 to maintain contact and/or support for articles disposed in the carton.

[0033] **Example 1**

[0034] A parallelepipedal carton 200 as illustrated in FIGS. 5-6 accommodated eight 12 ounce petaloid bottles in a 2x4 arrangement. Referring to FIG. 5, the carton 200 had a height **H** of about 6.75 in. and a width **W** of about 5.125 in. The carton 200 was constructed of solid unbleached sulfate (SUS) board. The fold lines 62, 64 were cut/crease lines with the cuts extending through the blank 8 (i.e., 100% cuts). The fold lines 21, 31, 41, 51 were crease lines. Referring to FIG. 2, the handle 100 had a depth **D_H** of about 1.5 in. and a width **W_H** of about 10.375 in. The handle 100 was symmetric about the opening line 106. The first and second arcuate exterior lines 102, 104 were formed from cut/crease lines with 100% cuts, and the opening line 106 was formed from a cut/space line with 100% cuts. The oblique lines 112, 114, 116, 118 were also cuts/space lines with 100% cuts.

[0035] According to the embodiments discussed above, although the exterior lines **102**, **104** of the handle **100** are illustrated as continuously arcuate, the general form of the handle **100** may be, for example, achieved by sequential linear cuts and/or creases in a concave arrangement, etc. For example, linear lines or segments may be used to define an outline that is relatively thick at a central portion (such as at dimension **D_H** in **FIG. 2**), and relatively thin at the ends or outside edges of the gussets, with the exterior lines being generally continuously concave and arcuate across the length of the handle. Such a design could be characterized as tapered at the edges of the gussets.

[0036] In the above embodiments, the carton **200** is described as accommodating petaloid bottle containers **C** in 2x4 configuration. Other types of containers, packages, articles, and other items, however, can be accommodated within a carton according to the present invention. The dimensions of the blank **8** may also be altered, for example, to accommodate various container forms. For example, the carton into which the handle of the present invention is placed also would work satisfactorily if the carton were sized and shaped to hold articles in other configurations, such as 3x4, 4x3, 3x6, 2x4, 2x5, etc.

[0037] The carton **200** is illustrated as having a dispenser **80** allowing access to the carton contents from an end of the carton. Other opening features, if opening features are desired, can be provided to provide easy access to the carton contents. Additionally, positioning assemblies that position the articles within the carton may be included.

[0038] The handle detailed herein can be provided or used with any container, box, carton, etc. In fact, multiple handles, such as the one detailed herein, can be provided in alternate, opposite, or adjacent panels. Such multiple handles could be used to lift and/or carry larger, bulkier, or other cartons that would benefit from such multiple handles.

[0039] The blank 8 according to the present invention can be, for example, formed from coated paperboard and similar materials. For example, the interior and/or exterior sides of the blank can be coated with a clay coating. The clay coating may then be printed over with product, advertising, price coding, and other information or images. The blank may then be coated with a varnish to protect any information printed on the blanks. The blank may also be coated with, for example, a moisture barrier layer, on either or both sides of the blank. In accordance with the exemplary embodiments, the blank may be constructed of paperboard of a caliper such that it is heavier and more rigid than ordinary paper. The blank can also be constructed of other materials, such as cardboard, hard paper, or any other material having properties suitable for enabling the handle 100 to function at least generally as described above. The blank can also be laminated to or coated with one or more sheet-like materials at selected panels or panel sections.

[0040] In the present invention, a fold line can be any substantially linear, although not necessarily straight, form of weakening that facilitates folding therealong. More specifically, but not for the purpose of narrowing the scope of the present invention, fold lines include: a score line, such as lines formed with a blunt scoring knife, or the like, which creates a crushed portion in the material along the desired line of weakness; a cut that extends partially into a material along the desired line of weakness, and/or a series of cuts that extend partially into and/or completely through the material along the desired line of weakness; and various combinations of these features. In situations where cutting is used to create a fold line, typically the cutting will not be overly extensive in a manner that might cause a reasonable user to incorrectly consider the fold line to be a tear line.

[0041] The above embodiments may be described as having one or panels adhered together by glue. The term "glue" is intended to encompass all manner of adhesives commonly used to secure carton panels in place.

[0042] The foregoing description of the invention illustrates and describes the present invention. Additionally, the disclosure shows and describes only selected embodiments of the invention, but it is to be understood that the invention is capable of use in various other combinations, modifications, and environments and is capable of changes or modifications within the scope of the inventive concept as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art.

WHAT IS CLAIMED IS:

1. A blank for erecting into a carton, the blank comprising:
 - a first panel;
 - a second panel foldably connected to the first panel;
 - a third panel foldably connected to the second panel at a first fold line;
 - a fourth panel foldably connected to the third panel at a second fold line;
 - at least one first end flap extending along a first marginal area of the blank;
 - at least one second end flap extending along a second marginal area of the blank; and
 - a handle having a first gusset, a second gusset, a first tear stop and a second tear stop,
 wherein

the handle is defined at least in part by a first arcuate concave exterior line, a second arcuate concave exterior line, and an opening line extending between the first and second exterior lines, each of the first arcuate concave exterior line, the second arcuate concave exterior line, and the opening line extends at least partially across each of the second panel, the third panel, and the fourth panel, the opening line comprising a tear line that terminates at a first end of the first and second exterior lines in the second panel and a second end of the first and second exterior lines in the fourth panel,

the first gusset being at least partially defined by the first arcuate concave exterior line and the opening line, and the second gusset being at least partially defined by the second arcuate concave exterior line and the opening line,

the first gusset comprises a first central panel in the third panel, a first edge panel foldably connected to the first central panel and comprising at least a portion of the second panel and the third panel, and a second edge panel foldably connected to the first central panel and comprising at least a portion of the third panel and the fourth panel,

the second gusset comprises a second central panel in the third panel, a third edge panel foldably connected to the second central panel and comprising at least a portion of the second panel and the third panel, and a fourth edge panel foldably connected to the second central panel and comprising at least a portion of the third panel and the fourth panel,

the first tear stop is spaced from the first end of the first and second exterior lines in the second panel, the carton comprising a space of material being free from any form of weakening between the first tear stop and the first end of the first and second exterior lines, and

the second tear stop is spaced from the second end of the first and second exterior lines in the fourth panel, the carton comprising a space of material being free from any form

of weakening between the second tear stop and the second end of the first and second exterior lines;

each of the first and second tear stops comprises at least two cut lines forming a V shape extending from a vertex in the respective second or fourth panel to respective ends in the second or fourth panel, the ends of the two cut lines being spaced apart from a respective first or second fold line.

2. The blank of claim 1, wherein the first and second exterior lines are substantially continuously arcuate.

3. The blank of claim 2, wherein the first gusset is disposed on a first side of the opening line, and the second gusset is disposed on a second side of the opening line.

