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(54) **Transport and display container**

Transport- und Schaustellungsbehälter

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Description

[0001] The present invention relates to containers and in particular to containers that are configured to be easily transformed from a transport/transit configuration to a display configuration. Such containers are sometimes referred to as transit and display containers and may take the form of a closed box or an open topped tray, for example.

[0002] When presented on a shelf in their display state, transit and display containers are often required to have an opening in one of their side walls, usually at least in the front wall, to enable customers to see and access the goods in the display container. Providing apertures in the walls of a container, however, reduces the overall stability of the container. This can be problematic, for example during transport and storage of the container, where large vertical forces are applied to the container when similar containers are stacked.

[0003] Known transit and display containers attempt to improve container stability by incorporating sections in the container walls that can be removed for display purposes. These removable sections lend additional stability to the container walls during transport. In known containers such removable sections are defined by lines of weakness. Such lines of weakness, for example lines of perforation, need to be strong enough to retain their integrity when the container is erected from a blank and during filling, transport and storage of the container. Conversely, lines of weakness need to be designed so as not to provide a resistance to the removal of a removable section of a container that would prevent removal of the removable section by a user, such as for example by a person arranging the container on a shelf of a shop or supermarket.

[0004] US 5 657 872 discloses a container according to the preamble of claim 1. NL 1021377 and US 6105857 disclose containers having removeable portions for forming openings.

[0005] It is an object of the present invention to overcome or mitigate some or all of the above disadvantages of conventional transit and display containers.

[0006] From an aspect of the present invention there is provided a container as claimed in claim 1.

[0007] Such an arrangement permits the use of lines of weakness that are relatively weaker than lines of weakness provided on a comparable panel in which the lines of weakness do not define a form-interlocking engagement. The connection provided by the present invention does not solely rely on bridging material for structural integrity but further makes use of form-interlocking for improving stability.

[0008] Preferably the line of weakness is wave-like or zig-zag shaped.

[0009] Preferably form-interlocking is provided in a direction in which a main loading force is likely to be exerted onto the container, for example in the vertical direction in the case of stacking and/or lifting forces. When this main load force, or part thereof, is exerted onto the removable section, then the removable section is still prevented from separating from the remainder of the panel due to the form-interlocking of the removable section with the remainder of the panel. Thus, stacking forces transmitted onto the removable section, for example through a lid connected to the removable section, or lifting forces applied to such a lid may not cause separation of the removable section from the remainder of the panel.

[0010] Preferably, the line of weakness substantially extends within the range of 0 degrees to about 35 degrees relative to the direction of main force application.

[0011] Separation of the removable section from the remainder of the container is achieved by applying a force in a direction in which no form-interlocking occurs to the removable section, i.e. a direction comprising a component orthogonal to the plane defined by the removable section, that is out of plane movement relative to a remainder of said panel.

[0012] It will be appreciated that removable sections that form-interlock in a container panel present resistance to removal from the panel even after the line of weakness defining the removable section has been ruptured. The removable section may therefore advantageously be used to lock container structures connected to it in place. The removable section is connected to the container lid.

[0013] In this arrangement, the removable section can advantageously be separated from the remainder of the container as one piece with the lid in a single procedural step. The part of the lid connected to the removable section is a hinged flap moveable in a direction that has a component orthogonal to the plane defined by the removable section. Hinged movement of this flap can therefore cause separation of the separable region from the remainder of the container.

[0014] Preferably the hingeable flap portion is defined by one or more lines of weakness within the lid.

Preferably a or the lines of weakness extend from an edge of a panel.

[0015] A further or second removable section is preferably also provided, most preferably in a wall opposite to a side wall comprising a first removable section.

[0016] When wave-like or zig-zag shaped lines of weakness are provided, the spacing between adjacent peaks or between adjacent troughs of said wave-like or zig-zag pattern is preferably between 15 mm and 150 mm, more preferably between 15 mm and 40 mm. The maximum spacing of the peaks or troughs is, however, also determined by the total length of the line of weakness as it is required that at least one peak or trough be provided so as to ensure that the line of weakness provides form-interlocking.

[0017] The peak to trough amplitude of said wave-like or zig-zag pattern is between 4 mm and 90 mm and more preferably between 4 mm and 15 mm. When providing wave-like or zig-zag pattern care needs to be taken that a peak to trough amplitude is chosen that ensures form-

interlocking between the removable section and the remainder of the container. It will be appreciated that the decision on which peak to trough amplitudes to choose depends on a number of factors, including the chosen peak/trough spacing of the line of weakness and the direction in which the main load force acting on the removable section is likely to be applied. For example, in containers where a line of weakness extends at a shallow angle relative to the direction of the main load force (such as a vertical compressing force resulting from stacking of several containers) the peak to trough amplitude of the line of weakness does not need to be as large as the peak to trough amplitude of a line of weakness that extends in a direction that is at a larger angle relative to the main load force. As a further example, a line of weakness having a large peak/trough spacing or pitch may require large peak to trough amplitudes to provide the desired form-interlocking, whereas lines of weakness with a small pitch can be provided with a smaller peak to trough amplitude to provide form-interlocking. This relationship between amplitude and pitch can be expressed in terms of the ratio between amplitude and pitch, which preferably is within the range of 0.10 to 1.5 and more preferably between 0.3 and 0.8.

[0018] Various embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

Figure 1-1 shows a blank for a base according to a preferred embodiment;
Figure 1-2 shows a preferred base erected from a blank as shown in Fig. 1-1;
Figure 1-3 shows a blank for a lid according to a preferred embodiment;
Figure 1-4 shows a preferred lid erected from a blank as shown in Fig. 1-3;
Figure 1-5 shows a readily assembled container with the lid shown in Fig. 1-4 placed on the base shown in Fig. 1-2;
Figure 1-6 shows an opening step of the container shown in Fig. 1-5;
Figure 1-7 shows a display tray obtained from the container of Fig. 1-5 after opening;
Figure 2-1 shows an blank for a container according to another embodiment of the present invention; and
Figure 2-2 shows a preferred container erected from the blank shown in Fig. 2-1.

