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Description

This invention generally relates to boxes of the kind which may be stored and transported in a substantially flat state, and then opened out to form a usable box when required. In particular, therefore, this invention relates to a box pre-form which may be opened out to form a box, and a box whenever formed from a pre-form of this invention.

Boxes for storing and transporting articles from one place to another are used in very large quantities throughout all kinds of commerce, including the agricultural and horticultural industries. Depending upon the particular requirements that a box must satisfy, such boxes are very often made from cardboard, fibreboard, or similar materials which may be reinforced as necessary, for example with strips of wood or of plastics materials (as described, for instance, in US-A-2868405). In the manufacture of such boxes, a suitably configured blank may be cut from a large sheet of the selected material, the blank then being scored or otherwise provided with hinge lines and the appropriate edges of the blank being joined together to produce a pre-form for the finished box. That preform may then be collapsed to lie substantially flat, and subsequently unfolded and opened out so as to form a usable box. To complete the unfolding and opening out of a box pre- form, certain finishing operations may be necessary, such as securing together at least some of the flaps of the box, for example by stapling, or by the use of adhesives or adhesive tapes.

Boxes of the kind described above are used extensively, in view of the advantage that the preforms may be stored and transported in the folded, substantially flat state, and opened out only when a box is to be used. However, the extra operations necessary to secure together at least some of the preform flaps when the box is to be used are time consuming and an inconvenience for the user; as a result such operations often are only partially or improperly completed by the end user of the box.

In an attempt to minimise the disadvantage mentioned above, there have been many proposals for boxes the flaps of which may be secured together by means of interlocking portions of those flaps. There have also been other proposals for facilitating erection of a box from a flat state.

For example, there are known boxes with a fold-flat capability which have a system of diagonal folds in the box bottom, and a longitudinal crease in the ends and adjoining bottom walls. These boxes have achieved widespread use, especially in the form of composite crates made from a blank of foldable board together with wooden slats. The opening out of such boxes may be quicker to perform and require less skill than is the case where stapling, glueing or other operations have to be performed. Nevertheless, it has been found that the known designs of boxes using interlocking flaps tend to display less stability than a box having its flaps more positively secured together for example by stapling or glueing. Often therefore such boxes may be suitable only for lighter duties, in order to minimise the likelihood of the interlocking flaps disengaging from each other.

Another proposal for a box with a fold-flat capability has been described in US-A-3921896. This box has projecting tabs from two flaps which define an end face of the box, which tabs may extend through openings in further tabs which upstand from the side faces. Though the box may be sealed with adhesive tape, by folding the sets of tabs to lie against adjacent faces of the box, the sets of tabs otherwise project from the side faces of the box, and so inhibit stacking and handling of such boxes when opened out. Moreover, the production of such boxes is particularly wasteful of the box-making material, in view of the fact the tabs have to project to an extent greater than any other dimension of the box.

It is one of the principal objects of this invention to provide a pre-form for opening out into a box, which opening out operation is easy to perform in that it does not require the use of staples, adhesives or other agents, but which box when opened out from the pre-form displays good stability and has a considerable strength.

According to this invention, there is provided a box pre-form for opening out into a box, which preform comprises means adapted to define four faces of the box (when opened out) with the adjacent corner edges hinged together to permit the pre-form to be folded to lie substantially flat or opened out into a box shape, the pre-form further comprising two first flaps hinged respectively one to each of two opposed face-defining means along an edge thereof, and two second flaps hinged respectively one to each of the other two face-defining means along corresponding edges thereof whereby the first and second flaps nay be folded to define a fifth face of the box when the pre-form is opened out, at least one first flap having a pair of opposed tabs projecting laterally adjacent the edge of that flap opposed to the hinged connection thereof to the adjacent face-defining means, which tabs are defined by stiffening means extending across said one first flap generally parallel to and spaced from said hinged connection, characterised in that said one first flap has a region of reduced width less than the internal width of the box and the tabs project therefrom to an extent substantially equal to the internal width of the box, and in that the two second flaps have openings appropriately

disposed to receive the tabs of the first flaps whereby opening-out of the box pre-form may be completed by hinging the first and second flaps to overlie one another so as to define the said fifth face of the box, the tabs of the first flaps being passed through the openings of the second flaps during said hinging of the flaps thereby to hold the box in its opened-out condition.