4. The blank of claim 3, wherein the handle is further defined at least in part by:

a first oblique line extending from a point adjacent to the opening line and foldably connecting the first edge panel to the first central panel; and

a second oblique line extending from a point adjacent to the opening line and foldably connecting the second edge panel to the first central panel.

5. The blank of claim 4, wherein the handle is further defined at least in part by:

a third oblique line extending from a point adjacent to the opening line and foldably connecting the third edge panel to the second central panel; and

a fourth oblique line extending from a point adjacent to the opening line and foldably connecting the fourth edge panel to the second central panel.

6. The blank of claim 4, wherein the first oblique line extends adjacent to the first fold line between the second and third panels, and the second oblique line extends adjacent to the second fold line between the third and fourth panels.

7. The blank of claim 6, wherein the first tear stop comprises a first longitudinally extending line extending from the vertex of the first tear stop, the first longitudinally extending line being adjacent to and spaced from the first end of the first and second exterior lines.

8. The blank of claim 3, wherein the first end of the first and second exterior lines comprises a first arcuate cut intersecting a first terminal end of the opening line in the second panel, and the second end of the first and second exterior lines comprises a second arcuate cut intersecting a second terminal end of the opening line in the fourth panel.

9. The blank of claim any preceding claim, wherein the first tear stop comprises a first longitudinally extending line extending from the vertex of the first tear stop, with the first longitudinally extending line being adjacent to and spaced from the first end of the first and second exterior lines.

10. The blank of claim 3, wherein:
the first and second exterior lines are at least in part defined by creases.

11. A blank for erecting into a carton, the blank comprising:
a first panel;
a second panel foldably connected to the first panel;
a third panel foldably connected to the second panel at a first fold line;
a fourth panel foldably connected to the third panel at a second fold line;
at least one first end flap extending along a first marginal area of the blank;
at least one second end flap extending along a second marginal area of the blank; and
a handle having a first gusset, a second gusset, a first tear stop and a second tear stop,
wherein

the handle is defined at least in part by a first concave exterior line, a second concave exterior line, an opening line extending between the first and second exterior lines, a first oblique line extending from a point adjacent to the opening line, and a second oblique line extending from a point adjacent to the opening line, each of the first arcuate concave exterior line, the second arcuate concave exterior line, and the opening line extends at least partially across each of the second panel, the third panel, and the fourth panel, the opening line comprising a tear line that terminates at a first end of the first and second exterior lines in the second side panel and a second end of the first and second exterior lines in the fourth panel,

a first oblique line extending from a point adjacent to the opening line and foldably connecting the first edge panel to the first central panel; and

a second oblique line extending from a point adjacent to the opening line and foldably connecting the second edge panel to the first central panel,

the first gusset being at least partially defined by the first arcuate concave exterior line and the opening line, and the second gusset being at least partially 10 defined by the second arcuate concave exterior line and the opening line,

the first gusset comprises a first central panel in the third panel, a first edge panel foldably connected to the first central panel and comprising at least a portion of the second panel and the third panel, and a second edge panel foldably connected to the first central panel and comprising at least a portion of the third panel and the fourth panel; and

the second gusset comprises a second central panel in the third panel, a third edge panel foldably connected to the second central panel and comprising at least a portion of the second panel and the third panel, and a fourth edge panel foldably connected to the second central panel and comprising at least a portion of the third panel and the fourth panel,

the first tear stop is spaced from the first end of the first and second exterior lines and comprises a first substantially V-shaped line and a first longitudinally extending line, the carton comprising a space of material being free from any form of weakening between the first tear stop and the first end of the first and second exterior lines, and

the second tear stop is spaced from the second end of the first and second exterior lines, the carton comprising a space of material being free from any form of weakening between the second tear stop and the second end of the first and second exterior lines;

each of the first and second tear stops comprises at least two cut lines forming a V shape extending from a vertex in the respective second or fourth panel to respective ends in the second or fourth panel, the ends of the two cut lines being spaced apart from a respective first or second fold line.

12. The blank of claim 11, wherein the first oblique line extends adjacent to the first fold line between the second and third panels, and the second oblique line extends adjacent to the second fold line between the third and fourth panels.

13. The blank of claim 12, wherein the handle is further defined in part by:

a third oblique line extending from a point adjacent to the opening line and foldably connecting the third edge panel to the second central panel; and

a fourth oblique line extending from a point adjacent to the opening line and foldably connecting the fourth edge panel to the second central panel.

14. The blank of claim 13, wherein the first end of the first and second exterior lines comprises a first arcuate cut intersecting a first terminal end of the opening line in the second

panel, and the second end of the first and second exterior lines comprises a second arcuate cut intersecting a second terminal end of the opening line in the fourth panel.

15. The blank of any one of claims 11 to 14, wherein the first and second exterior lines are at least in part defined by creases.

16. A carton, comprising:

a first panel;

a second panel adjacent to the first panel;

a third panel adjacent to the second panel and foldably connected to the second panel and a first fold line;

a fourth panel adjacent to the first and third panels and foldably connected to the third panel at a second fold line;

a first end panel at a first end of the carton;

a second end panel at a second end of the carton; and

a handle having a first gusset, a second gusset, a first tear stop and a second tear stop, wherein

the handle is defined at least in part by a first arcuate concave exterior line, a second arcuate concave exterior line, and an opening line extending between the first and second exterior lines, each of the first arcuate concave exterior line, the second arcuate concave exterior line, and the opening line extends at least partially across each of the second panel, the third panel, and the fourth panel, the opening line comprising a tear line and terminates at a first end of the first and second exterior lines in the second side panel and a second end of the first and second exterior lines in the fourth panel,

the first gusset being at least partially defined by the first arcuate concave exterior line and the opening line, and the second gusset being at least partially defined by the second arcuate concave exterior line and the opening line,

the first gusset comprises a first central panel in the third panel, a first edge panel foldably connected to the first central panel and comprising at least a portion of the second panel and the third panel, and a second edge panel foldably connected to the first central panel and comprising at least a portion of the third panel and the fourth panel; and

the second gusset comprises a second central panel in the third panel, a third edge panel foldably connected to the second central panel and comprising at least a portion of the second panel and the third panel, and a fourth edge panel foldably connected to the second central panel and comprising at least a portion of the third panel and the fourth panel,

the first tear stop is spaced from the first end of the first and second exterior lines in the second panel, the carton comprising a space of material being free from any form of weakening between the first tear stop and the first end of the first and second exterior lines, and

the second tear stop is spaced from the second end of the first and second exterior lines in the fourth panel, the carton comprising a space of material being free from any form of weakening between the second tear stop and the second end of the first and second exterior lines;

each of the first and second tear stops comprises at least two cut lines forming a V shape extending from a vertex in the respective second or fourth panel to a respective end in the second or fourth panel, the ends of the two cuts being spaced apart from a respective first or second fold line.