[0019] Figure 1-1 shows a blank 2 for erecting into a base of a container according to a preferred embodiment. The blank 2 comprises a panel 4 that, in the erected state, forms the bottom of the container. Further provided are panels 6 and 8 that, in the erected state, form two of the side walls of the container. Lines of weakness 10, 12, 14 and 16 extend from outer edges 18 and 20 of panels 6 and 8 to apertures 22 and 24 respectively, defining areas 26 and 28. Lines of weakness 10 and 14 extend in a general direction that has an angle of about 15 degrees relative to the direction orthogonal to edges 18 and 20 respectively and lines of weakness 12 and 16 extend in a general direction that has an angle of about 10 degrees relative to the direction orthogonal to edges 18 and 20 respectively. Areas 26 and 28 are accordingly wider at the top edges 18 and 20 than at the end proximate to apertures 22 and 24. Good access to the interior of the container once erected and opened is accordingly provided by the preferred embodiment. The wave-like pattern of lines of weakness 10, 12, 14 and 16 have a peak to trough amplitude of 12.6 mm and a peak to peak spacing of about 38.6 mm.

[0020] Panels 30, 32, 34 and 36 are provided for forming vertical support columns in the corners of the base in the erected state. Fig. 1-2 shows a preferred base 38 erected from a blank as shown in Fig. 1-1.

[0021] It can be appreciated from Fig. 1-1, that areas 26 and 28 cannot be removed from panels 6 and 8 respectively by movement of areas 26 and 28 in the plane of panels 6 and 8, as lines of weakness 10, 12, 14 and 16 are arranged so that such in-plane movement simply causes interlocking between adjacent edges of areas 26 and 28 and panels 6 and 8 respectively.

[0022] Fig. 1-3 shows a blank 40 for erecting in a lid of a preferred container. The blank 40 comprises a panel 42 that, in the erected state, forms the top of the lid. Further provided are panels 44 and 46 that, in the erected state, form two of the side walls of the lid. Lines of weakness 48, 50, 52 and 54 divide panels 44 and 46 into areas 56, 58, 60, 62, 64 and 66 respectively. Fig. 1-4 shows a preferred lid 68 erected from a blank as shown in Fig. 1-3.

[0023] In use, base 34 is erected from blank 2 and subsequently filled with goods. Adhesive is then applied to areas 26 and 28 prior to placement of lid 68 on base 34, as shown in Fig. 1-5. In the fully assembled state, lid 68 is accordingly connected to base 34 via areas 26 and 28.

[0024] When opening container 70, areas 58 and 64 of lid 68 are hinged outwardly as is shown in Fig. 1-6, so as to break lines of weakness 48, 50, 52 and 54 respectively. This outward movement of areas 58 and 64 also causes a breaking of lines of weakness 10, 12, 14 and 16 on panels 6 and 8 of base 34 as areas 58 and 64 are permanently attached to areas 26 and 28. After lines of weakness 10, 12, 14 and 16 have been broken, lid 68 can easily be removed from base 34 in a simple upward movement, thus transforming container 70 into its display state as shown in Fig. 1-7. As can be seen from Fig. 1-7, separating areas 26 and 28 from panels 6 and 8 has created edges 72, 74, 76 and 78 on panels 6 and 8. As will be appreciated, areas 26 and 26 comprise edges (not shown) complementing edges 72, 74, 76 and 78 of panels 6 and 8. Areas 26 and 28 of base 34 remain attached to areas 58 and 64 of lid 68.

[0025] To close base 38 again, lid 68 is simply placed on base 38. Subsequently, areas 58 and 64 are moved downwardly so that areas 26 and 28 come to lie in the area defined by edges 72, 74, 76 and 78. It will be ap-

preciated, that, once lid 68 has been reconnected to base 38 in this manner, upward movement of lid 68 relative to base 38 is impeded, as the sides of the wave shaped edges of areas 26 and 28 interfere with the sides of the wave shaped edges of panels 6 and 8 of the base 38 when areas 26 and 28 are moved in a direction that is in the plane of panels 6 and 8. Thus lid 38 is securely held on container 70 until areas 58 and 64 are hinged outwardly again.

[0026] The preferred container accordingly permits reclosing. When stacking re-closed preferred containers outward movement of side walls 6 and 8 due to vertical pressure is prevented by a holding force applied onto side walls 6 and 8 by areas 56, 60, 62 and 66 of lid 68. Lid 68 is furthermore securely held in place against vertical movement during handling. It will further be appreciated that, even in a state where lines of weakness 10, 12, 14 and 16 have been broken, the presence of areas 26 and 28 in panels 6 and 8 improves the stability of container's 70 resistance to crushing forces is improved through the interlocking between areas 26 and 28 and the remainders of panels 6 and 8 respectively.

[0027] Fig. 2-1 shows a further preferred embodiment of a blank 100 for erecting into a container. The blank 100 comprises a panel 102 that in the erected state forms the bottom of the container. Further provided are panels 104 and 106 for forming container side walls in the erected state. Lines of weakness 108, 110, 112 and 114 extend from edges 116 and 118 of panels 104 and 106 respectively towards finger holes 120 and 122 and define removable areas 124 and 126.

