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(54) **Handle structure and blank**

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(56) References cited:  
**EP-A- 0 816 238 WO-A2-00/32481**  
**US-A- 5 333 734 US-A- 5 385 234**  
**US-A- 5 480 091 US-A- 5 873 515**

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## Description

### Technical Field of the Invention

**[0001]** The invention relates to a handle structure for a carton, a carton comprising such a handle structure and a blank for forming such a carton.

### Background of the Invention

**[0002]** Handles are useful in cartons as a means for transporting the cartons. A problem in cartons of flexible material wherein a handle is formed in a panel of the carton is that the substantial stress forces are typically concentrated upon the handle or undesirable portions of the panel in which the handle resides. It can be appreciated that it could be desirable to have a handle structure for a carton of flexible material that does not impart significant forces upon undesirable portions of the handle or the panel in which the handle resides.

**[0003]** It is often desirable to have a carton that presents walls that are as aesthetically appealing as possible to potential purchasers of the package formed by the carton. Thus, it can be appreciated that it would be desirable to have a carton with a handle structure that functions within a carton wall or panel that is also aesthetically appealing.

**[0004]** US Patent Number 5,873,515 discloses a handle structure comprising a multi-ply handle section for a carton comprising a central hand grip formed in a top panel between first and second hand openings.

### Summary of the Intention

**[0005]** According to a first aspect of the invention, there is provided a handle structure for a carton having a handle panel and a strap member integrally conjoined with the handle panel, which strap member has strap edges substantially disjoined from the handle panel, characterised by comprising severance line segments extending from first end points proximate each respective corner of the handle panel to second end points proximate a centrally disposed region of said strap member and in that a portion of each severance line segment defines a first edge of a respective connecting tab, and further in that additional severance lines extend from the centrally disposed region of the strap member to define second edges of the connecting tabs opposite said first edges, the connecting tabs interconnecting the strap member and adjacent regions of the handle panel such that when a force that is substantially normal to a plane in which said handle panel lies is exerted upon said centrally disposed region, said strap member is flexed outwardly of said plane to a biased position proximate said plane.

**[0006]** Preferably, the aforesaid first edges of the connecting tabs are spaced from the aforesaid second edges of the connecting tabs.

**[0007]** Preferably, the aforesaid severance lines re-

main unbroken until the strap member flexes outwardly of the aforesaid plane.

**[0008]** Preferably, each said severance line segment comprises a portion that is substantially parallel to opposing side edges of the handle panel.

**[0009]** Alternatively, a portion of each said severance line segment diverges from a proximate one of opposing side edges of the handle panel as the severance line segment extends from said second end point to said first end point.

**[0010]** According to an optional feature of this aspect of the invention, there further comprises a gusset formed from a non-coincident pair of a score line and a perforated line disposed at each of said corners and having a first end adjacent the respective said corner and a second end adjacent said first end point of said severance line segments

**[0011]** According to an optional feature of this aspect of the invention, there further comprises a plurality of first frangible members interconnecting said strap edges and adjacent portions of the handle panel disposed such that when a force, exerted to the set up carton that is substantially perpendicular to a notional plane of the handle panel is exerted upon said centrally disposed region of said strap member, said strap member flexes outwardly of the handle panel in a coordinated sequence beginning closest said centrally disposed region and progressing toward respective ones of opposing side edges of the handle panel.

**[0012]** According to an optional feature of this aspect of the invention, there further comprises a plurality of second frangible members bridging said severance line segments and disposed such that when a force exerted to the set up carton that is substantially perpendicular to a notional plane of the handle panel is exerted upon said centrally disposed region of said strap member, said strap member flexes outwardly of the handle panel in a coordinated sequence beginning closest said centrally disposed region and progressing toward respective ones of opposing side edges of the handle panel.

**[0013]** According to an optional feature of this aspect of the invention, there is provided a carton having a handle structure.

**[0014]** Preferably, an array of cylindrical articles of a predetermined diameter are to be packaged within said carton and said first end points lie on or adjacent a tangent line at which the handle panel is tangent to a cylindrical sidewall of a body of one of the articles disposed at the respective corner of the array adjacent the handle panel.

**[0015]** A second aspect of the invention provides a blank for forming a carton having a plurality of wall panels for forming the top, base, opposing sides and ends of the carton and a handle structure comprising a handle panel and a strap member integrally conjoined with the handle panel, which strap member has strap edges substantially disjoined from the handle panel, characterised by comprising severance line segments extending from first end points proximate each respective corner of the handle

panel to second end points proximate a centrally disposed region of said strap member and in that a portion of each severance line segment defines a first edge of a respective connecting tab, and further in that additional lines of severance extend from the centrally disposed region of the strap member to defines second edges of the connecting tabs opposite said first edges, the connecting tabs interconnecting the strap member and adjacent regions of the handle panel, such that when a force that is substantially normal to a plane in which said handle panel lies is exerted upon said centrally disposed region, said strap member is flexed outwardly of said plane to a biased position proximate said plane

**[0016]** Preferably, each said severance line segment comprises a portion that is substantially parallel to opposing side edges of the handle panel.

**[0017]** Preferably, a portion of each said severance line segment diverges from a proximate one of opposing side edges of the handle panel as said severance line segment extends from said second end point to said first end point.

**[0018]** Preferably, there further comprises a gusset formed from a non-coincident pair of a score line and a perforated line disposed at each of said corners having a first end adjacent the respective said corner and a second end adjacent said first end point of said severance line segment.

**[0019]** Other advantages and objects of the present invention will be apparent from the following description, the accompanying drawings and appended claims.

#### Brief Description of the Drawings

##### **[0020]**

Fig. 1 is an isometric illustration of a carton having a handle structure in accordance with a preferred embodiment of the invention.

Fig. 2 is an isometric illustration of the carton of Fig. 1 with the handle member lifted upwardly.

Fig. 3 is a plan view of a blank for forming the carton with the handle structure shown in Fig. 1.

Fig. 4 is a view of a blank for forming a carton having a handle structure in accordance with an alternate preferred embodiment of the invention.

Fig. 5 is an isometric illustration of a carton having a handle structure in accordance with an alternate preferred embodiment of the invention formed from the blank of Fig- 4.

#### Detailed Description of the Preferred Embodiments

**[0021]** Throughout the drawings, the same reference numerals are used to denote the same or like features of the invention.

**[0022]** For convenience of understanding, reference may be made to Figs. 1, 2 and 3 simultaneously. Figs. 1 and 2 illustrate a carton 10 having a handle structure in

accordance with a preferred embodiment of the invention. Fig. 3 illustrates the blank 12 from which the carton of Figs. 1 and 2 is formed

**[0023]** Fig. 2 illustrates the transverse alignment of cans C with respect to the carton's 10 handle structure in accordance with a preferred embodiment of the invention. Fig. 2 also depicts the manner in which the top wall of the carton 10 including its handle structure bows upwardly when a force F is applied to lift the strap member 14.

**[0024]** The environment of the handle structure of the invention is a carton 10 that forms an enclosure from a series of interconnected panels. In Fig. 3, the main adjoining panels 20, 22, 24, 26 and 28 which form a tubular structure when the end-most panels 20, 28 are joined are most clearly seen.