If the first flaps are configured so that they partially overlie each other when the box is fully opened out, only one first flap need be provided with tabs, this flap being folded last to be outside the other first flap when its tabs are interlocked with the second flaps. If however the first flaps do not overlap, then each first flap should be provided with tabs, each second flap being provided with a pair of openings to receive the tabs on the same side of the two first flaps.

In certain preferred embodiments of box pre-form of this invention, the stiffening means defining the tabs comprises strips of substantially rigid material, such as wooden slats, or of plastics material, stapled or otherwise secured to the flaps. Alternatively, the whole of the flap defining the tabs may be made of a stronger material, to ensure the tabs have adequate strength for the intended usage of the box.

It is further greatly preferred for the distance between the free ends of the tabs to be not greater than the internal width of the box (when opened), but arrangements would be possible where that distance is slightly greater than the internal width (whilst still being substantially equal to that width), the face-defining means then being appropriately apertured to receive the projecting ends of the tabs.

It will be appreciated that certain embodiments of box pre-form according to this invention may be particularly economical to manufacture, especially when using automated machinery. Moreover, the box may take the form of a composite crate manufactured from both foldable board and slats of wood or similar materials, and the usage of such materials may be optimised, so giving rise to further economic advantages.

Stability is preferably imparted to an opened out box of this invention in one of two ways. In one such way, the ends of the tabs are arranged to engage the corner regions at the hinge between the respective side face defining means and the second flaps, thereby preventing lozenging of the box. Alternatively, the respective corner regions between the tabs and the reduced width regions of the first flaps may engage the material of the second flaps immediately adjacent the respective openings therein, again to prevent such lozenging. In either case, the box is prevented from collapsing unless significant deformation of the material of the box itself takes place. Of course, both methods may be used together, in the same box.

In addition, though the tabs may be inserted through the openings with relative ease, for example by deflecting inwardly of the box the already-folded second flaps to an extent sufficient to permit the tabs to be passed through the openings, the tabs may not easily slip out of the openings by pressure applied internally of the box on the fifth face defined by the first and second flaps. As mentioned above, the resistance to inadvertent bursting open of the box may significantly be enhanced by reinforcing at least the tabs of the first flaps of the box; conveniently this may be done in the case of a box constructed from foldable board such as fibreboard or cardboard by doubling the material thickness at least in the region of the tabs, for instance by folding over that material and then securing together the overlying doubled material. Alternatively, for certain designs of box, the tabs may be separately formed from a rigid material which is affixed to the first flaps during the manufacture of the pre-form; in a preferred embodiment each pair of tabs is defined by a strip of rigid material such as a wooden slat which is stapled or otherwise affixed to the free edge of the first flap; the width of that first flap in the region of its free edge may then be reduced by an appropriate amount.

In a box of this invention, the means defining the four faces of the box conveniently define the four side faces of the box, and the first and second flaps together define the bottom of the box, when opened out. Nevertheless, the means defining the four faces could instead define two sides of the box, the top and the bottom, a third side face being defined by the pairs of first and second flaps. For such an arrangement, means should be provided to define the fourth side face of the box, and clearly such means may be constituted by further pairs of first and second flaps, configured similarly to the already-described pairs of first and second flaps.

For the case of a box whereof the pairs of first and second flaps are to define the bottom of the box, similar pairs of first and second flaps may be provided to define the top of the box. Alternatively, differently configured flaps may be hinged to the means defining the four side faces, such as the flaps of a conventional cardboard box each of which flaps is simply rectangular in shape, to permit closure of the box for instance by means of adhesive tapes. A further possibility is to provide further pairs of first and second flaps each configured in a similar manner to that described above for the bottom of the box, but with the pairs of first and second flaps having a relatively small extent in the plane of the sixth (top) face of the box, so as not significantly to obstruct that sixth face, when

folded to interengage in the described manner. Such a box may serve as an open topped box, whilst still displaying excellent stability, enhanced by the provision of an inwardly-directed rim around the top of the box.