[0028] As can be seen from Fig. 2-1, the sections of the lines of weakness 108, 110, 112 and 114 extending in a direction substantially orthogonal to edges 116 and 118 respectively comprise one period of a sinusoid. The peak defined by these sinusoids on areas 124 and 126 (such as for example peak 128 as indicated in Fig. 2-1) are inside corresponding troughs defined by the same sinusoids on the remainders of panels 104 and 106 respectively. It will be appreciated that this arrangement causes interference between these peaks and troughs when separation of areas 124 and 126 respectively from panels 104 and 106 is attempted, when the separation force is in a direction in the plane of the panels 104 and 106. Thus, to separate areas 124 and 126 from panels 104 and 106 respectively, a separation force that is orthogonal to the plane defined by panels 104 and 106 needs to be applied.

[0029] Fig. 2-2 shows a container 140 erected from blank 100 shown in Fig. 2-1. A lid is adhered to areas 124 and 126, thus securing the lid to the container 140. To remove the lid from the container 140, a user can insert his or her fingers into the finger holes 120 and 122 respectively and apply an outwardly pulling force to areas 124 and 126 and to the parts of the lid connected to these areas 124 and 126, so as to cause breaking of lines of weakness 108, 110, 112 and 114.

[0030] After removal of the lid, the lid can be re-placed on container 140 and secured to container 140 by reinserting areas 124 and 126 into the openings left by their previous removal. Form-interlocking between the peaks and troughs defined by the sinusoid again ensure secure holding of the lid on container 140.

[0031] Although the present invention has been described with reference to preferred embodiments, it will be understood by those skilled in the art that many changes in form and detail may be made without departing from the scope of the invention as set forth in the accompanying claims. The line of weakness defined in a side wall of the base may further form an area of any shape that permits preventing separation of the lid from the base when the area is re-inserted into the spaced left by separation from the area. For example, the line of weakness may define a trapezoidal area having a top edge that is shorter than the bottom edge, so that upward movement of the area and the lid is impeded.

[0032] An arrangement in which the area of the side wall that interlocks with the remainder of the side wall is not initially connected to the side wall along a line of weakness is also contemplated.

Claims

1. A container comprising a lid (68) and a base (34), a hingeable flap portion (58,64) of said lid being attached to a removable section (26,28) of said base, wherein hinged movement of said flap portion (58,64) in a direction that has a component orthogonal to a plane defined by said removable section (26,28) causes separation of said removable section from a remainder of said base;
   wherein said base comprises a panel (6,8) with a line of weakness (10-16) at least partly defining the removable section (26,28);
   wherein the removable section (26,28) extends from an edge (18,20) of the panel (6,8);
   characterised in that said removable section (26,28) is form interlocking with a remainder of said panel (6,8) such that in-plane movement of said removable section (26,28) causes interlocking between adjacent edges of said removable section and the remainder of the panel (6,8).

2. A container as claimed in claim 1, wherein the line of weakness (10-16) is wave-like or zig-zag shaped.

3. A container as claimed in claim 2, wherein the spacing between adjacent peaks or between adjacent troughs of said wave-like or zig-zag pattern is between 15 mm and 150 mm.

4. A container as claimed in claim 3, wherein the spacing between adjacent peaks or between adjacent troughs of said wave-like or zig-zag pattern is between 15 mm and 40 mm.

5. A container as claimed in claims 2, 3 or 4, wherein the peak to trough amplitude of said wave-like or zig-zag pattern is between 4 mm and 90 mm.

6. A container as claimed in claim 5, wherein the peak to trough amplitude of said wave-like or zig-zag pattern is between 4 mm and 15 mm.

7. A container as claimed in any of claims 2 to 6, wherein the ratio between amplitude and pitch of said wave-like or zig-zag pattern is within the range of 0.10 to 1.5.

8. A container as claimed claim 7, wherein the ratio between amplitude and pitch of said wave-like or zig-zag pattern is within the range of 0.3 to 0.8.

9. A container as claimed in any preceding claim, wherein said form-interlocking is provided in the vertical direction.

10. A container as claimed in any preceding claim, wherein said line of weakness substantially extends within the range of 0 degrees to 35 degrees relative to the direction of a known loading force, wherein said direction of said known loading force is the vertical direction.

11. A container as claimed in any preceding claim, wherein said hingeable flap portion (58,64) is defined by one or more lines of weakness (50-56).

12. A container as claimed in claim 11, wherein said flap portion line or lines of weakness (50-56) extends from an edge.

13. A container as claimed in any preceding claim, further comprising a second removable section (26,28).

14. A container as claimed in claim 13, wherein said second removable section (26,28) is provided in a wall opposite to a side wall comprising said removable section (26,28).

Patentansprüche

1. Behälter, aufnehmend einen Deckel (68) und eine Basis (34), wobei ein schwenkbarer Klappenteil (58, 64) des Deckels an einem entfernbaren Abschnitt (26, 28) der Basis angebracht ist, wobei eine Schwenkbewegung des Klappenteils (58, 64) in einer Richtung, die eine Komponente orthogonal zu einer Ebene hat, die durch den entfernbaren Abschnitt (26, 28) definiert ist, eine Trennung des entfernbaren Abschnitts von einem Rest der Basis bewirkt;
wobei die Basis eine Platte (6, 8) mit einer Schwächungslinie (10-16) aufweist, die wenigstens teilweise den entfernbaren Abschnitt (26, 28) definiert;
wobei sich der entfernbare Abschnitt (26, 28) von einer Kante (18, 20) der Platte (6, 8) erstreckt;
dadurch gekennzeichnet, dass der entfernbare Abschnitt (26, 28) mit einem Rest der Platte (6, 8) formschlüssig ist, derart dass eine In-Ebene-Bewegung des entfernbaren Abschnitts (26, 28) ein Ineinandergreifen zwischen benachbarten Kanten des entfernbaren Abschnitts und des Rests der Platte (6, 8) bewirkt.