**[0025]** The end-most panels 20, 28 of the blank 12 form the top wall, or panel, of the carton 10 that contains the handle structure. For convenience of explanation, each portion of the top panel 20, 28 is further described in segments. Each half-panel has a strap member 46, 44 with a tapered region 30, 38 mediate the end regions. The remaining portion 40, 42 of the top panel lies along a side edge of the top panel. Flaps 80 adjoin the end edges of the top panel. Each flap 80 forms at least a portion of an end wall in the erected carton.

**[0026]** In the erected carton 10, the strap members 46, 44 overlap, to a certain extent, and the tapered regions 30, 38 overlap fully to produce a substantially reinforced handle. At the end regions of the strap handle members 46, 44 a web extends diagonally from the vertex of a side edge and an end edge of the panel.

**[0027]** The elongated webs 54 are defined by a spaced-apart pairing of a perforated line 57 extending diagonally from the aforementioned vertex and a score line 56 lying between the perforated line and the end edge of the panel 20, 28. The intersection of the score line 56 and perforated line 57 enhances the effectiveness of the invention.

**[0028]** A connecting member 70 conjoins the strap member 46, 44 and a portion of the region 42, 40 of the top panel adjacent the strap member 46, 44. Stress upon the end region of the handle structure is more evenly directed toward the ends of the handle structure and carton through the coincidence of a severance line segment, which in this embodiment consists of an edge 72 (appearing as a cut line in the blank 12) of the strap member 46, 44 with the score line 56 of the elongated web. Further enhancement of the operation of the handle structure is achieved by termination of the edge 72 at the connecting tab 70.

**[0029]** Optionally, the end regions of the top panel, which coincide with the end regions of the handle structure, may have an intermediate web panel 50 defined by a curved, or arcuate, score line 58, which, in the blank 12, coincides with the perforated lines 57 of the elongated webs of the handle structure. Another pair of intermediate web panels 60 may also be formed at the opposing side

of the carton.

**[0030]** The strap member 44, 46 provides a handle that directs stress toward the ends of the carton. The features of the handle structure which are described above cause the strap member 30, 38 and other elements upon the top panel of the carton to flex, or bow, in an outwardly-projecting predetermined manner when the carton 10 is lifted F. The structure of the elongated webs 54 cause the top panel 20, 28 to concavely bow in a stepped configuration, ascending inwardly, when the carton is lifted by a force, as illustrated in Fig. 2. The tapered strap member 30, 38 provides a convenient, reliable handle. The connecting tabs 70 interconnect the strap member 46, 44 and adjacent top panel regions 42, 40. This interconnection causes the top panel 20, 28 to maintain a more contiguous configuration when the carton is lifted. The side regions 42, 40 of the top panel have a tendency to flex away from the strap member. The connecting tabs inhibit such movement and promote a more pleasing appearance and greater integrity of the top panel of the carton.

**[0031]** The intermediate web panels 50, 60 enable the corners of the carton 10 to be drawn tighter when cans C or similar articles are transversely aligned in the carton with respect to the lengthwise dimension of the carton and top panel, as shown in Fig. 2.

**[0032]** The structure of the invention provides a handle that is reinforced and that directs stress away from the handle itself to the ends of the carton while helping the carton to maintain an aesthetically pleasing appearance and greater integrity when lifted.

**[0033]** Referring now simultaneously to Fig. 4 and Fig. 5, therein is shown a carton having an alternate preferred embodiment of handle structure in accordance with the teachings of the invention. In Figs. 4 and 5, features corresponding to like features of the preferred embodiment of the invention discussed above and illustrated in Figs. 1-3 are denoted by the same reference numerals but in a "100" series. For example, panel 24 in the first embodiment is denoted as 124 in the alternate preferred embodiment.

**[0034]** In the alternate embodiment of Figs. 4 and 5, a first corner web 200 is formed in each corner of the top wall in which the handle structure is formed by a perforated line 190 ("perforated" in that it consists of alternating cut segments and scored segments) and a first corner score line 191 convergingly extending from the corner of the top wall or panel toward the end edge of the strap member 144. The various "webs" in this alternate embodiment are also for convenience of explanation sometimes hereinafter alternately referred to as "gussets" and "pleats." The perforated line 190 intersects the proximate vertex of the top wall where a side edge and an end edge of the top wall intersect. The first corner score line 191 is disposed intermediate the perforated line 190 and the side edge of the top wall. A second corner score line 192 is disposed adjacent the first corner score line forming another web or gusset. A diagonal cut line 193 is dis-

posed at each corner of the side wall 122, 126 adjacent the top wall in coincident alignment with the first corner score line 191.

**[0035]** The severance line segment 172, which in this embodiment consists of a cut line 172 that defines each edge of the ends of the strap member may have many orientations but in the preferred alternate embodiment illustrated is optimally disposed in substantially parallel longitudinal alignment with the strap member and the side edges of the top wall.

**[0036]** Tabs 170 that serve as handle gussets (webs/pleats) are formed by tab score lines 194, 195. Although the tab score lines may have many different alignments with respect to one another, in the preferred alternate embodiment illustrated they are nonparallel. One of the tab score lines 195 is directed toward the handhole aperture. Each tab 170 is further defined by the cut lines 172 and 196 that define the edges of the strap member.

**[0037]** Referring now particularly to Fig. 5, the particular arrangement of elements of the handle structure of the alternate preferred embodiment described above and illustrated in Fig. 5 causes the top wall of the carton to deform in a controlled manner and direct stress in a predetermined manner. Referring momentarily particularly to Fig. 4, each cut line 172, 196 that separates the strap member structure from the remainder of the top wall and tabs 170, respectively, is interrupted by a nick member that provides joinder between these elements. As the strap member is lifted F, the nick members cause the strap member 144 and tabs 170 to become separated from one another and from the top wall in a predetermined manner such that the strap member is bowed outwardly and gussets 200, 202 and 204 become angularly displaced with respect to one another. Optimally, the first gusset 200 is displaced into condition inwardly of the outwardly-bowed strap member. The lifting force exerted upon the carton causes deformation which produces joinder between the diagonal cut lines and the first score lines. This deformation in turn causes the first gusset 200 to extend over the edge of the side wall of the carton. The arrangement of elements described directs stress to the corners of the carton. Further, when articles such as cans C are aligned in the carton, the enclosed cans at the corners of the carton adjacent the first gussets acts as a "beam" or bracing element.

**[0038]** In one optimum mode, as the strap member is lifted, the set of nicks connecting the strap member 144 and the tabs 170 break before the set of nicks connecting the strap member proximate the tabs 170 and the remainder of the top wall.

**[0039]** The primary elements of the handle structure of the subject invention are the strap member 30/38 & 130/138, disjoined from the handle panel 44/46 & 144/146, and what are referred to in this portion of the description as severance line segments 72 & 172. Each severance line segment extends between one point that is close to a corner of the handle panel and a second point that is close to the centrally disposed region of the

strap member. This arrangement produces a spring like relationship between the strap member and the handle panel such that when a force F is exerted upon a centrally disposed region of the strap handle in a direction substantially perpendicular to a plane (or notional plane) in which the handle panel lies, the strap member flexes outwardly of the plane to a biased position proximate the plane, as illustrated in Figs. 2 and 5. The arrangement of elements just described essentially creates a web inclusive of the pleat 70 & 170 which conjoins end regions of the strap member with the remainder of the handle panel. Stress due to the weight of the carton (and the offsetting force F use to lift and suspend the carton) is focused from the ends of the strap member toward the corners and end walls and adjacent side wall regions of the carton instead at undesirable regions of the handle panel and centrally disposed region of the strap member that are likely to tear and fail. The substantial separation of the centrally disposed region of the strap regions of the carton instead at undesirable regions of the handle panel and centrally disposed region of the strap member that are likely to tear and fail. The substantial separation of the centrally disposed region of the strap member from the plane of the handle panel helps facilitate dissipation of stress in the manner described above.