17. The carton of claim 16, wherein the first and second exterior lines are substantially continuously arcuate.

18. The carton of claim 16, wherein the handle is further defined at least in part by:
a first oblique line extending from a point adjacent to the opening line and foldably connecting the first edge panel to the first central panel; and
a second oblique line extending from a point adjacent to the opening line and foldably connecting the second edge panel to the first panel.

19. The carton of claim 18, wherein the handle is further defined at least in part by:
a third oblique line extending from a point adjacent to the opening line and foldably connecting the third edge panel to the second central panel; and
a fourth oblique line extending from a point adjacent to the opening line and foldably connecting the fourth edge panel to the second panel.

20. The carton of claim 18, wherein the first oblique line extends adjacent to the first fold line between the second and third panels, and the second oblique line extends adjacent to the second fold line between the third and fourth panels.

21. The carton of claim 20, wherein the first tear stop comprises a first longitudinally extending line extending from the vertex of the first tear stop, with the first longitudinally extending line being adjacent to and spaced from the first end of the first and second exterior

lines.

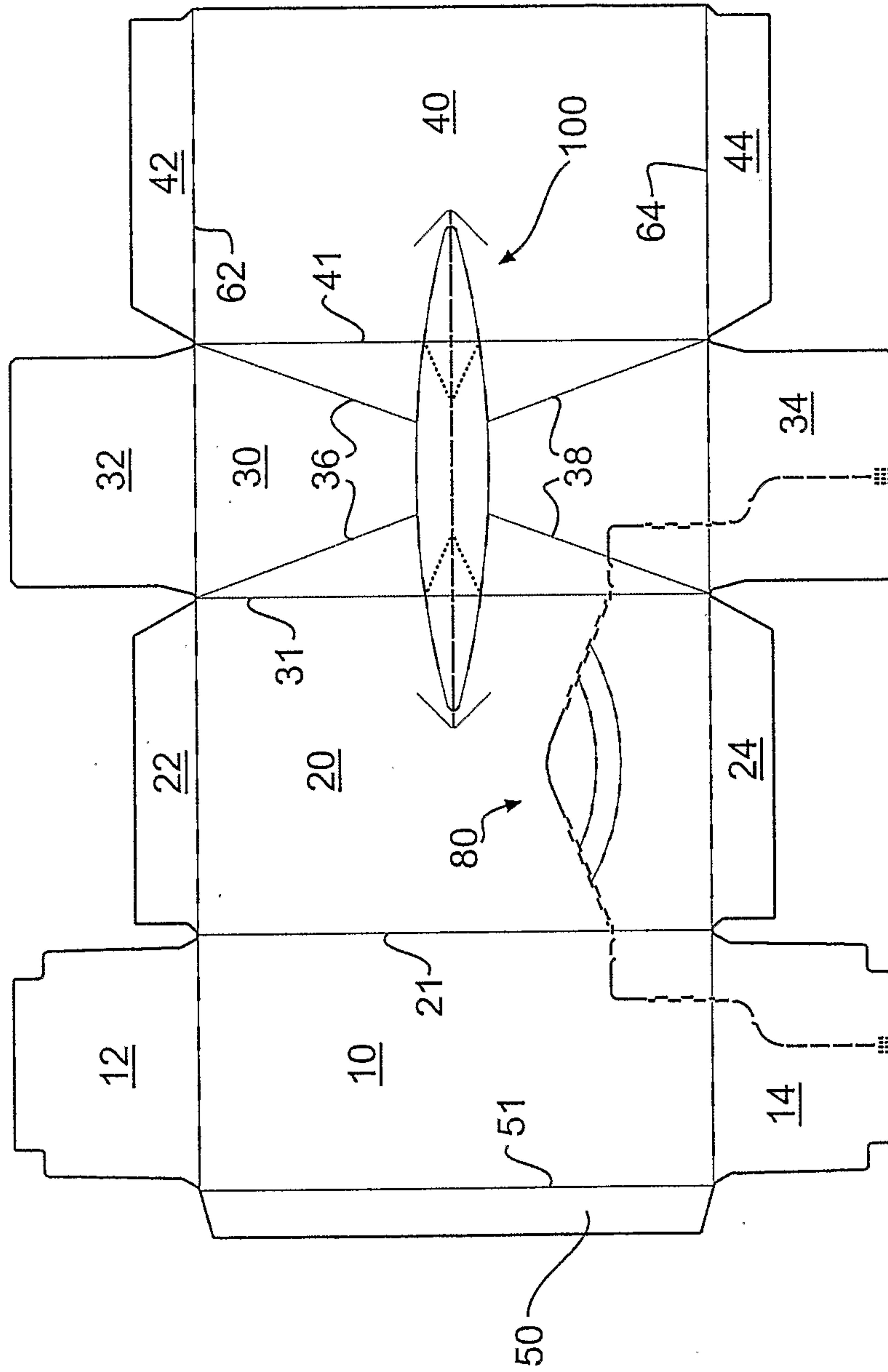
22. The carton of any one of claim 16, wherein the first end of the first and second exterior lines comprises a first arcuate cut intersecting a first terminal end of the opening line in the second panel, and the second end of the first and second exterior lines comprises a second arcuate cut intersecting a second terminal end of the opening line in the fourth panel.

23. The carton of claim 16, wherein: the first and second exterior lines are at least in part defined by creases.

24. The blank of claim 1, wherein:
the second panel forms a first side panel in the carton;
the third panel forms a top panel in the carton; and
the fourth panel forms a second side panel in the carton.

25. The blank of claim 11, wherein:
the second panel forms a first side panel in the carton;
the third panel forms a top panel in the carton; and
the fourth panel forms a second side panel in the carton.

26. The carton of claim 16, wherein:
the second panel is a first side panel;
the third panel is a top panel; and
the fourth panel is a second side panel.