2. Behälter nach Anspruch 1, wobei die Schwächungslinie (10-16) wellenartig oder zickzack geformt ist.

3. Behälter nach Anspruch 2, wobei der Abstand zwischen benachbarten Spitzen oder zwischen benachbarten Mulden des wellenartigen oder zickzack Musters zwischen 15 mm und 150 mm beträgt.

4. Behälter nach Anspruch 3, wobei der Abstand zwischen benachbarten Spitzen oder zwischen benachbarten Mulden des wellenartigen oder zickzack Musters zwischen 15 mm und 40 mm beträgt.

5. Behälter nach einem der Ansprüche 2, 3 oder 4, wobei die Spitze-zu-Mulde-Amplitude des wellenartigen oder zickzack Musters zwischen 4 mm und 90 mm beträgt.

6. Behälter nach Anspruch 5, wobei die Spitze-zu-Mulde-Amplitude des wellenartigen oder zickzack Musters zwischen 4 mm und 15 mm beträgt.

7. Behälter nach irgendeinem der Ansprüche 2 bis 6, wobei das Verhältnis zwischen der Amplitude und dem Abstandsmaß des wellenartigen oder zickzack Musters innerhalb eines Bereiches von 0,10 bis 1,5 liegt.

8. Behälter nach Anspruch 7, wobei das Verhältnis zwischen der Amplitude und dem Abstandsmaß des wellenartigen oder zickzack Musters innerhalb eines Bereiches von 0,3 bis 0,8 liegt.

9. Behälter nach irgendeinem der vorangehenden Ansprüche, wobei die Formschlüssigkeit in vertikaler Richtung vorgesehen ist.

10. Behälter nach irgendeinem der vorangehenden Ansprüche, wobei die Schwächungslinie im Wesentlichen innerhalb eines Bereiches von 0 Grad bis 35 Grad relativ zu der Richtung einer bekannten Belastungskraft verläuft, wobei die Richtung der bekannten Belastungskraft die vertikale Richtung ist.

11. Behälter nach irgendeinem der vorangehenden Ansprüche, wobei der schwenkbare Klappenteil (58,

64) durch eine oder mehrere Schwächungslinien (50-56) definiert ist.

12. Behälter nach Anspruch 11, wobei sich die Schwächungslinie oder die Schwächungslinien (50-56) des Klappenteils von einer Kante erstrecken.

13. Behälter nach irgendeinem der vorangehenden Ansprüche, ferner aufweisend einen zweiten entfernbaren Abschnitt (26, 28).

14. Behälter nach Anspruch 13, wobei der zweite entfernbare Abschnitt (26, 28) in einer Wand gegenüberliegend einer den entfernbaren Abschnitt (26, 28) aufweisenden Seitenwand vorgesehen ist.

Revendications

1. Conteneur comportant un couvercle (68) et une base (34), une partie de rabat pouvant être articulée (58, 64) dudit couvercle étant fixée sur une section amovible (26, 28) de ladite base, un mouvement articulé de ladite partie de rabat (58, 64) dans une direction qui a une composante perpendiculaire à un plan défini par ladite section amovible (26, 28) provoquant une séparation de ladite section amovible d'un reste de ladite base ;
la ladite base comportant un panneau (6, 8) avec une ligne de faiblesse (10 à 16) définissant au moins en partie la section amovible (26, 28) ;
la section amovible (26, 28) s'étendant depuis un bord (18, 20) du panneau (6, 8) ;
caractérisé en ce que ladite section amovible (26, 28) est une forme se bloquant avec un reste dudit panneau (6, 8) de telle sorte qu'un mouvement dans le plan de ladite section amovible (26, 28) provoque un blocage entre des bords adjacents de ladite section amovible et le reste du panneau (6, 8).

2. Conteneur selon la revendication 1, dans lequel la ligne de faiblesse (10 à 16) est d'une forme ondulée ou en zigzag.

3. Conteneur selon la revendication 2, dans lequel l'espacement entre des crêtes adjacentes ou entre des creux adjacents dudit dessin ondulé ou en zigzag est entre 15 mm et 150 mm.

4. Conteneur selon la revendication 3, dans lequel l'espacement entre des crêtes adjacentes ou entre des creux adjacents dudit modèle ondulé ou en zigzag est entre 15 mm et 40 mm.

5. Conteneur selon les revendications 2, 3 ou 4, dans lequel l'amplitude de crête à creux dudit modèle ondulé ou en zigzag est entre 4 mm et 90 mm.

6. Conteneur selon la revendication 5, dans lequel l'amplitude de crête à creux dudit modèle ondulé ou en zigzag est entre 4 mm et 15 mm.

7. Conteneur selon l'une quelconque des revendications 2 à 6, dans lequel le rapport entre l'amplitude et le pas dudit modèle ondulé ou en zigzag est dans la plage de 0,10 à 1,5.

8. Conteneur selon la revendication 7, dans lequel le rapport entre l'amplitude et le pas dudit modèle ondulé ou en zigzag est dans la plage de 0,3 à 0,8.

9. Conteneur selon l'une quelconque des revendications précédentes, dans lequel ledit blocage de forme est prévu dans la direction verticale.

10. Conteneur selon l'une quelconque des revendications précédentes, dans lequel ladite ligne de faiblesse s'étend sensiblement dans la plage de 0 degrés à 35 degrés par rapport à la direction d'une force de chargement connue, ladite direction de ladite force de chargement connue étant la direction verticale.

11. Conteneur selon l'une quelconque des revendications précédentes, dans lequel ladite partie de rabat pouvant être articulée (58, 64) est définie par une ou plusieurs lignes de faiblesse (50 à 56).

12. Conteneur selon la revendication 11, dans lequel ladite ligne de partie de rabat ou lesdites lignes de faiblesse (50 à 56) s'étendent depuis un bord.