**[0040]** The severance line segments can be disposed in several optimal arrangements such as parallel to the side edges of the handle panel and diverging from the side panels as the severance line segment extends toward the end edges of the handle panel. In a carton in which cylindrical articles such as cans C are packaged, the end point of the severance line segment that is closest the corner optimally terminates at or near a tangent line T where the end can of the array of packaged cans is tangent to the handle panel.

**[0041]** Frangible members, or nick members, 74, 76 & 174, 176 are optimally disposed bridging the web that includes the pleats 70 & 170 and the strap member and bridging severance line segments 72 & 172, respectively, such that as a force that is substantially perpendicular to a notional plane of the handle panel is exerted upon the centrally disposed region of the strap member, the strap member flexes outwardly of the handle panel in a coordinated sequence beginning closest the centrally disposed region and progressing toward respective ones of the opposing edges.

**[0042]** The gussets 54 & 200 previously described above serve the same function as previously described. The gussets extend between the end point closest the corner to the corner itself. The gussets can be formed from a pair of score lines, a pair of perforated lines or a combination of a non-coincident pair of a score line and a perforated line. Modifications may be made in the foregoing without departing from the scope of the claimed invention.

## Claims

1. A handle structure for a carton having a handle panel (40,42; 140,142) and a strap member (44,46; 144,146) integrally conjoined with the handle panel (40,42;140,142), which strap member (44,46; 144,146) has strap edges substantially disjoined from the handle panel (40,42;140,142), **characterised by** comprising severance line segments (72; 172) extending from first end points proximate each respective corner of the handle panel (40,42; 140,142) to second end points proximate a centrally disposed region (30, 38;130,138) of said strap member (44,46;144,146) and in that a portion of each severance line segment defines a first edge of a respective connecting tab (70;170), and further in that additional severance lines extend from the centrally disposed region of the strap member to define second edges (196) of the connecting tabs opposite said first edges, the connecting tabs (70; 170) interconnecting the strap member (44, 46; 144, 146) and adjacent regions of the handle panel (40, 42), such that when a force that is substantially normal to a plane in which said handle panel lies is exerted upon said centrally disposed region (30, 38; 130, 138), said strap member (44, 46; 144, 146) is flexed outwardly of said plane to a biased position proximate said plane.
2. The handle structure as claimed in claim 1, wherein the aforesaid first edges of the connecting tabs (70, 170) are spaced from the aforesaid second edges (196) of the connecting tabs.
3. The handle structure as claimed in claim 1 or claim 2, wherein the aforesaid severance line segments (72, 172) remain unbroken until the strap member (44, 46; 144, 146) flexes outwardly of the aforesaid plane.
4. The handle structure as claimed in claims 1 to 3, wherein each said severance line segment (72; 172) comprises a portion that is substantially parallel to opposing side edges of the handle panel (40,42; 140,142).
5. The handle structure as claimed in claim 1, wherein a portion of each said severance line segment (72, 172) diverges from a proximate one of opposing side edges of the handle panel (40, 42; 140, 142) as the severance line segment (72, 172) extends from said second end point to said first end point.
6. The handle structure as claimed in any preceding claim, further comprising a gusset (54;154) formed from a non-coincident pair of a score line (56;156) and a perforated line (57;157) disposed at each of said corners and having a first end adjacent the re-

spective said corner and a second end adjacent said first end point of said severance line segment (72; 172).

7. The handle structure as claimed in any preceding claim, further comprising a plurality of first frangible members (74; 174) interconnecting said strap edges and adjacent portions of the handle panel (40,42; 140,142) disposed such that when a force exerted to the set up carton (10) that is substantially perpendicular to a notional plane of the handle panel (40,42; 140,142) is exerted upon said centrally disposed region (30,38;130,138) of said strap member, said strap member (44,46;144,146) flexes outwardly of the handle panel (40,42;140,142) in a coordinated sequence beginning closest said centrally disposed region (30,38;130,138) and progressing toward respective ones of opposing side edges of the handle panel.
8. The handle structure as claimed in any preceding claim further comprising a plurality of second frangible members (76; 176) bridging said severance line segments (72;172) and disposed such that when a force exerted to the set up carton (10) that is substantially perpendicular to a notional plane of the handle panel (40,42;140,142) is exerted upon said centrally disposed region of said strap member (44,46), said strap member (44,46;144,146) flexes outwardly of the handle panel (40,42;140,142) in a coordinated sequence beginning closest said centrally disposed region (30,38;130,138) and progressing toward respective ones of opposing side edges of the handle panel.
9. A carton having a handle structure as claimed in any one of the preceding claims.
10. A carton having a handle structure as claimed in claim 9, wherein an array of cylindrical articles (C) of a predetermined diameter are to be packaged within said carton (10) and said first end points lie on or adjacent a tangent line (T) at which the handle panel is tangent to a cylindrical sidewall of a body of one of the articles (C) disposed at the respective corner of the array adjacent the handle panel.
11. A blank for forming a carton having a plurality of wall panels for forming the top, base, opposing sides and ends of the carton and a handle structure comprising a handle panel (40,42;140,142) and a strap member (44,46;144,146) integrally conjoined with the handle panel (40,42; 140,142), which strap member (44,46; 144,146) has strap edges substantially disjoined from the handle panel (40,42;140,142), **characterised by** comprising severance line segments (72; 172) extending from first end points proximate each respective corner of the handle panel (40,42;

140,142) to second end points proximate a centrally disposed region (30,38;130,138) of said strap member (44,46;144,146) and in that a portion of each severance line segment defines a first edge of a respective connecting tab (70; 170), and further in that additional lines of severance extend from the centrally disposed region of the strap member to define second edges of the connecting tabs opposite said first edges, the connecting tabs (70;170) interconnecting the strap member (44, 46, 144, 146) and adjacent regions of the handle panel, such that when a force that is substantially normal to a plane in which said handle panel lies is exerted upon said centrally disposed region (30, 38; 130, 138), said strap member (44, 46; 144, 146) is flexed outwardly of said plane to a biased position proximate said plane.

12. The blank as claimed in claim 11, wherein each said severance line segment (72; 172) comprises a portion that is substantially parallel to opposing side edges of the handle panel (40,42; 140,142).
13. The blank as claimed in claim 11, wherein a portion of each said severance line segment diverges from a proximate one of opposing side edges of the handle panel (40,42;140,142) as said severance line segment (72;172) extends from said second end point to said first end point.
14. The blank as claimed in any of claims 11 to 13, further comprising a gusset (54;154) formed from a non-coincident pair of a score line (56;156) and a perforated line (57;157) disposed at each of said corners and having a first end adjacent the respective said corner and a second end adjacent said first end point of said severance line segment (72;172).