**FIG. 1**

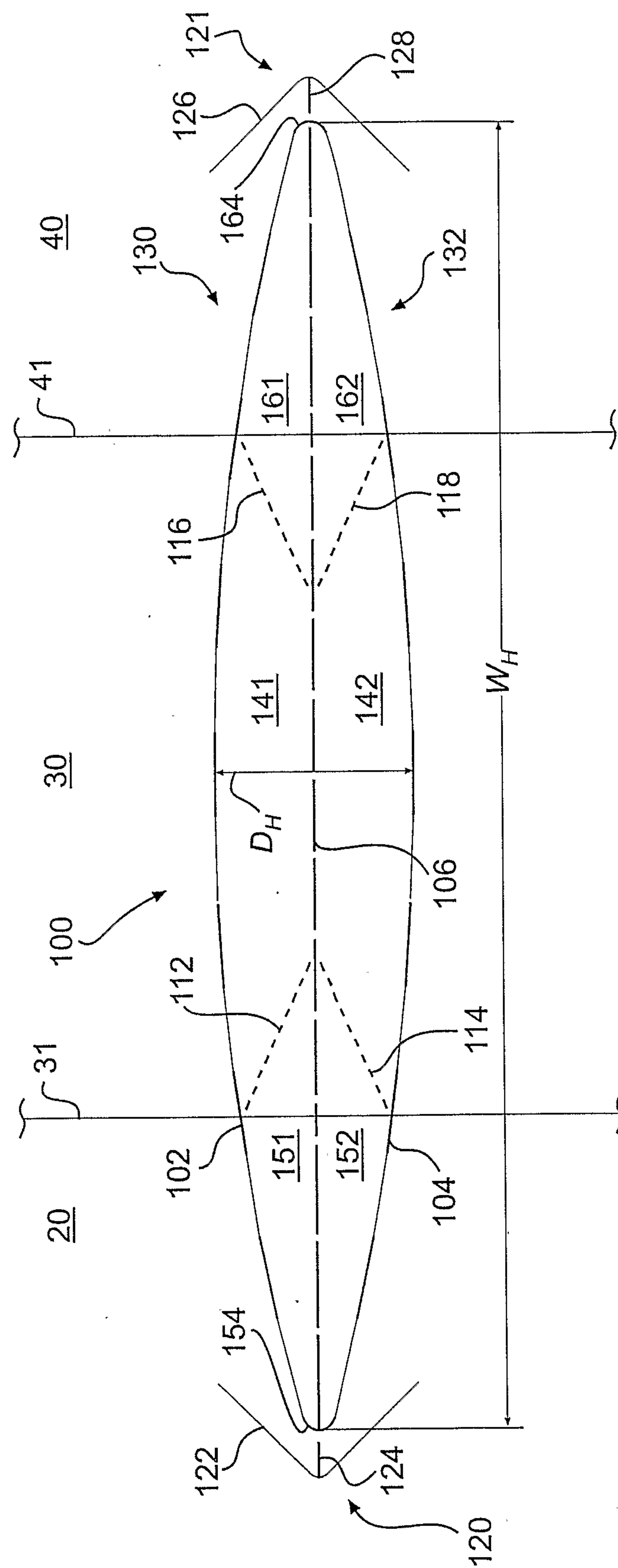