The means defining the four faces of the box most simply comprise pieces of a semi-rigid foldable sheet material, such as cardboard or fibreboard. In its simplest form therefore a pre-form for a box of this invention may comprise a single blank cut from a piece of appropriate board material, the blank having hinge lines defined thereon for example by score lines or by pressure lines, and the end edges of the blank joined together whereby the four faces together form a continuous ring with the flaps depending from those faces. For the case of a vegetable or other produce box, greater strength may be required, as well as cutout regions to permit the free flow of air through the box; for this purpose at least two opposed sides may be formed by slats of wood or other rigid material, appropriately affixed to the material, for instance by stapling.

This invention further extends to a box whenever opened out from a pre-form of this invention.

By way of example only, certain specific embodiments of box pre-forms arranged in accordance with this invention and adapted for opening out into boxes will now be described in detail, reference being made to the accompanying drawings, in which:-

Figure 1 is a perspective view of the first embodiment of box pre-form, only two sides of that pre-form being shown in the drawing and the other two corresponding sides being omitted for clarity;

Figure 2 is an under plan view of one end portion of box pre-form according to Figure 1, but when opened out to form a complete box;

Figure 3 is a perspective view of a second embodiment of box pre-form, again only two sides thereof being shown and the other two corresponding sides being omitted for clarity;

Figure 4 is an underplan view of a further embodiment of box of this invention.

Figure 5 is a plan view of a blank used to produce a third embodiment of box pre-form of this invention; and

Figure 6 is a perspective view on an enlarged scale of an end portion of a box, during the opening-out procedure of the pre-form of Figure 5.

Referring initially to Figures 1 and 2, the first embodiment of box pre-form illustrated there in part comprises an end 10 and a side 11 hinged together about line 12; a further end corresponding but opposed to end 10 and a further side corresponding but opposed to side 11 are also provided but are not shown in Figure 1, for the sake of clarity. End 10 is cut from a piece of cardboard skinned with a plastics material to render that board substantially waterproof, and comprises a main area 13 which is reinforced by a wooden slat 14 stapled to extend along the top edge of that main area. Hinged to each side of the main area 13 are wings 15, the hinge lines 12 and 16 connecting the wings to the main area being defined for example by scores part-way through the thickness of the material, or by lines of reduced board thickness produced by a pressing operation. Hinged to the lower edge 17 of the main area 13 is a first flap 18, the hinge line being defined in a similar manner to that just described with reference to the wings 15. The first flap 18 has a tapering width from edge 17 towards the free edge of that flap, and a wooden slat 19 is stapled along that free edge, the slat 19 having an overall length equal to the length of slat 14 and so being almost equal to the internal width of the box, measured between the wings 15. The end portions 19a of the slat thus project beyond the board portion of the flap, as shown in Figure 1.

Side 11 and the corresponding opposed side (not shown in Figure 1) are constructed using the wings 15 of the opposed ends of the box and from two wooden slats 20 and a board strip 21 all arranged to extend parallel to one another and stapled to the wings. A further board strip 22 extends at right angles to the slats 20, midway therealong, secured for example by stapling.

Hinged to the lower edge 23 of side 11 is a second flap 24, that second flap being defined by a portion 25 of the strip 21 lying below the lower edge of side 11, as well as by extensions 26 of the wings 15 and an extension 27 of the strip 22, there being a further slat 28 arranged to extend parallel to the slats 20, but between the ends of the extensions 26 and 27. Strip 21 therefore has a first portion 29 which lies in the plane of side 11, and second portion 25 separated from the first portion 29 by means of a hinge line which second portion forms a part of the second flap hinged to side 11.

The ends of the slats may need to be profiled, or their lengths reduced slightly, to permit proper folding of the box about its hinge lines - for example at the ends of slats 14 and 20.