#### Patentansprüche

1. Griffstruktur für eine Schachtel, die eine Griff-Wandfläche (40, 42; 140, 142) aufweist und ein Streifenelement (44, 46; 144, 146), das integral mit der Griff-Wandfläche (40, 42; 140, 142) verbunden ist, wobei das Streifenelement (44, 46; 144, 146) Streifenkanten aufweist, die im Wesentlichen getrennt von der Griff-Wandfläche (40, 42; 140, 142) sind, **dadurch gekennzeichnet, dass** Bruchlinien-Segmente (72; 172) vorgesehen sind, die sich von ersten Endpunkten benachbart jeder entsprechenden Ecke der Griff-Wandfläche (40, 42; 140, 142) zu zweiten Endpunkten benachbart eines zentral angeordneten Bereichs (30, 38; 130, 138) des Streifenelements (44, 46; 144, 146) erstrecken, und **dadurch**, dass ein Abschnitt jedes Bruchlinien-Segments eine erste Kante einer entsprechenden Verbindungslasche (70; 170) definiert, und ferner **dadurch**, dass sich zusätzliche Bruchlinien von dem zentral angeordneten Bereich

- des Streifenelements erstrecken, um zweite Kanten (196) der Verbindungslaschen zu definieren, gegenüberliegend der ersten Kanten, wobei die Verbindungslaschen (70; 170) das Streifenelement (44, 46; 144, 146) und angrenzende Bereiche der Griff-Wandfläche (40, 42) verbinden, so dass, wenn eine Kraft, die im Wesentlichen normal zu einer Ebene ist, in welcher die Griff-Wandfläche liegt, auf den zentral angeordneten Bereich (30, 38; 130, 138) ausgeübt wird, das Streifenelement (44, 46; 144, 146) nach außen aus der Ebene zu einer vorgespannten Position benachbart der Ebene gebogen wird.
2. Griffstruktur nach Anspruch 1, wobei die oben genannten ersten Kanten der Verbindungslaschen (70; 170) beabstandet sind von den oben genannten zweiten Kanten (196) der Verbindungslaschen.
  3. Griffstruktur nach Anspruch 1 oder 2, wobei die oben genannten Bruchlinien-Segmente (72; 172) unverseht bleiben, bis das Streifenelement (44, 46; 144, 146) nach außen aus der oben genannten Ebene gebogen wird.
  4. Griffstruktur nach einem der Ansprüche 1 bis 3, wobei jedes Bruchlinien-Segment (72; 172) einen Abschnitt aufweist, der im Wesentlichen parallel zu gegenüberliegenden Seitenkanten der Griff-Wandfläche (40, 42; 140, 142) ist.
  5. Griffstruktur nach Anspruch 1, wobei ein Abschnitt von jedem Bruchlinien-Segment (72; 172) von einer benachbarten Seitenkante der gegenüberliegenden Seitenkanten der Griff-Wandfläche (40, 42; 140, 142) divergiert, wenn sich das Bruchlinien-Segment (72; 172) von dem zweiten Endpunkt zu dem ersten Endpunkt erstreckt.
  6. Griffstruktur nach einem der vorhergehenden Ansprüche, die ferner eine Verstärkung (54; 154) aufweist, die aus einem nicht-koinzidenten Paar von einer Kerb-Linie (56; 156) und einer perforierten Linie (57; 157) ausgebildet ist, an jeder der Ecken angeordnet, und ein erstes Ende, angrenzend an die jeweilige Ecke, und ein zweites Ende, angrenzend an den ersten Endpunkt des Bruchlinien-Segments (72; 172), aufweisend.
  7. Griffstruktur nach einem der vorhergehenden Ansprüche, die ferner eine Vielzahl von ersten abbrechbaren Elementen (74; 174) aufweist, die die Streifenkanten und angrenzende Abschnitte der Griff-Wandfläche (40, 42; 140, 142) verbinden, die derart angeordnet sind, dass dann, wenn eine Kraft auf die aufgerichtete Schachtel (10) ausgeübt wird, die im Wesentlichen senkrecht zu einer angenommenen Ebene der Griff-Wandfläche (40, 42; 140, 142) ist, und diese Kraft auf den zentral angeordneten Bereich (30, 38; 130, 138) des Streifenelements ausgeübt wird, sich das Streifenelement (44, 46; 144, 146) nach außen aus der Griff-Wandfläche (40, 42; 140, 142) in einer koordinierten Abfolge biegt, beginnend ganz nahe des zentral angeordneten Bereichs (30, 38; 130, 138) und fortschreitend hin zu jeweils einer der gegenüberliegenden Seitenkanten der Griff-Wandfläche.
  8. Griffstruktur nach einem der vorhergehenden Ansprüche, die ferner eine Vielzahl von zweiten abbrechbaren Elementen (76; 176) aufweist, die die Bruchlinien-Segmente (72; 172) überbrücken und die derart angeordnet sind, dass dann, wenn eine Kraft auf die aufgerichtete Schachtel (10) ausgeübt wird, die im Wesentlichen senkrecht zu einer angenommenen Ebene der Griff-Wandfläche (40, 42; 140, 142) ist, und diese Kraft auf den zentral angeordneten Bereich des Streifenelements (44, 46) ausgeübt wird, sich das Streifenelement (44, 46; 144, 146) nach außen aus der Griff-Wandfläche (40, 42; 140, 142) in einer koordinierten Abfolge biegt, beginnend ganz nahe des zentral angeordneten Bereichs (30, 38; 130, 138) und fortschreitend hin zu jeweils einer der gegenüberliegenden Seitenkanten der Griff-Wandfläche.
  9. Schachtel, die eine Griffstruktur nach einem der vorhergehenden Ansprüche aufweist.
  10. Schachtel, die eine Griffstruktur aufweist, nach Anspruch 9, wobei eine Anordnung von zylindrischen Artikeln (C) mit einem vorgegebenen Durchmesser in der Schachtel (10) verpackt werden sollen, und die ersten Endpunkte auf oder benachbart einer Tangentiallinie (T) liegen, an welcher die Griff-Wandfläche eine zylindrische Seitenwand eines Körpers von einem der Artikel (C) tangiert, der an der entsprechenden Ecke der Anordnung, benachbart der Griff-Wandfläche angeordnet ist.
  11. Zuschnitt zum Ausbilden einer Schachtel, der eine Vielzahl von Wandflächen zum Ausbilden der Decke, des Bodens, der gegenüberliegenden Seiten und der Enden der Schachtel aufweist und eine Griffstruktur, die eine Griff-Wandfläche (40, 42; 140, 142) aufweist und ein Streifenelement (44, 46; 144, 146), das integral mit der Griff-Wandfläche (40, 42; 140, 142) verbunden ist, wobei das Streifenelement (44, 46; 144, 146) Streifenkanten aufweist, die im Wesentlichen getrennt von der Griff-Wandfläche (40, 42; 140, 142) sind, **dadurch gekennzeichnet, dass** Bruchlinien-Segmente (72; 172) vorgesehen sind, die sich von ersten Endpunkten benachbart jeder entsprechenden Ecke der Griff-Wandfläche (40, 42; 140, 142) zu zweiten Endpunkten benachbart eines zentral angeordneten Bereichs (30, 38; 130, 138) des Streifenelements (44, 46; 144, 146) erstrecken,

und **dadurch**, dass ein Abschnitt jedes Bruchlinien-Segments eine erste Kante einer entsprechenden Verbindungslasche (70; 170) definiert, und ferner **dadurch**, dass sich zusätzliche Bruchlinien von dem zentral angeordneten Bereich des Streifenelements erstrecken, um zweite Kanten der Verbindungslaschen zu definieren, gegenüberliegend der ersten Kanten, wobei die Verbindungslaschen (70; 170) das Streifenelement (44, 46; 144, 146) und angrenzende Bereiche der Griff-Wandfläche verbinden, so dass, wenn eine Kraft, die im Wesentlichen normal zu einer Ebene ist, in welcher die Griff-Wandfläche liegt, auf den zentral angeordneten Bereich (30, 38; 130, 138) ausgeübt wird, das Streifenelement (44, 46; 144, 146) nach außen aus der Ebene zu einer vorgespannten Position benachbart der Ebene gebogen wird.