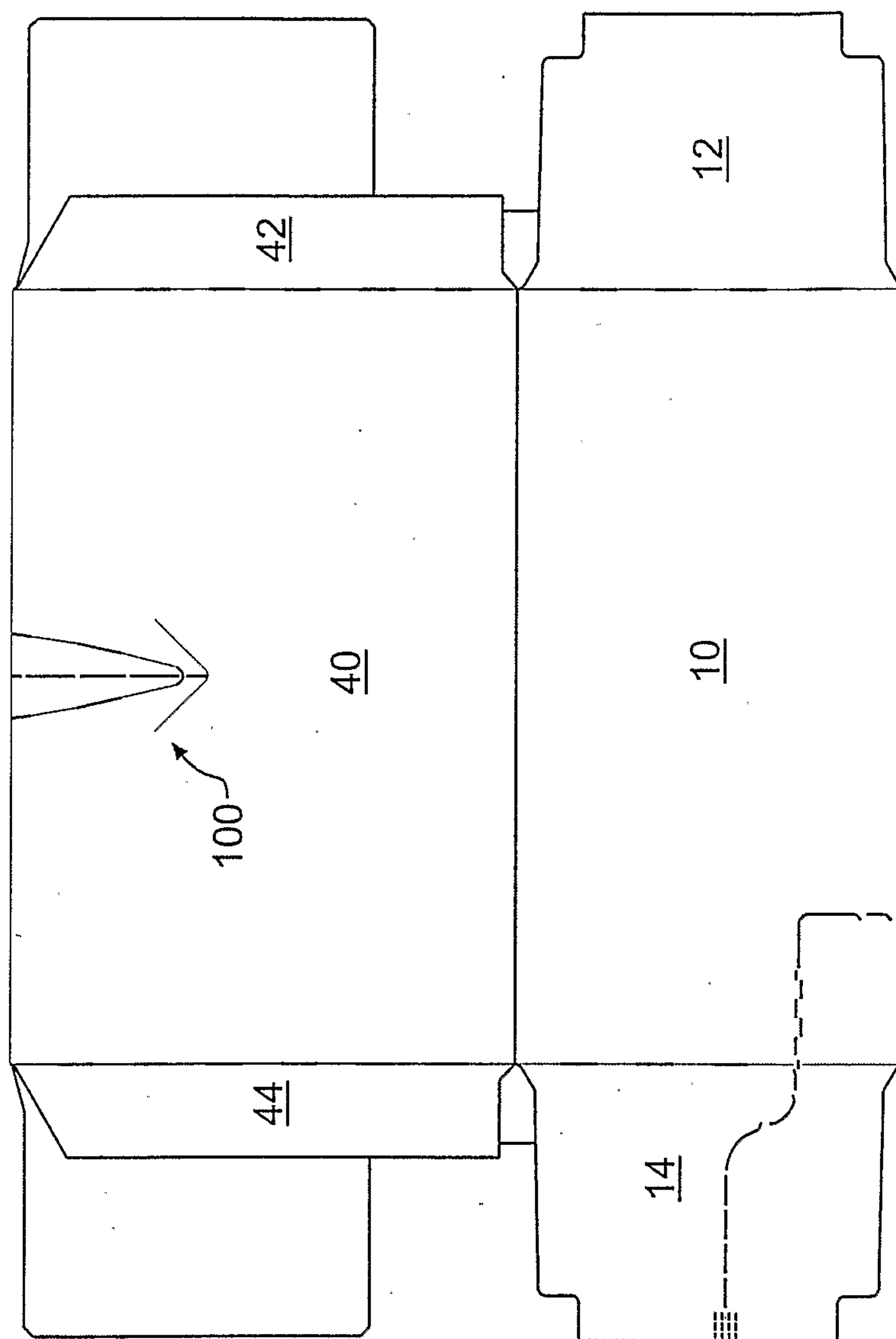
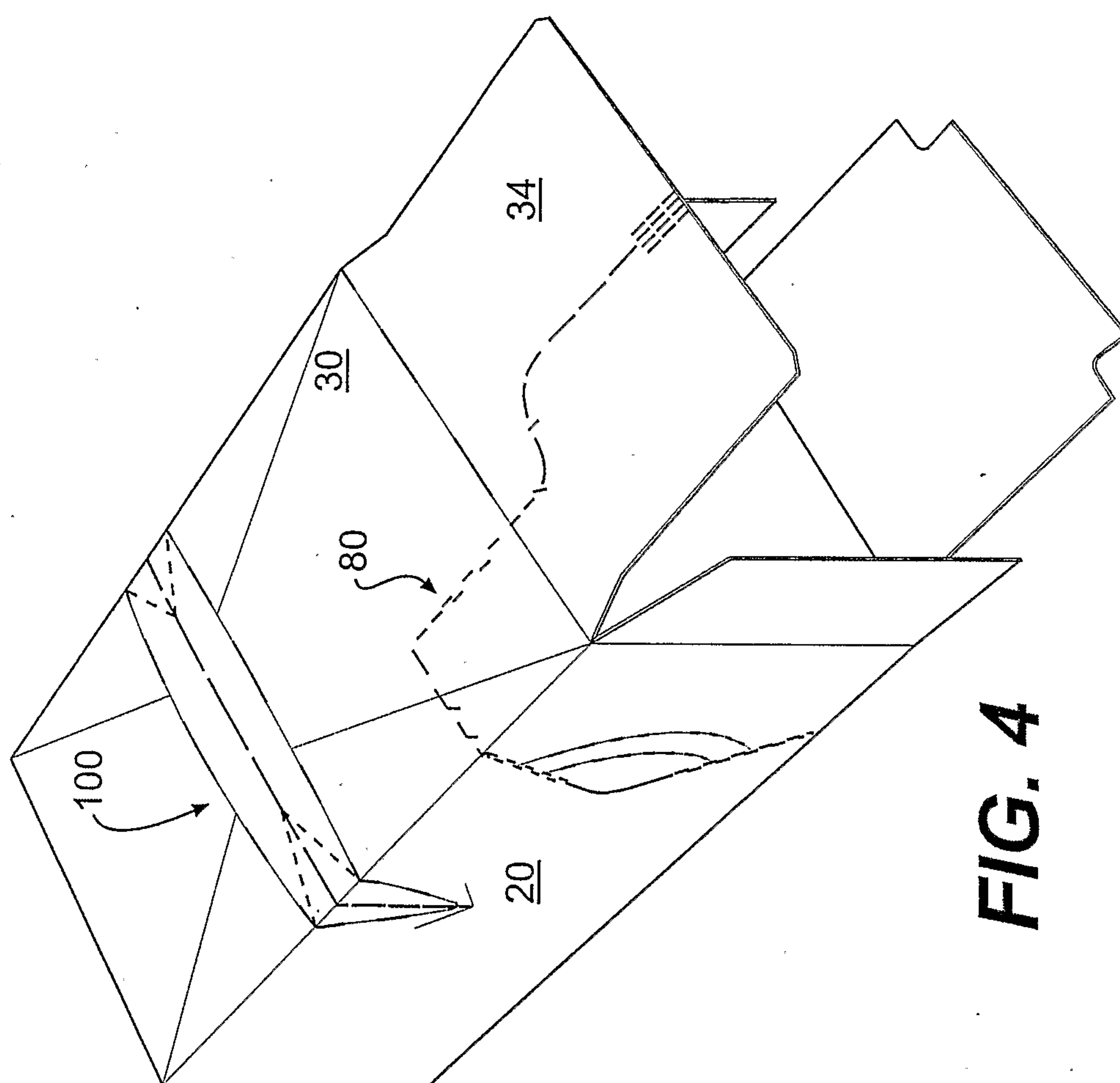