The box pre-form as described above may be packed to lie flat, by arranging for the illustrated end 10 and side 11 to lie substantially co-planar, with the first and second flaps 18 and 24 also lying in the same plane, and the end and side of the pre-form not illustrated in Figure 1 also lying in a co-planar fashion, but on top of the illustrated co-planar end and side 10 and end 11. Then, when the box is to be opened out ready for use, the sides and ends are relatively hinged until a right angle is defined at each corner between the re-

spective sides and ends. Next, the second flaps 24 are hinged inwardly of the box, so as to lie at least at a right angle to the adjacent side, whereafter first flaps 18 are also hinged inwardly, so as partially to overlie the already-hinged second flaps 24. Next, the end portions 19a of the two slats 19 have to be engaged behind the second portions 25 of the strips 21, which second portions form parts of the second flaps 24. This is best achieved by deflecting further the second flaps 24 until the end portions 19a may be snapped behind those minor areas 29, so lying on the inside of the box. When so positioned, the actual end faces of the end portions 19a engage the major portions 29 of the strips 21, in the immediate region of the lower edge 23 of side 11, and so impart considerable stability to the box. Moreover, when the first and second flaps 18 and 24 are pressed back, so as to lie substantially coplanarly, the end portions 19a cannot easily return to lie on the outside of the box and so the box assembled in this way displays considerable strength.

Stability of the box may further be enhanced by ensuring that the angle between the slat end portions 19a and the adjacent edge of the first flap 18 engage against the free edge of the second portion 25, of the strip 21, when the box is fully assembled. In such a case, the lengths of the end portions 19a may slightly be reduced, to clear the respective inside faces of the adjacent first portions 29 of strips 21.

Referring now to Figure 3, there is illustrated another embodiment of pre-form suitable for opening out into a box, and again only two sides of the box are shown, for clarity. The other two sides correspond in pairs to the two sides illustrated.

In this second embodiment of pre-form, side 30 is cut from a sheet of cardboard material skinned with a plastic film, and has a main area 31, two wings 32, a top strip 33 and a lower flap 34, all of which latter are hinged to the main area 31 in the same manner as has been described above with reference to Figures 1 and 2. The top flap 33 has a tab 35 hinged to each end thereof, whereas each wing 32 has an extension 36 hinged thereto, which extensions 36 form parts of a first flap 37 associated with end 38 of the box.

Each end 38 of the box comprises four slats 39 stapled to the wings 32 of the two similar opposed sides 30. The top slat 39 is not however stapled adjacent its ends, so as to permit the insertion of the tabs 35 between the adjacent end of the top slat 39 and the wing 32, when the box is being opened out.

Each of the two first flaps 37 comprises a pair of wooden slats 41 stapled to the extensions 36 of the wings 32, projecting below hinge lines 42. An outer edge part of each extension 36 is cut away, as illustrated at 43, whereby the lowermost slat 41 projects beyond extension 36, thereby to define two tabs 44. The overall length of the lowermost slat 41 is however slightly less than the internal width of the box, when opened, and so is equal to the length of the slats 39.

As illustrated in Figure 3, the lower flap 34 of each side 30 is provided with two cuts 45, appropriately positioned to receive the tabs 44 as the box is being opened out from the folded-flat preform. Such cuts could be simple linear cuts, or may, if required, be substantially L-shaped or flat-bottomed channel shaped, so as to assist the insertion of the tabs 44 therethrough. Two possibilities are shown in Figure 3.

As with the first embodiment of box pre-form described above, the box may be folded to lie substantially flat, with one adjacent side and end lying substantially co-planar and the other side and end also lying substantially co-planar but over the first- mentioned pair. The various flaps of the box may also be hinged to lie co-planar with the sides and ends to which the flaps are respectively hinged. When the box is to be opened out, the sides and ends are relatively hinged until a right angle is defined at each corner; then the lower flaps 34 hinged to the sides 31 are hinged inwardly so as to form part of the bottom of the box. After this, the two first flaps 37 are also hinged inwardly so as externally to overlie the lower flaps 34, and the tabs 44 defined by the lowermost slats 41 are pressed through the cuts 45 in the lower flaps 34, such that the tabs are disposed within the box, above the lower flaps 34. When so positioned, the actual ends of the tabs 44 are just clear of the main areas 31 of the two sides 30, in the region of the hinge line between the main areas and the lower flaps 34, but considerable stability is imparted to the box by having the edge 43 of each extension adjacent tabs 44 engage against the material of the lower flap 34 at the cut 45 where tab 44 projects through that flap. Finally, to complete the box, the top flaps 33 are folded inwardly to lie parallel to she box bottom, the tabs 35 during this being pressed inbetween the wings 32 and ends of the top slats 39 of the two sides 38. Completed in this way, the box preform is opened out to form an open topped box, which displays extremely good stability, with a good strength.