12. Zuschnitt nach Anspruch 11, wobei jedes Bruchlinien-Segment (72; 172) einen Abschnitt aufweist, der im Wesentlichen parallel zu gegenüberliegenden Seitenkanten der Griff-Wandfläche (40, 42; 140, 142) ist.
13. Zuschnitt nach Anspruch 11, wobei ein Abschnitt von jedem Bruchlinien-Segment von einer benachbarten Seitenkante von gegenüberliegenden Seitenkanten der Griff-Wandfläche (40, 42; 140, 142) divergiert, wenn sich das Bruchlinien-Segment (72; 172) von dem zweiten Endpunkt zu dem ersten Endpunkt erstreckt.
14. Zuschnitt nach einem der Ansprüche 11 bis 13, die ferner eine Verstärkung (54; 154) aufweist, die aus einem nicht-koinzidenten Paar von einer Kerb-Linie (56; 156) und einer perforierten Linie (57; 157) ausgebildet ist, an jeder der Ecken angeordnet, und ein erstes Ende, angrenzend an die jeweilige Ecke, und ein zweites Ende, angrenzend an den ersten Endpunkt des Bruchlinien-Segments (72; 172), aufweisend.

#### Revendications

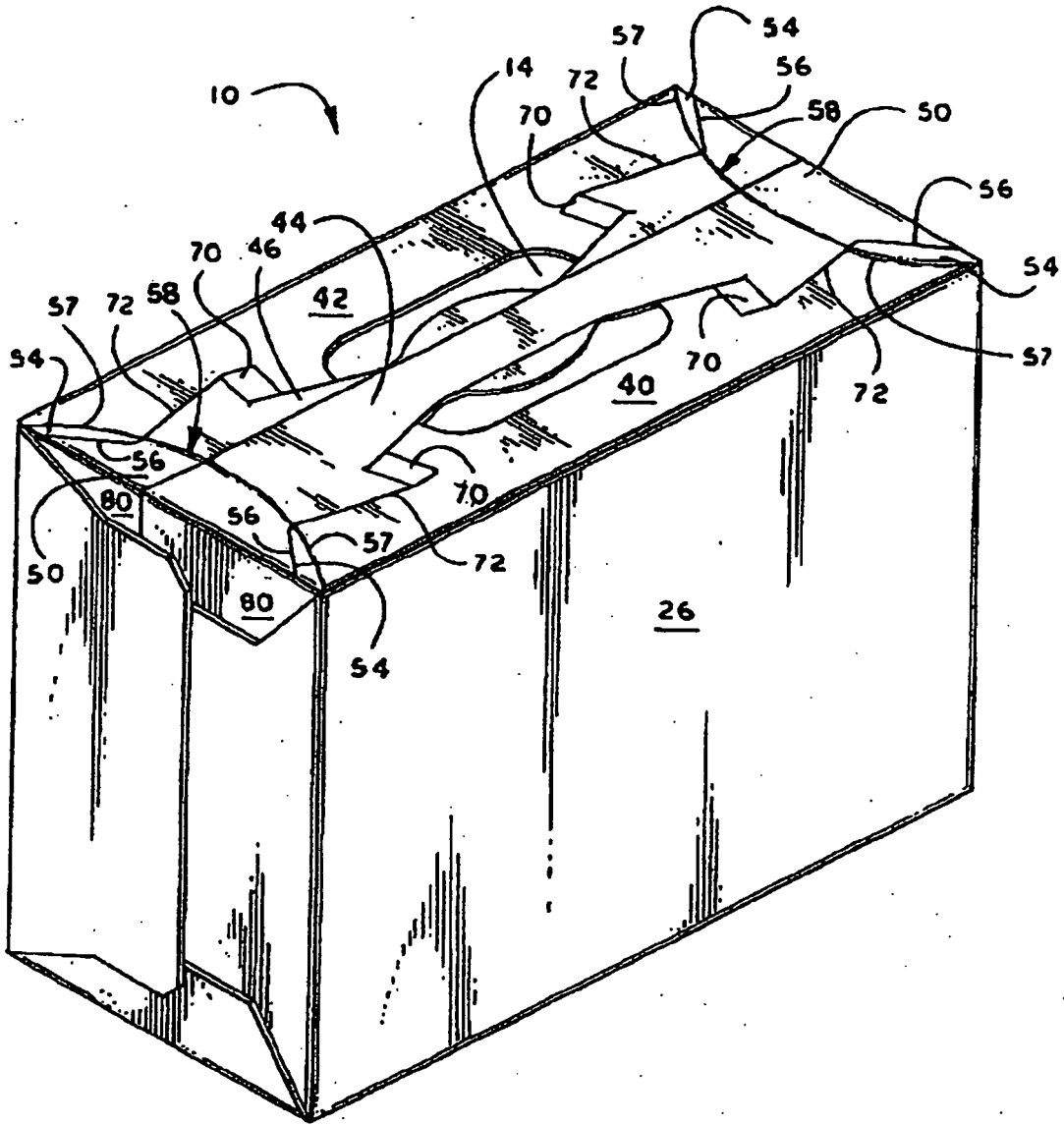
1. Structure de poignée destinée à un carton comportant un panneau formant poignée (40, 42; 140, 142) et un élément de liaison (44, 46; 144, 146) intégralement relié au panneau de poignée (40, 42; 140, 142), cet élément de liaison (44, 46; 144, 146) présente des bords de liaison essentiellement disjoints du panneau de poignée (40, 42; 140, 142), **caractérisée en ce qu'elle** comprend des segments de ligne de séparation (72; 172) s'étendant depuis les premiers points extrêmes à proximité de chaque coin respectif du panneau de poignée (40, 42; 140, 142) jusqu'aux seconds points extrêmes à proximité de la zone centrale (30, 38; 130, 138) de l'élément de

liaison (44, 46; 144, 146), et **en ce qu'une** partie de chaque segment de ligne de séparation délimite un premier bord d'une languette de raccordement respective (70; 170), et, en outre, **en ce que** des lignes de séparation supplémentaires s'étendent depuis la zone centrale de l'élément de liaison de manière à délimiter les seconds bords (196) des languettes de raccordement en regard desdits premiers bords, les languettes de raccordement (70; 170) reliant l'élément de liaison (44, 46; 144, 146) aux zones adjacentes du panneau de poignée (40, 42), de sorte que lorsqu'une force essentiellement normale à un plan dans lequel se situe ledit panneau de poignée s'exerce sur ladite zone centrale (30, 38; 130, 138), ledit élément de liaison (44, 46; 144, 146) se recourbe vers l'extérieur dudit plan vers une position de sollicitation à proximité dudit plan.