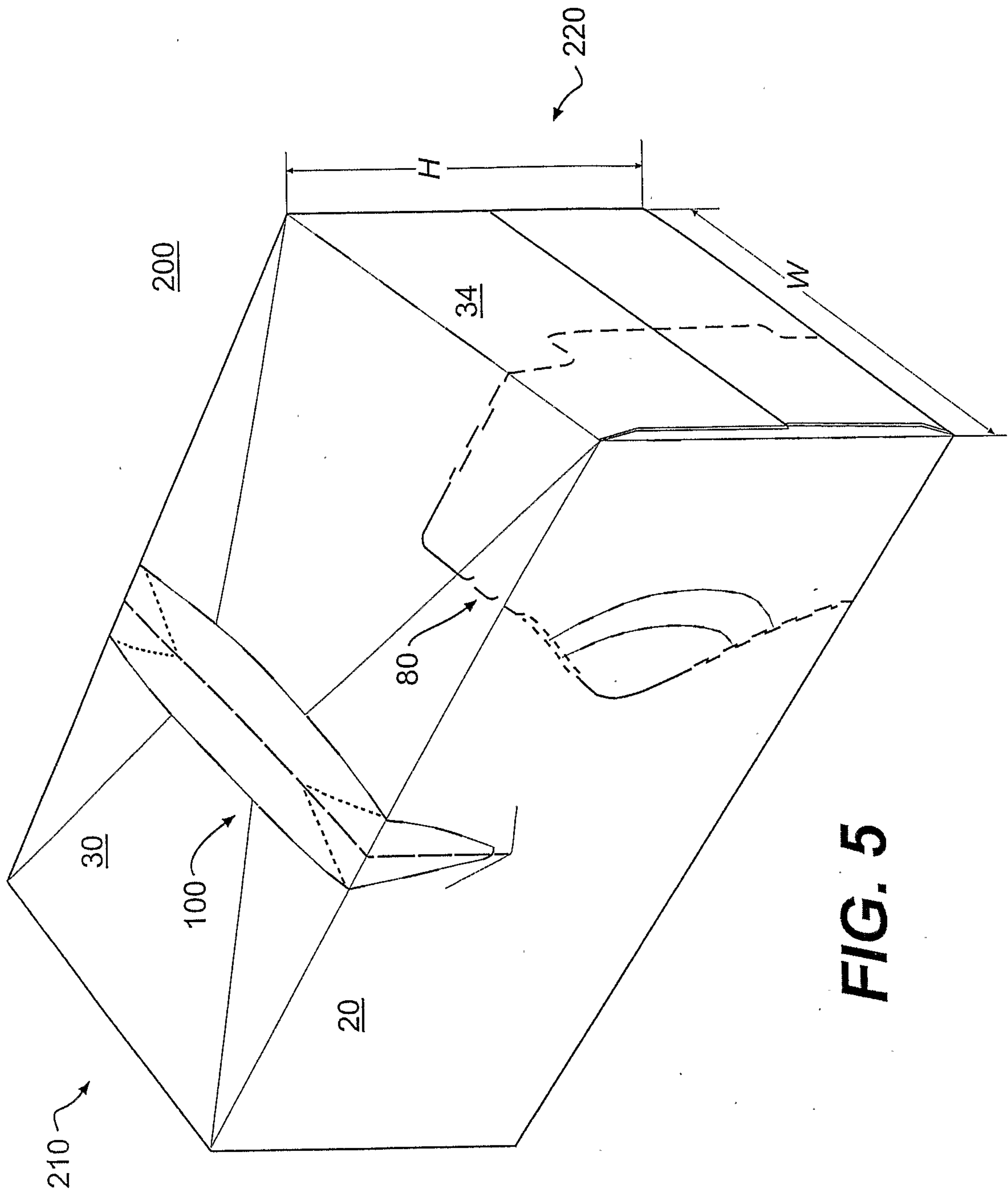
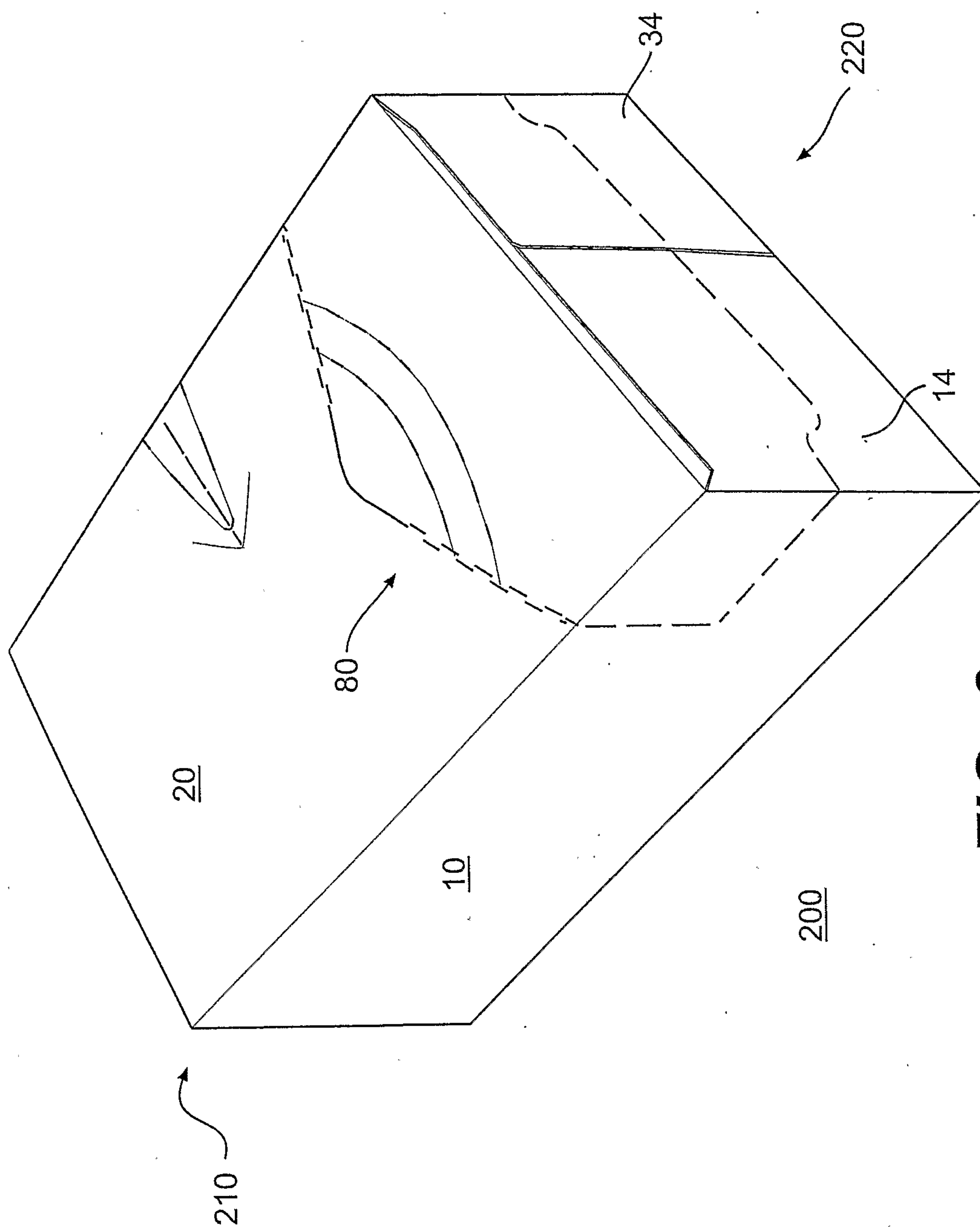