13. Conteneur selon l'une quelconque des revendications précédentes, comportant en outre une deuxième section amovible (26, 28).

14. Conteneur selon la revendication 13, dans lequel ladite deuxième section amovible (26, 28) est prévue dans une paroi opposée à une paroi latérale comportant ladite section amovible (26, 28).

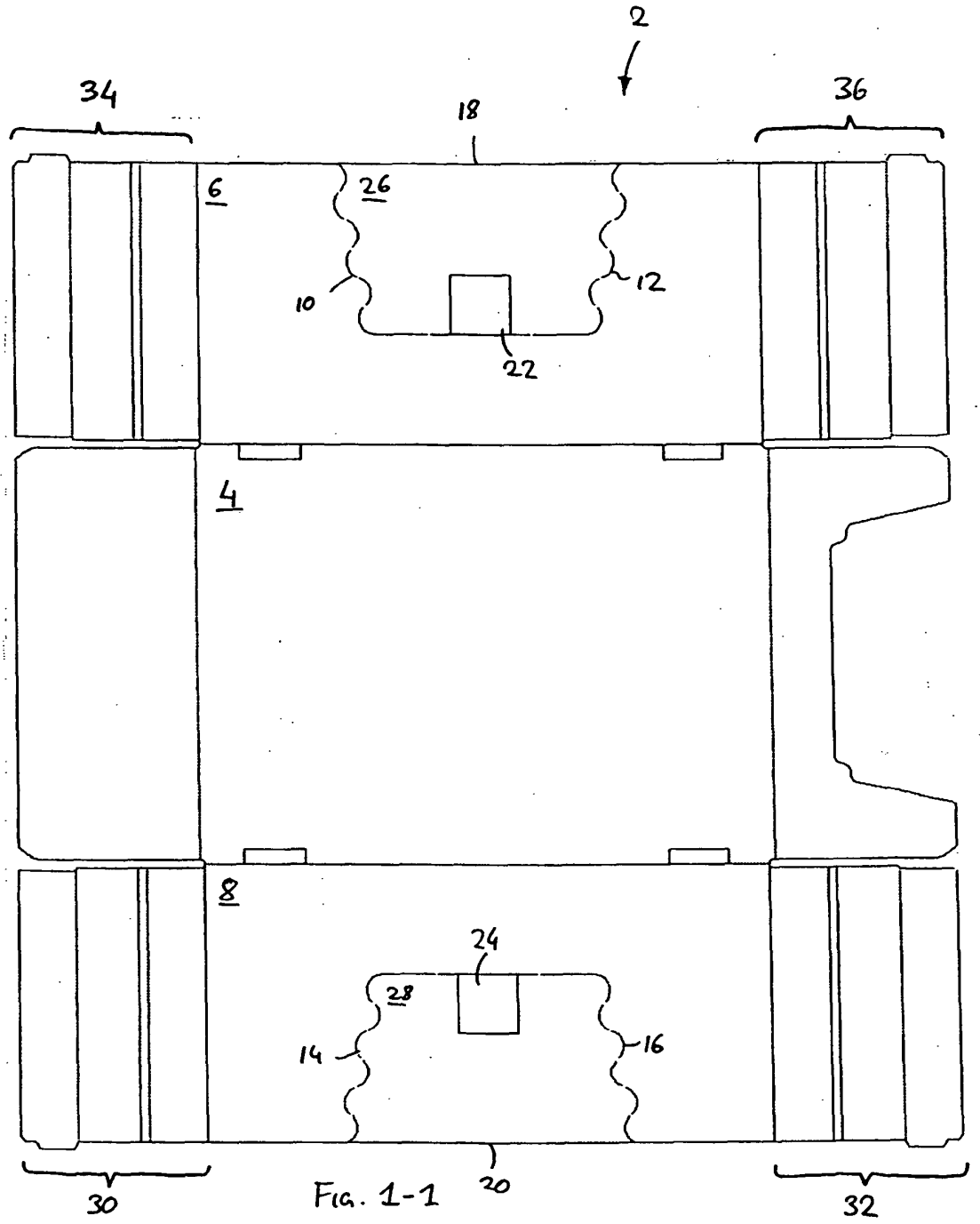


Fig. 1-1

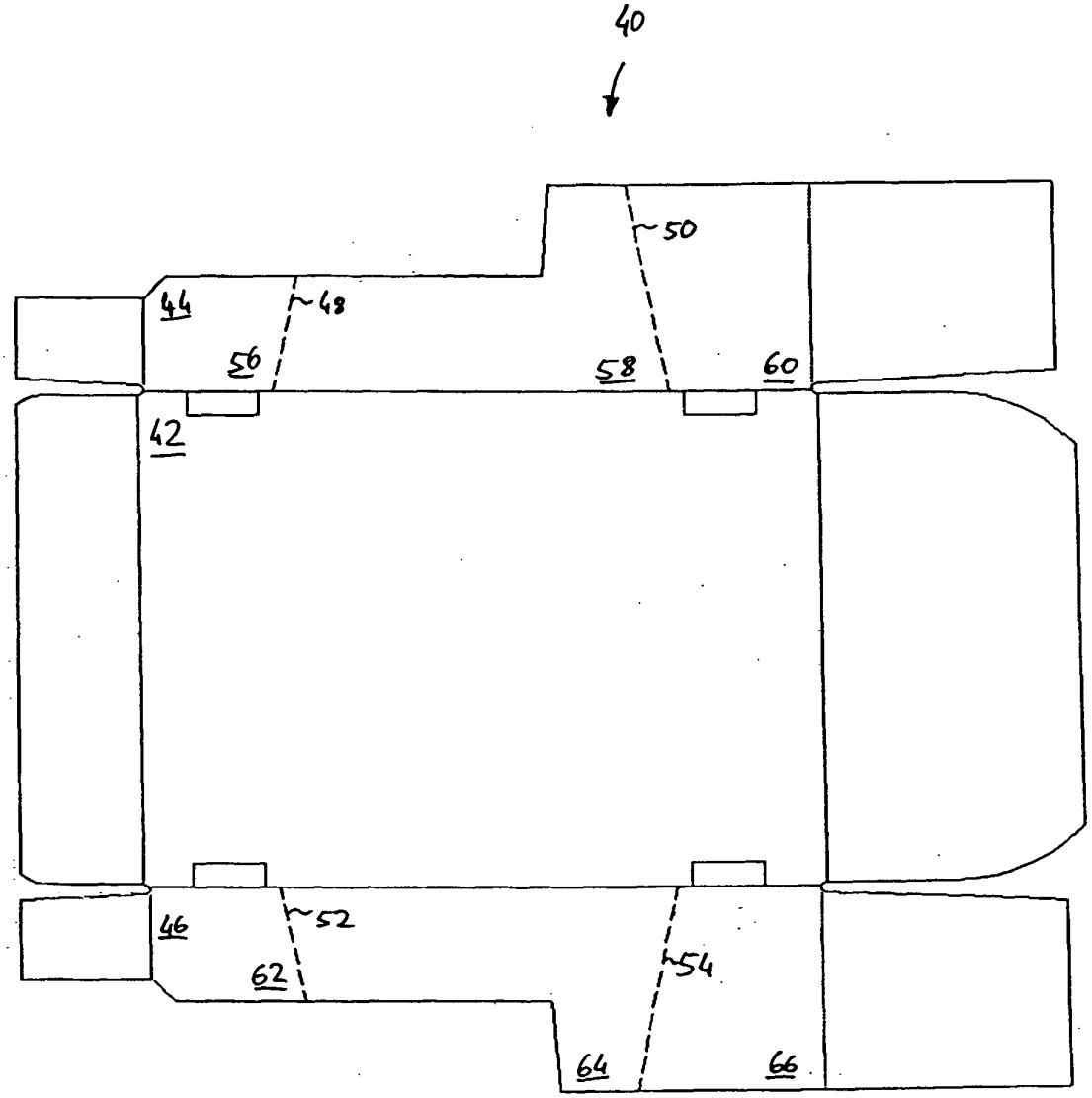


FIG. 1-3

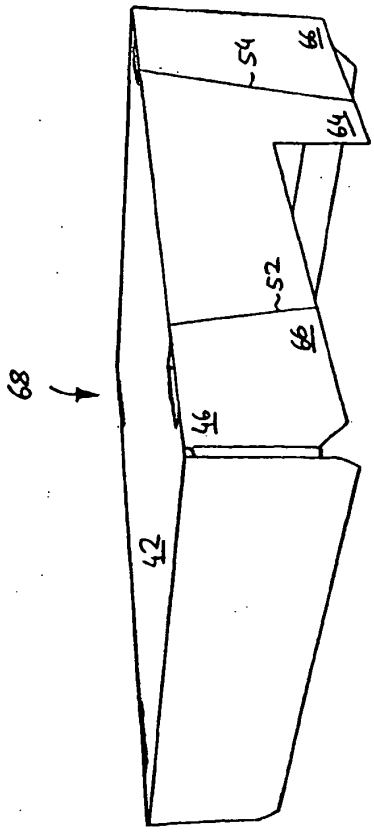