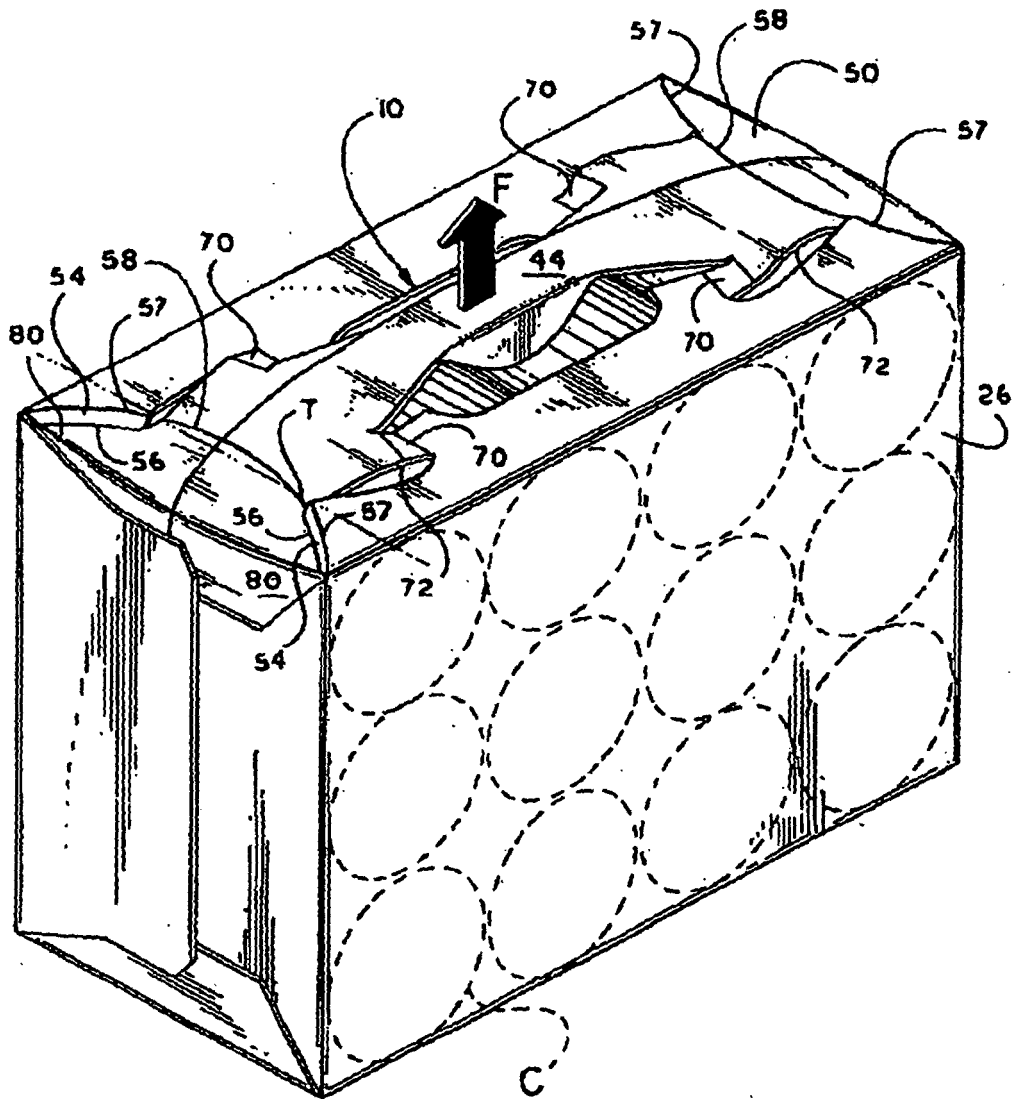
2. Structure de poignée telle que revendiquée dans la revendication 1, dans laquelle les susdits premiers bords des languettes de raccordement (70, 170) sont espacés par rapport aux susdits seconds bords (196) des languettes de raccordement.
3. Structure de poignée telle que revendiquée dans la revendication 1 ou la revendication 2, dans laquelle les susdits segments de ligne de séparation (72; 172) restent intacts jusqu'au moment de la flexion de l'élément de liaison (44, 46; 144, 146) vers l'extérieur du susdit plan.
4. Structure de poignée telle que revendiquée dans les revendications 1 à 3, dans laquelle chaque dit segment de ligne de séparation (72; 172) comporte une partie qui est essentiellement parallèle aux bords latéraux opposés du panneau de poignée (40, 42; 140, 142).
5. Structure de poignée telle que revendiquée dans la revendication 1, dans laquelle une partie de chaque dit segment de ligne de séparation (72; 172) diverge du bord immédiat des bords latéraux opposés du panneau de poignée (40, 42; 140, 142) alors que le segment de ligne de séparation (72; 172) s'étend depuis ledit second point extrême jusqu'audit premier point extrême.
6. Structure de poignée selon l'une quelconque des revendications précédentes, comprenant, en outre, un soufflet (54; 154) formé à partir de deux lignes de pliure (56; 156) non coïncidentes, ainsi qu'une ligne perforée (57; 157) disposée au niveau de chacun desdits coins et présentant une première extrémité contiguë audit coin respectif et une seconde extrémité contiguë audit premier point extrême dudit segment de ligne de séparation (72; 172).
7. Structure de poignée selon l'une quelconque des re-