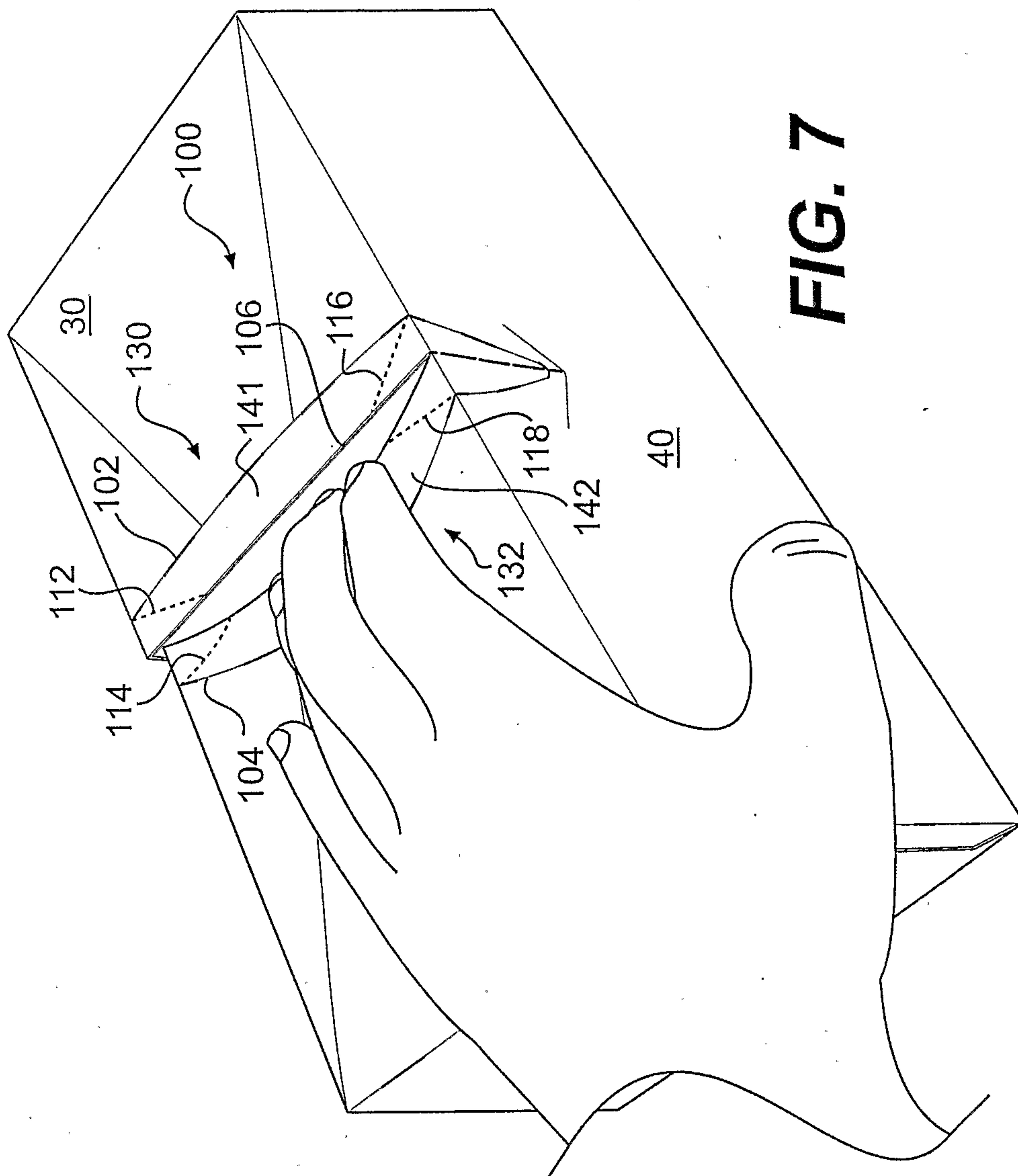
FIG. 2

**FIG. 3**



**FIG. 5**

**FIG. 6**

**FIG. 7**200

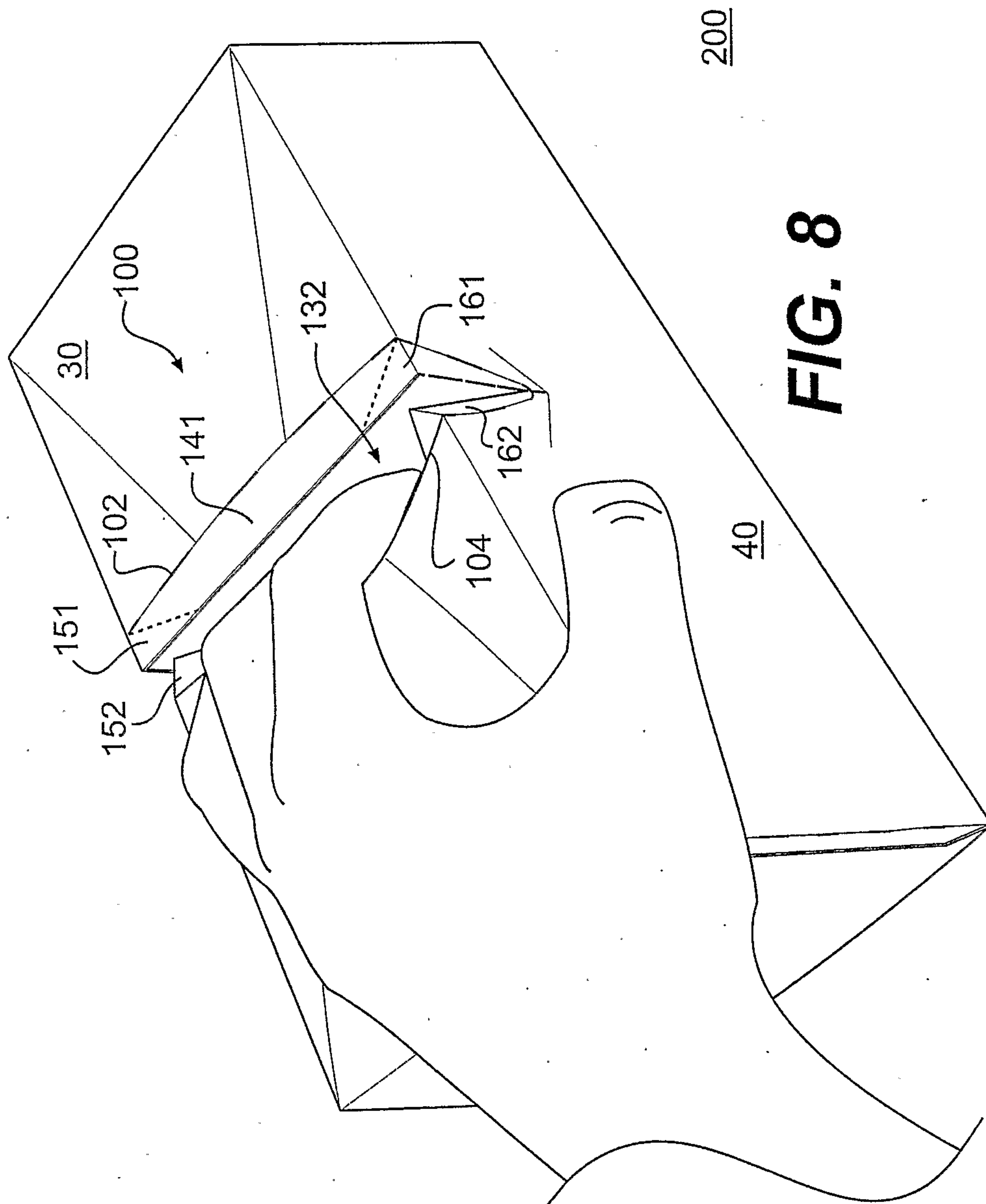