Figure 4 is an underplan view of another, but simpler, embodiment of box of this invention, when fully opened out. It can be seen that the bottom of the box comprises two first flaps 50 and two second flaps 51, each of which has a slat affixed by stapling to the free edge thereof remote from its hinge connection to the adjacent box side. Second flaps 51 have a width substantially equal to the internal width of the box, whereas first flaps 50 are

tapered towards their free edges; the slats 52 associated with the first flaps have a greater length than the first flap free edges such that the projecting end portions of those slats 52 define tabs 53. Slats 54 associated with the second flaps 51 are of substantially the same length as the free edges of those flaps.

When the box of Figure 4 is fully assembled, as shown in that Figure, the portions of the first flaps which overlap the second flaps lie outside those second flaps, but the projecting tabs 53 of the first flaps lie inside the second flaps. Stability is imparted by having the reinforced edges of the second flaps trapped in the angle between the reinforcement of the first flaps and the edges of those first flaps running back to the hinge edges.

Figure 5 shows a blank of yet another embodiment of this invention, prior to the folding of that blank to provide a pre-form for a box. The blank is cut from a sheet of plastics coated cardboard and is scored so as to define hinge lines separating the blank into various areas including a box bottom 60, side walls 61 and 62, respectively connected to the long edges of the bottom 60, and top edge strips 63 and 64, respectively connected to the side walls 61 and 62. Areas 65, connected to the short edges of the bottom 60, each define a first flap for forming an end wall of the box, and areas 66 define pairs of second flaps, respectively connected to the ends of side walls 61 and 62. The width of each first flap 65 is reduced remote from the bottom 60, as shown. Each second flap 66 has a generally U-shaped cut 67 formed therein, and each side wall 61 and 62 has a hand-opening 69 formed centrally therein.

The blank has wooden reinforcing strips 70 stapled thereto, along the free end edges of the second flaps 66, and across the side walls 61 and 62, as shown. Further wooden strips 71 are stapled to the long free edges of the first flaps 65, so that those strips project beyond the adjacent short edges of the first flaps 65; in this way, tabs 72 are defined by the strips 71.

The box pre-form is completed by stapling a pair of end flaps 73 between the top strips 63 and 64, at the ends thereof. In Figure 5, those end flaps are shown stapled only to top strip 64; on folding of the blank about the longitudinal hinge lines, the opposite corner regions of the end flaps 73 may be stapled to the top strips 63, in a similar manner. In this way, flaps 65 and 73 at each end of the box serve to define a pair of co-operating first flaps.

The completed box pre-form described above may be transported in a flat condition, for example with side wall 62 and flaps 73 overlying bottom 60 and side wall 61, all the end flaps also in the same general plane. Then, when it is desired to open out the box, the side walls are erected with respect to the bottom 60 with flaps 73 lying parallel to the bottom 60. Second flaps 66 are folded inwardly and flaps 73 folded downwardly, and the box is completed by folding upwardly flaps 65 so as partially to overlie flaps 73. The flaps 65 are then pushed inwardly of the box until the tabs 72 thereof pass through cuts 67 in the second flaps 66, whereafter outward bursting pressure from within the box is resisted by engagement of those tabs 72 with the reinforced second flaps 66. Moreover, considerable stability is imparted to the box by virtue of the reinforcing strips 70 on the second flaps 66 engaging at their ends the bottom 60 and top strips of flaps 73, and the interengagement of the cut back portions of flaps 65 with the edges of the cuts 68 formed in the second flaps 66.