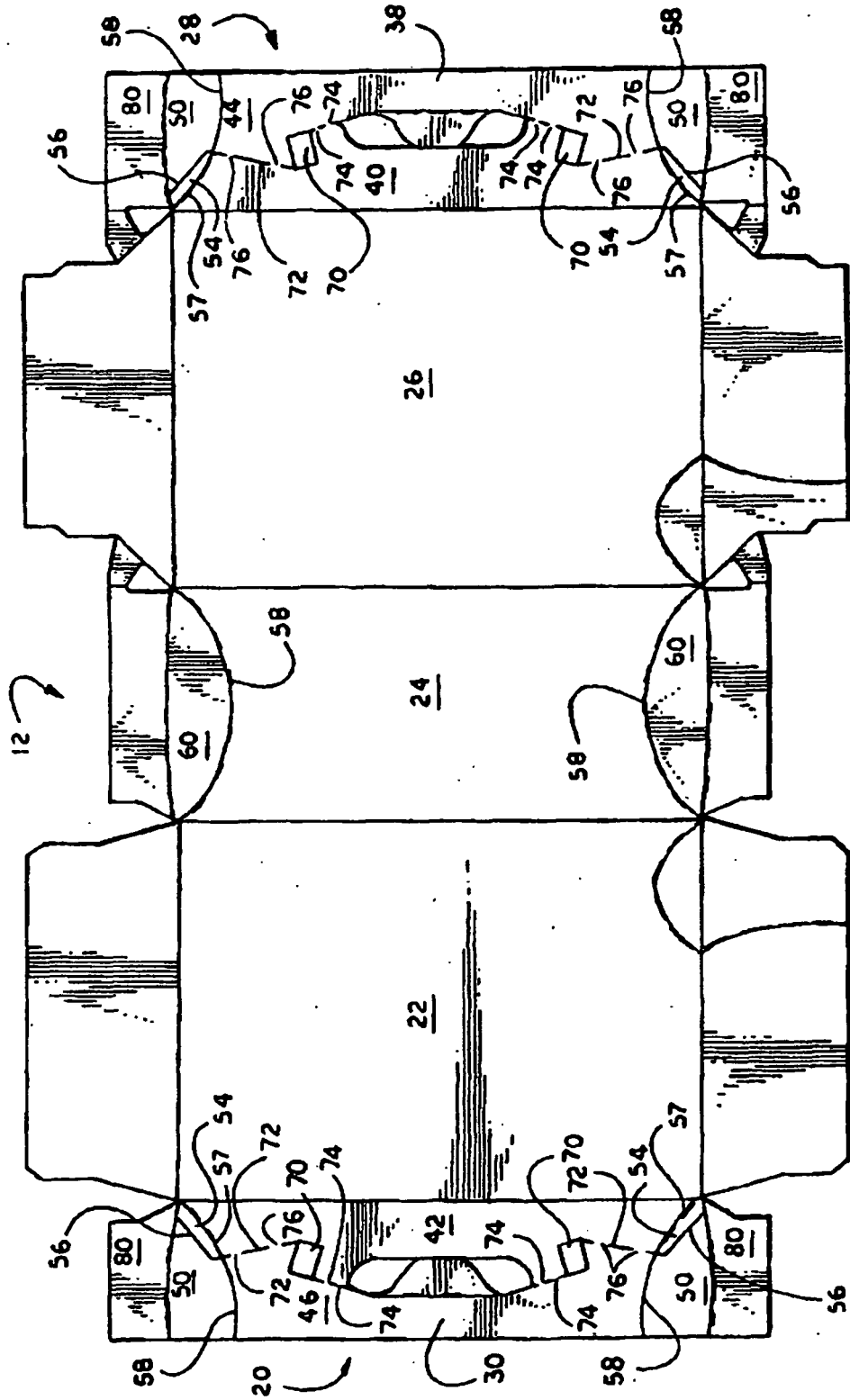
- vendications précédentes, comprenant en outre plusieurs premiers éléments frangibles (74; 174) reliant lesdits bords de liaison aux parties adjacentes du panneau de poignée (40, 42; 140, 142) disposé de sorte que lorsqu'une force, exercée au carton monté et essentiellement normale à un plan fictif du panneau de poignée (40, 42; 140, 142), s'exerce sur ladite zone centrale (30, 38; 130, 138) dudit élément de liaison, ledit élément de liaison (44, 46; 144, 146) se recourbe vers l'extérieur par rapport au panneau de poignée (40, 42; 140, 142) selon une séquence coordonnée commençant le plus près de ladite zone centrale (30, 38; 130, 138) et continuant vers les bords respectifs des bords latéraux opposés du panneau de poignée.
8. Structure de poignée selon l'une quelconque des revendications précédentes, comprenant en outre plusieurs éléments frangibles (76; 176) enjambant lesdits segments de ligne de séparation (72; 172) et disposés de sorte que lorsqu'une force, exercée au carton monté et essentiellement normale à un plan fictif du panneau de poignée (40, 42; 140, 142), s'exerce sur ladite zone centrale dudit élément de liaison (44, 46), ledit élément de liaison (44, 46; 144, 146) se recourbe vers l'extérieur du panneau de poignée (40, 42; 140, 142), selon une séquence coordonnée commençant le plus près de ladite zone centrale (30, 38; 130, 138) et continuant vers les bords respectifs des bords latéraux opposés du panneau de poignée.
9. Carton avec une structure de poignée tel que revendiqué dans l'une quelconque des revendications précédentes.
10. Carton avec une structure de poignée selon la revendication 9, dans lequel une série d'articles cylindriques (C) d'un diamètre prédéterminé doit être rangée dans ledit carton (10), et lesdits premiers points extrêmes se trouvent sur ou sont contigus à une ligne tangente (T) au niveau de laquelle le panneau de poignée est tangent à une paroi latérale cylindrique du corps de l'un des articles (C) disposés au coin respectif de la série attendant au panneau de poignée.
11. Flan destiné à former un carton présentant une pluralité de panneaux de paroi pour former le dessus, le fond, les côtés opposés et les extrémités du carton, ainsi qu'une structure de poignée comportant un panneau formant poignée (40, 42; 140, 142) et un élément de liaison (44, 46; 144, 146) intégralement relié au panneau de poignée (40, 42; 140, 142), cet élément de liaison (44, 46; 144, 146) présente des bords de liaison essentiellement disjoints du panneau de poignée (40, 42; 140, 142), **caractérisé en ce qu'il** comprend des segments de ligne de séparation (72; 172) s'étendant depuis des premiers points extrêmes à proximité de chaque coin respectif du panneau de poignée (40, 42; 140, 142) jusqu'aux seconds points extrêmes à proximité de la zone centrale (30, 38; 130, 138) de l'élément de liaison (44, 46; 144, 146), et **en ce qu'**une partie de chaque segment de ligne de séparation délimite un premier bord d'une languette de raccordement respective (70; 170), et, en outre, **en ce que** des lignes de séparation supplémentaires s'étendent depuis la zone centrale de l'élément de liaison de manière à délimiter les seconds bords des languettes de raccordement en regard desdits premiers bords, les languettes de raccordement (70; 170) reliant l'élément de liaison (44, 46; 144, 146) aux zones adjacentes du panneau de poignée (40, 42), de sorte que lorsqu'une force essentiellement normale à un plan dans lequel se situe ledit panneau de poignée s'exerce sur ladite zone centrale (30, 38; 130, 138), ledit élément de liaison (44, 46; 144, 146) se recourbe vers l'extérieur dudit plan vers une position de sollicitation à proximité dudit plan.
12. Flan tel que revendiqué dans la revendication 11, dans lequel chaque dit segment de ligne de séparation (72; 172) comprend une partie essentiellement parallèle aux bords latéraux opposés du panneau de poignée (40, 42; 140, 142).
13. Flan tel que revendiqué dans la revendication 11, dans lequel une partie de chaque dit segment de ligne de séparation diverge du bord immédiat des bords latéraux opposés du panneau de poignée (40, 42; 140, 142) alors que ledit segment de ligne de séparation (72; 172) s'étend depuis ledit second point extrême jusqu'au premier point extrême.
14. Flan tel que revendiqué dans l'une quelconque des revendications 11 à 13, comprenant en outre un soufflet (54; 154) formé à partir de deux lignes de pliure (56; 156) non coïncidentes et une ligne perforée (57; 157) située au niveau de chacun desdits coins et présentant une première extrémité contiguë audit coin respectif, ainsi qu'une seconde extrémité contiguë audit premier point extrême dudit segment de ligne de séparation (72; 172).