FIG. 1-4

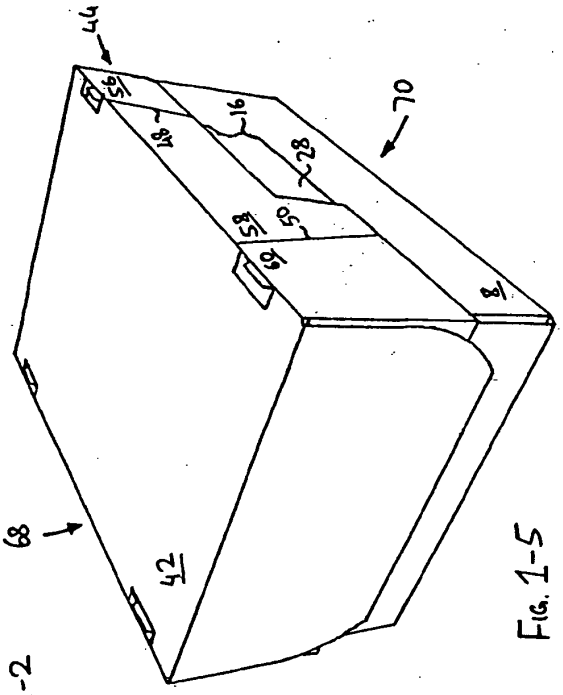


FIG. 1-5

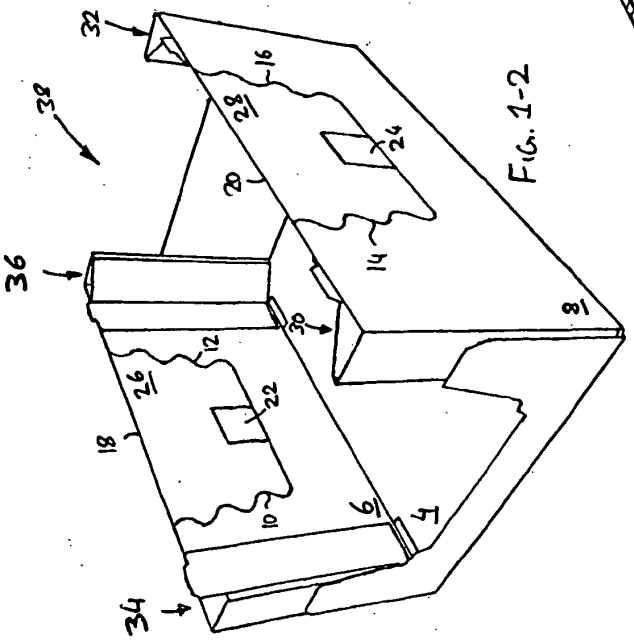


FIG. 1-2

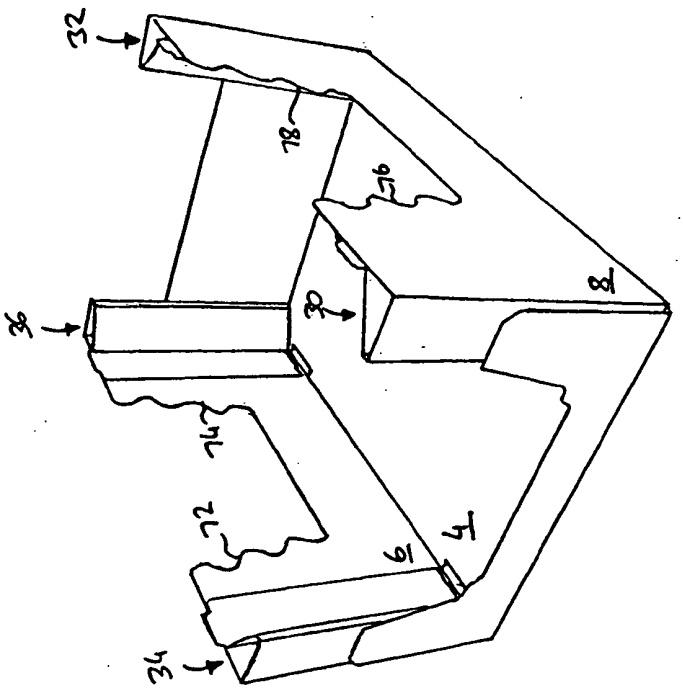


FIG. 1-7

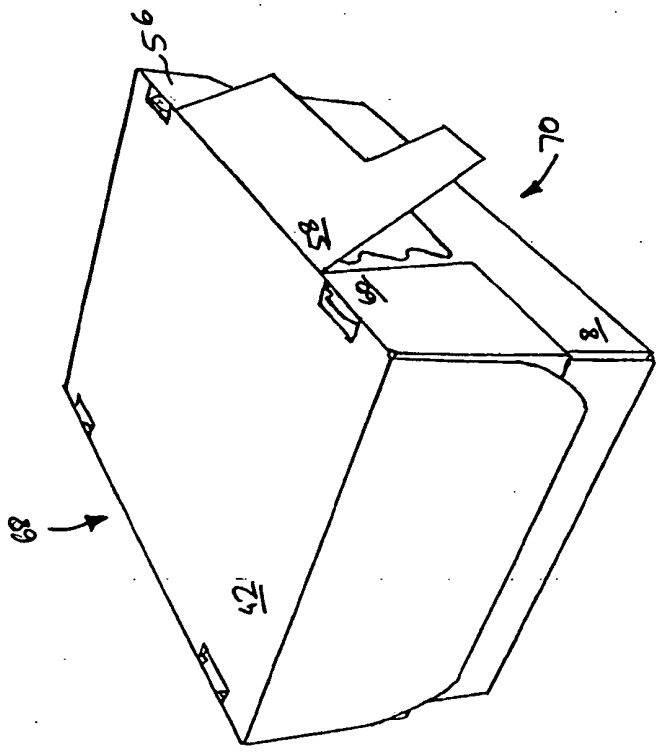


FIG. 1-6