In view of the particular construction of the embodiments of pre-forms described above, utilising plastics-skinned water-resistant board and wooden slats, the boxes find particular application in horticulture, for use as vegetable boxes. It will however be appreciated that such boxes may be used for a very wide variety of purposes, and that by substituting the materials used for others, the preforms may be employed to make boxes suitable for a very wide variety of uses.

Claims

1. A box pre-form for opening out into a box, which pre-form comprises means adapted to define four faces of the box (when opened out) with the adjacent corner edges hinged together to permit the pre-form to be folded to lie substantially flat or opened out into a box shape, the pre-form further comprising two first flaps (18,65) hinged respectively one to each of two opposed face-defining means (10,60,63,64) along an edge thereof, and two second flaps (24,66,73) hinged respectively one to each of the other two face-defining means (11,61,62) along corresponding edges thereof whereby the first and second flaps (18,24,65,66,73) may be folded to define a fifth face of the box when the pre-form is opened out, at least one first flap (18,65) having a pair of opposed tabs (19a, 72) projecting laterally adjacent the edge of that flap opposed to the hinged connection thereof to the adjacent face-defining means, which tabs (19a, 72) are defined by stiffening means (19,71) extending across said one first flap (18,65) generally parallel to and spaced from said hinged connection, characterised in that said one first flap (18,65) has a region of reduced width less than the internal width of the box and the tabs (19a,72) project therefrom to an extent substantially equal to the internal width of the box

and in that the two second flaps (24,66) have openings (45,67) appropriately disposed to receive the tabs (19a,72) of the first flaps (24,66) whereby opening-out of the box pre-form may be completed by hinging the first and second flaps to overlie one another so as to define the said fifth face of the box, the tabs of the first flaps being passed through the openings of the second flaps during said hinging of the flaps thereby to hold the box in its opened-out condition.

2. A box pre-form according to claim 1 , further characterised in that each first flap (18) is provided with laterally-projecting tabs (19a), each second flap (11) being provided with a pair of openings (45;67) to receive the tabs on the same side of the two first flaps.

3. A box pre-form according to any of the preceding claims, characterised in that the ends of the tabs (19a) are arranged to engage the corner regions at the hinge between the respective side face defining means (11) and the second flaps (24) when the box is opened out, so as thereby to impart stability to the box.

4. A box pre-form according to any of claims 1 to 3, characterised in that the respective corner regions between the tabs (72) and the reduced width regions of the first flaps (65) engages the material of the second flaps (66) immediately adjacent the respective openings (67) therein when the box is opened out, so as to impart stability to the box.

5. A box pre-form according to any of the preceding claims, characterised in that the means defining the four faces of the box define the four side faces (10,11) of the box, and the first and second flaps (18,24) together define the bottom of the box, when opened out.

6. A box pre-form according to any of claims 1 to 4, characterised in that the means defining the four faces of the box define two sides (61,62) of the box, the top (63,64) and the bottom, each end face of the box being defined by pairs of said first and second flaps (65,66,73).

7. A box pre-form according to any of the preceding claims, characterised in that the means defining the four faces of the box and the associated flaps comprises pieces of a semi-rigid foldable sheet material, strips (71) of rigid material being secured to the first flaps (65)to reinforce said tabs thereof.

8. A box pre-form according to any of claims 1 to 7, characterised in that the face defining means which define at least two sides of the box comprises slats (20,39,53,54) of a rigid material, appropriately affixed to each other.

9. A box pre-form according to Claim 1, and further characterised in that said one first flap (65) provided with tabs (72) partially overlies the other first flap (73) when the box is opened out, the tabs (72) of said one first flap holding both first flaps (65,73) in their respective positions when the box is fully opened out.