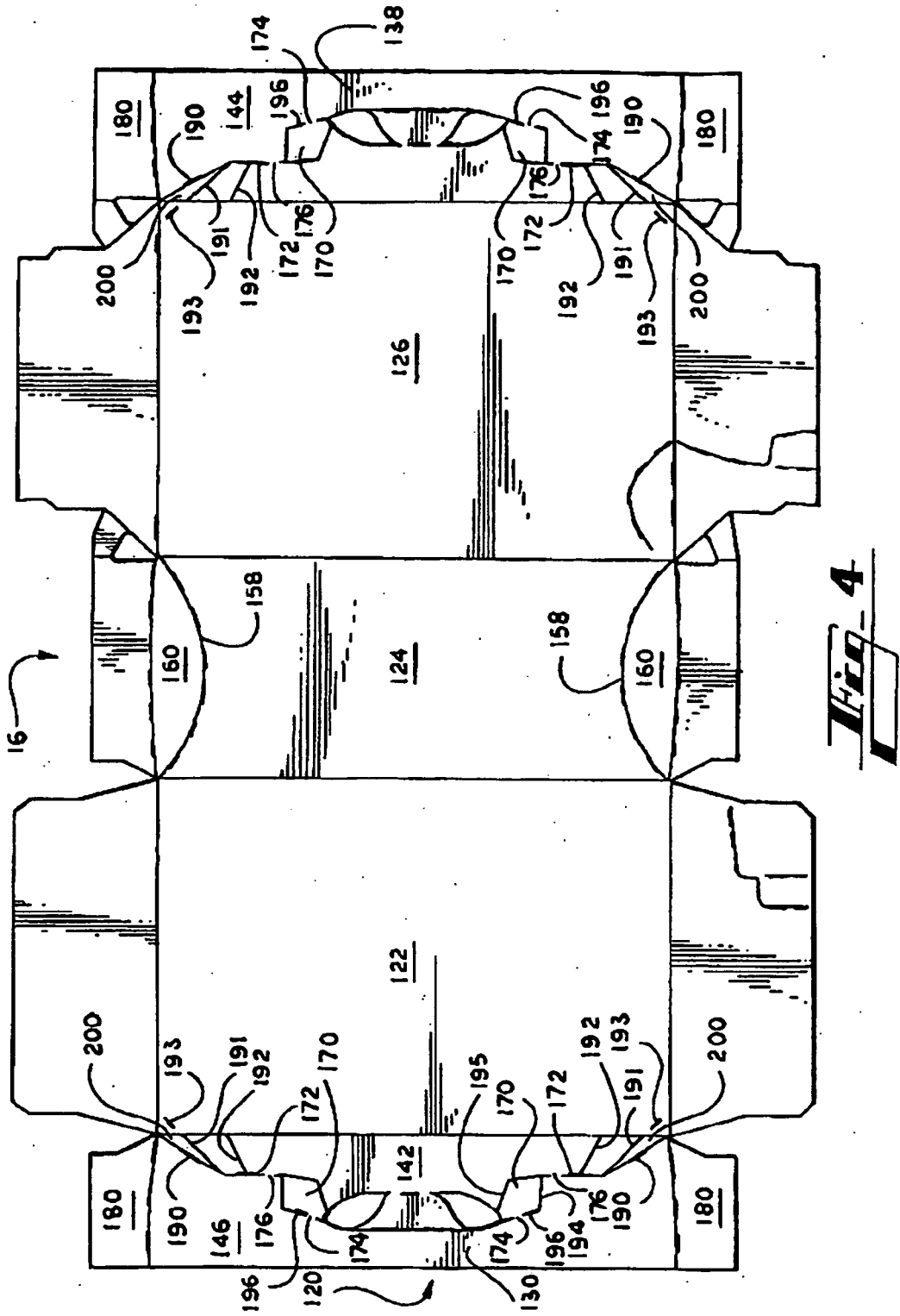
**Fig. 1**

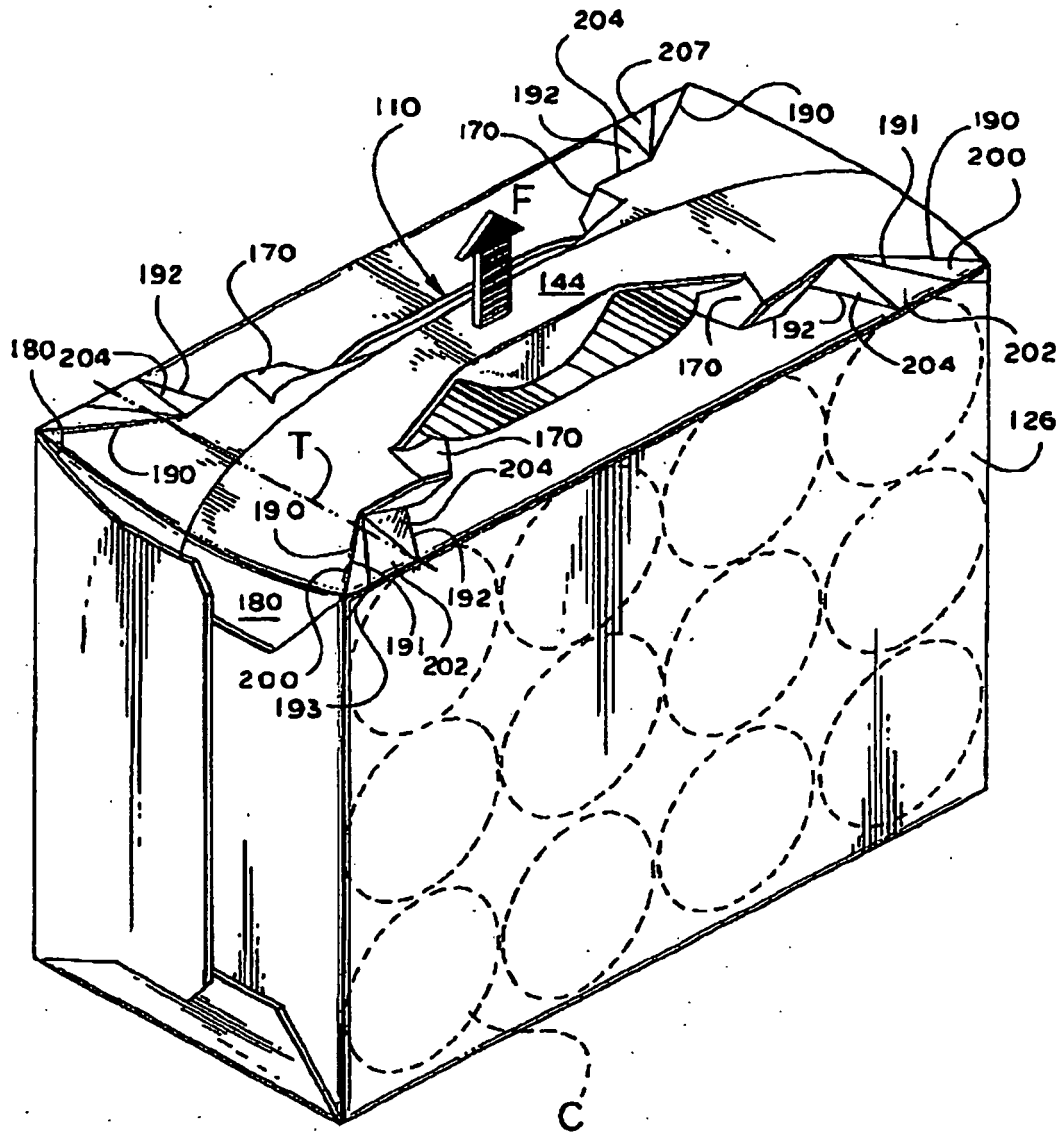


**Fig. 2**



**Fig. 3**





**Fig. 5**

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- US 5873515 A [0004]