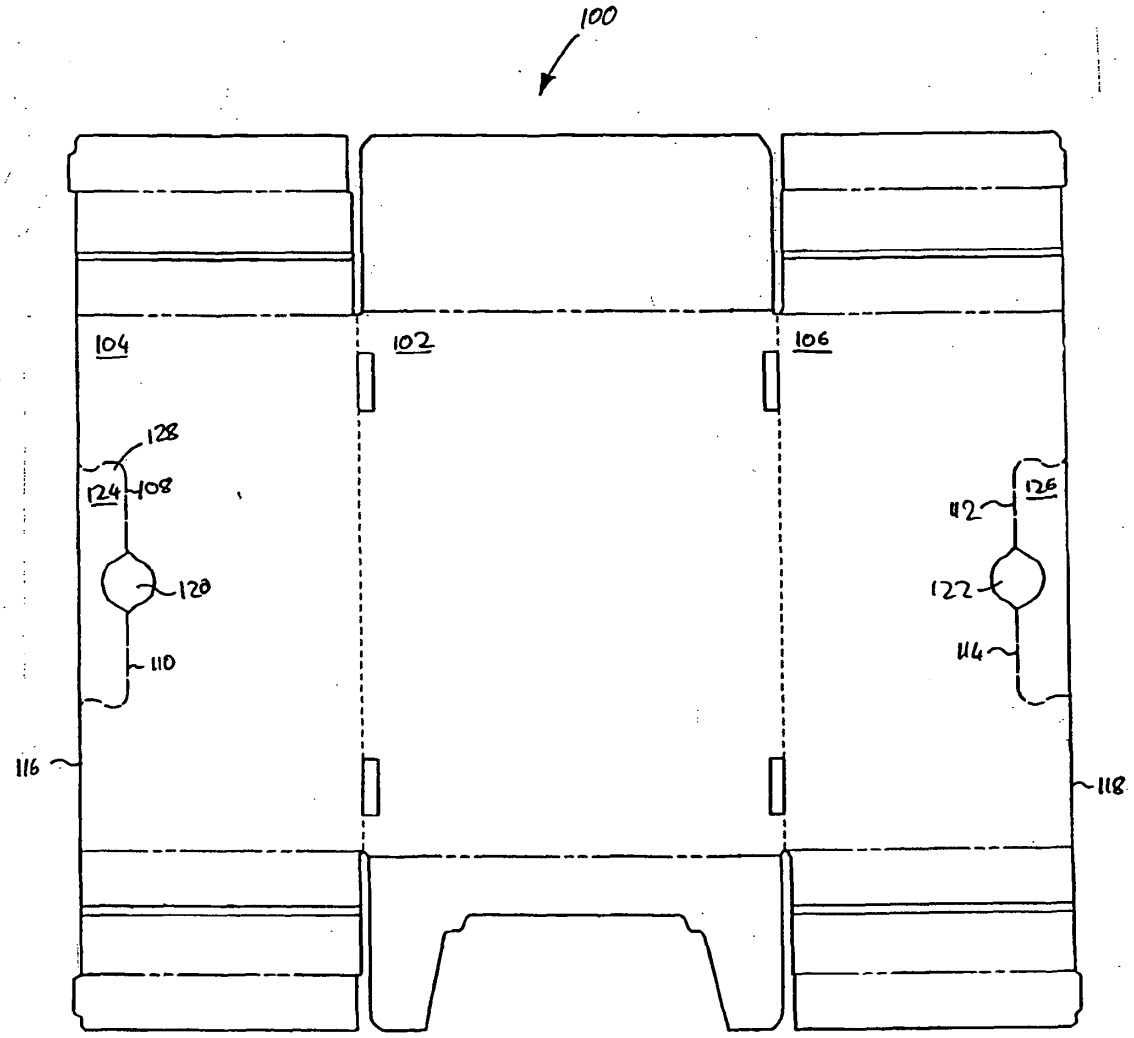


FIG. 2-1

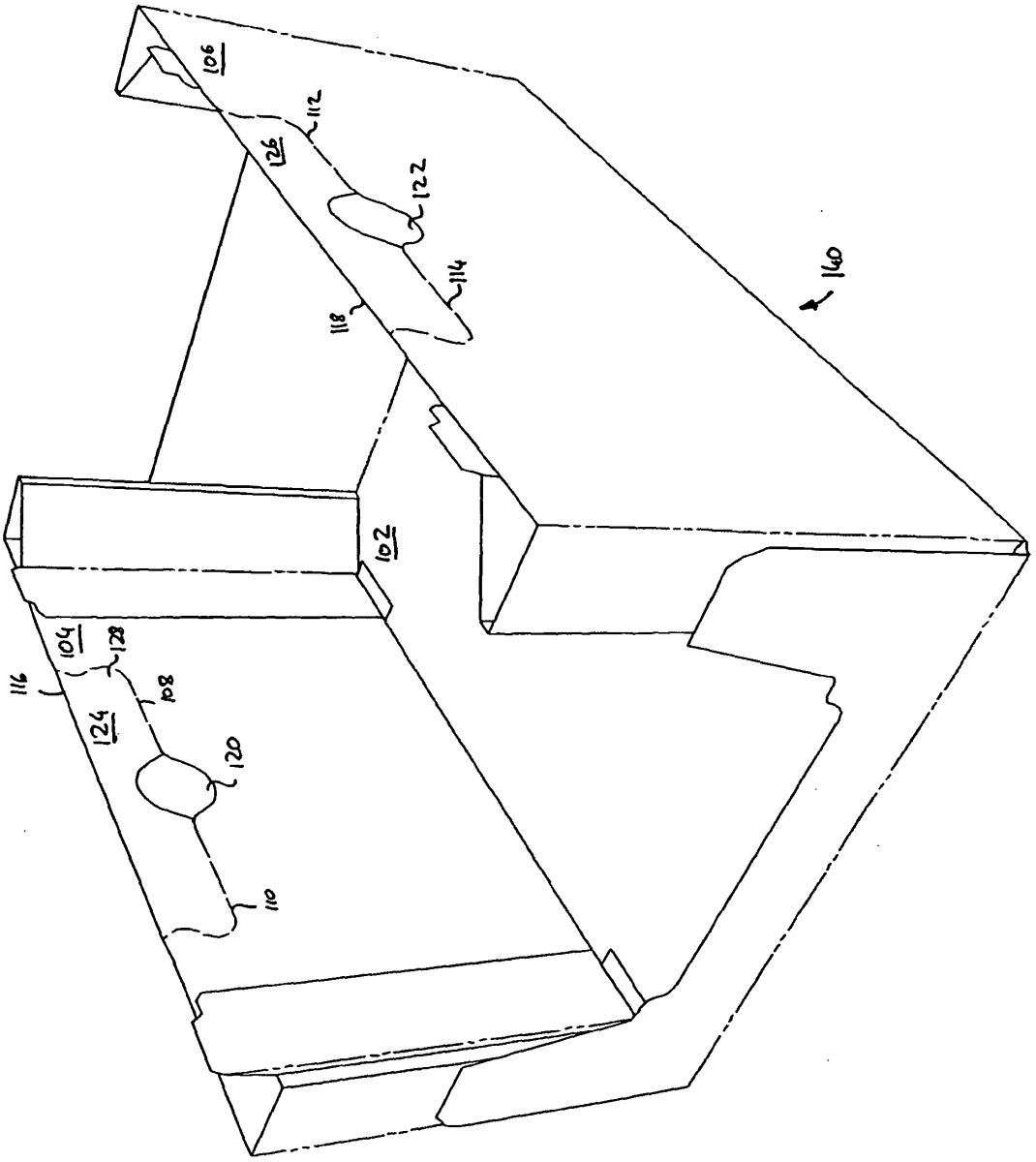


Fig 2-2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5657872 A **[0004]**
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