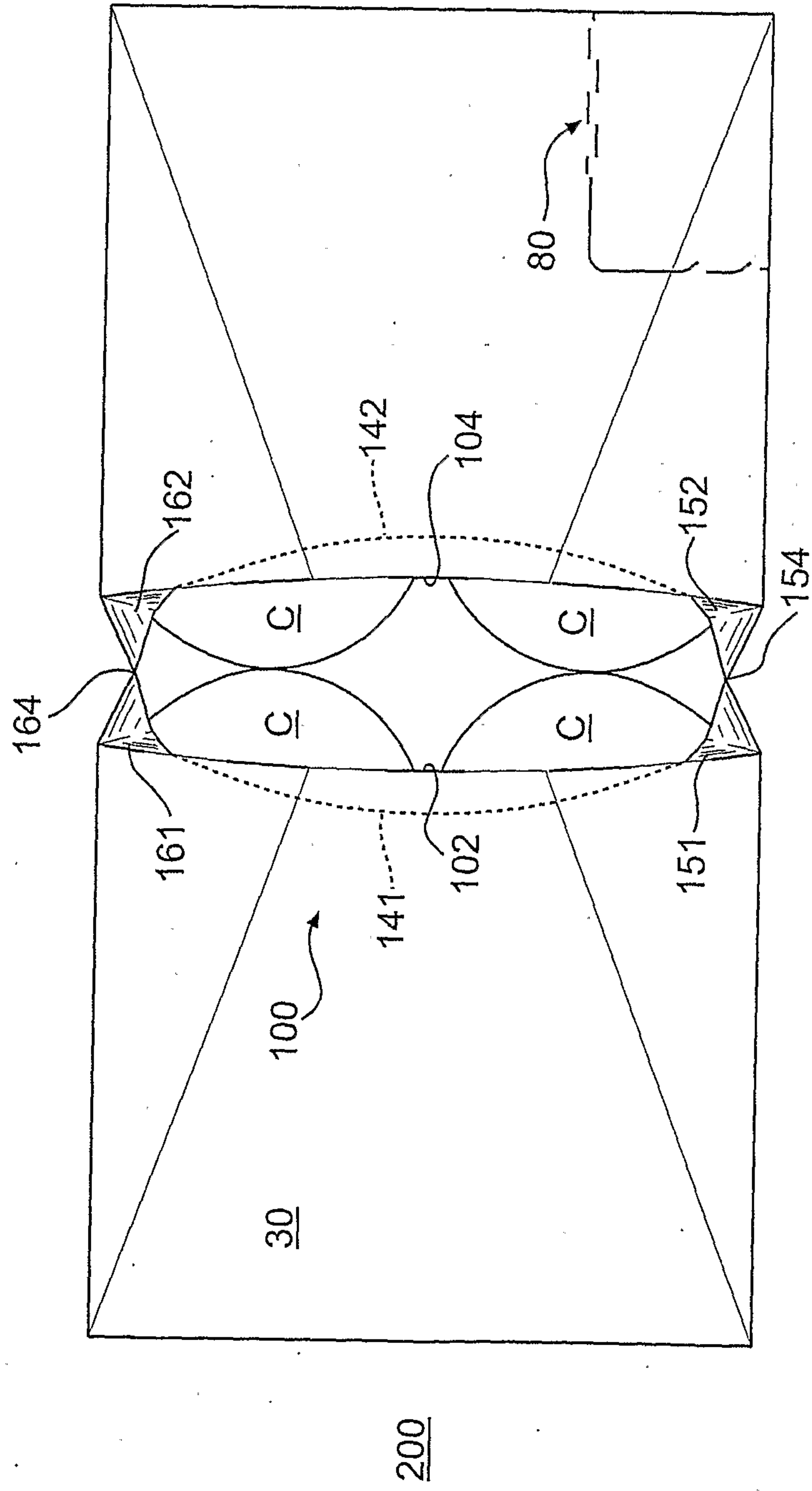
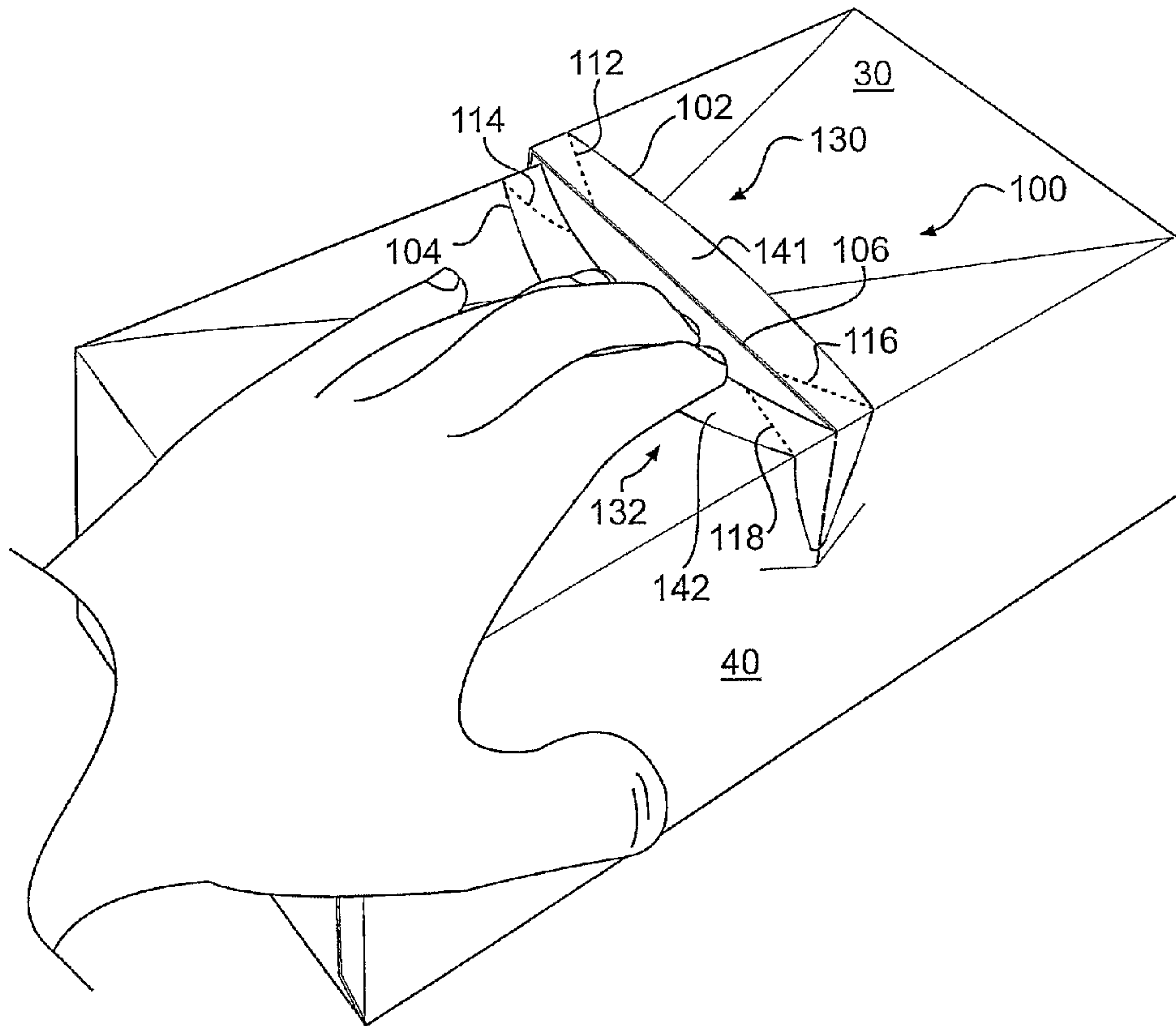


FIG. 8





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