Revendications

1. Préforme de boîte destinée à être rabattue pour former une boîte, la dite préforme comprenant des moyens adoptés an vue de définir (lorsque rabattus) quatre faces de la boîte, avec les arêtes adjacentes articulées ensemble de manière à permettre à la préforme soit d'être dépliée pour reposer on substance à plat, soit d'être rabattue en forme de boîte, la préforme comprenant en outre deux premiers volets (18, 65) articulés chacun à chacun à de deux moyens opposés définissant une face (10, 60, 63, 64) le long d'un de ses bords, et deux seconds volets (24, 66, 73) articulés chacun à chacun à deux autres moyens définissant une face (11, 61, 62) le long des bords correspondants de ceux-ci, tandis que les premiers et seconds volets (18, 24, 65, 66, 73) peuvent être pliés de manière à définir une cinquième face de la boîte lorsque la préforme est rabattue, au moins un premier volet (18, 65) possédant une paire de pattes opposées (19a, 72) s'étendant latéralement en position adjacente au bord du volet opposé à la liaison articulée reliant ce dernier moyen adjacent définissant une face, ces pattes (19a, 72) étant définies par des moyens de raidissement (19, 71) s'étendant à travers le dit premier volet (18, 65), et étant généralement parallèles à et écartés de la dite liaison articulée, **caractérisée en ce que** le dit premier volet (18, 65) possède une région de largeur réduite à une largeur inférieure à la largeur intérieure de la boîte et en ce que les pattes (19a, 72) s'étendent à partir de cet endroit sur une distance en substance égale à la largeur intérieure de la boîte, et **en ce que** les deux seconds volets (24, 66) possèdent des ouvertures (45, 67) disposées de manière appropriée afin de recevoir les pattes (19a, 72) des premiers volets (24, 66), le rabattement de la préforme de boîte pouvant être terminé en articulant le premier et le second volets de manière à les

superposer l'un sur l'autre et de définir la dite cinquième face de la boîte, les pattes des premiers volets étant passées à travers les ouvertures des seconds volets au cours de la dite articulation des volets pour ainsi maintenir la boîte dans son état rabattu.

2. Préforme de boîte selon la revendication 1, en outre **caractérisée en ce que** chaque premier volet (18) est doté de pattes s'étendant latéralement (19a), chaque second volet (11) étant doté d'une paire d'ouvertures (45, 67) destinées à recevoir les pattes du même côté des deux premiers volets.

3. Préforme de boîte selon l'une quelconque des revendications précédents, **caractérisée en ce que les** extrémités des pattes (19a) sont disposées pour accrocher, lorsque la boîte est rabattue, les régions des arêtes à l'articulation entre les moyens définissant la dite face latérale correspondante (11) et les seconds volets (24), de manière à renforcer ainsi la stabilité de la boîte.

4. Préforme de boîte selon l'une quelconque des revendications 1 à 3, **caractérisée en ce que** les régions respectives des coins entre les pattes (72) et les régions de largeur réduite des premiers volets (65) accrochent, lorsque la boîte est robattue, le matériau des seconds volets (66) immédiatement adjacents aux ouvertures respectives (67) de ces seconds volets, de manière à améliorer la stabilité de la boîte.

5. Préforme de boîte selon l'une quelconque des revendications précédentes. **caractérisée en ce que** les moyens définissant les quatre faces de la boîte définissent les quatre faces latérales (10, 11) de la boîte, et les premier et second volets (18, 24) définissent ensemble le fond de la boîte lorsque rabattus.

6. Préforme de boîte selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** les moyens définissant les quatre faces de la boîte définissent deux côtés (61, 62) de la boîte, le haut (63, 64) et le fond, chaque face extrême de la boîte étant définie par des paires des dits premier et second volets (65, 66, 73).

7. Préforme de boîte selon l'une quelconque des revendications précédents, **caractérisée en ce que** les moyens définissant les quatre faces de la boîte et les volets associés comprennent des pièces d'un matériau en feuilles semi-rigides pliables, des bandes (71) de matériau rigide sont fixées aux premiers volets (65) pour renforcer les dites pattes de ces volets.

8. Préforme de boîte selon l'une quelconque des revendications 1 à 7, **caractérisée en ce que** les moyens définissant les faces qui définissent au moins deux côtés de la boîte comprennent des lattes (20, 39, 53, 54) en matériau rigide, fixées de manière appropriée les unes aux autres.

9. Préforme de boîte selon la revendication 1, en outre **caractérisée en ce que** le dit premier volet (65) doté de pattes (72) recouvre partiellement l'autre premier volet (73) lorsque la boîte est rabattue, les pattes (72) du dit premier volet retenant les deux premiers volets (65, 73) en leur position respective lorsque la boîte est complètement rabattue.

Patentansprüche

1. Kastenform zum Aufstellen zu einem Kasten, wobei die Vorform Mittel zur Bildung von vier Seiten des Kastens (im aufgestellten Zustand) mit benachbarten Eckkanten gelenkig miteinander verbunden aufweist, um die Vorform in eine im wesentlichen ebene Lage zu falten oder in eine Kastenform zu öffnen, wobei die Vorform ferner zwei erste Klappen (18, 65), die jeweils an einer Kante einer von zwei einander gegenüberliegenden, seitenbildenden Mitteln (10, 60, 63, 64) angelenkt sind, und zwei zweite Klappen (24, 66, 73) aufweist, die an entsprechenden Kanten jeweils einer der beiden anderen seitenbildenden Mittel (11, 61, 62) angelenkt sind, so daß die ersten und zweiten Klappen (18, 24, 65, 66, 73) zur Bildung einer fünften Seite des Kastens gefaltet werden können, wenn die Vorform geöffnet ist, wobei mindestens eine erste Klappe (16, 65) ein Paar einander gegenüberliegender Lappen (19a, 72) aufweist, die sich seitlich benachbart der Kante der Klappe gegenüber deren Anlenkverbindung zu den benachbarten, seitenbildenden Mitteln erstrecken, wobei die Lappen (19a, 72) durch versteifte Mittel (19, 71) gebildet sind, die sich über eine erste Klappe (18, 65) im wesentilchen parallel zu und im Abstand von der Anlenkverbindung erstrecken, **dadurch gekennzeichnet,** daß die eine erste Klappe (18, 65) einen Bereich verringerter Breite weniger als die innere Breite des Kastens hat und die Lappen (19a, 72) sich von ihr in einem Maße im wesentlichen gleich der inneren Breite des Kastens erstrecken und daß die beiden

zweiten Klappen (24, 66) geeignet angeordnete Öffnungen (45, 67) zur Aufnahme der Lappen (19a, 72) der ersten Klappe (24, 66) haben, so daß das Aufstellen der Kastenvorform durch Klappen der ersten und zweiten Klappen in eine einander überdeckende Lage bewirkt werden kann, so daß eine fünfte Seite des Kastens gebildet wird, wobei während des Klappens der Klappen die Lappen der ersten Klappen durch die Öffnungen der zweiten Klappen geführt werden, um den Kasten in seinem aufgestellten Zustand zu halten.

2. Kastenvorform nach Anspruch 1, ferner **dadurch gekennzeichnet,** daß jede erste Klappe (18) mit seitlich vorstehenden Lappen (19a) und jede zweite Klappe (11) mit einem Paar Öffnungen (45; 67) zur Aufnahme der Lappen an der gleichen Seite der beiden ersten Klappen versehen ist.

3. Kastenvorform nach einem vorhergehenden Ansprüche**, dadurch gekennzeichnet,** daß die Enden der Lappen (19a) so angeordnet sind, daß sie in Eingriff mit Eckbereichen an den Verbindungen zwischen den jeweiligen seitenbildenden Mitteln (11) und den zweiten Klappen (24) kommen, wenn der Kasten aufgestellt ist, um dadurch dem Kasten Stabilität zu geben.

4. Kastenvorform nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet,** daß die jeweiligen Eckbereiche zwischen den Lappen (72) und den Bereichen verringerter Breite der ersten Klappen (65) unmittelbar benachbart zu den jeweiligen Öffnungen (67) in den zweiten Klappen (66) in Eingriff mit deren Material kommen, wenn der Kasten aufgestellt wird, um so dem Kasten Stabilität zu geben.

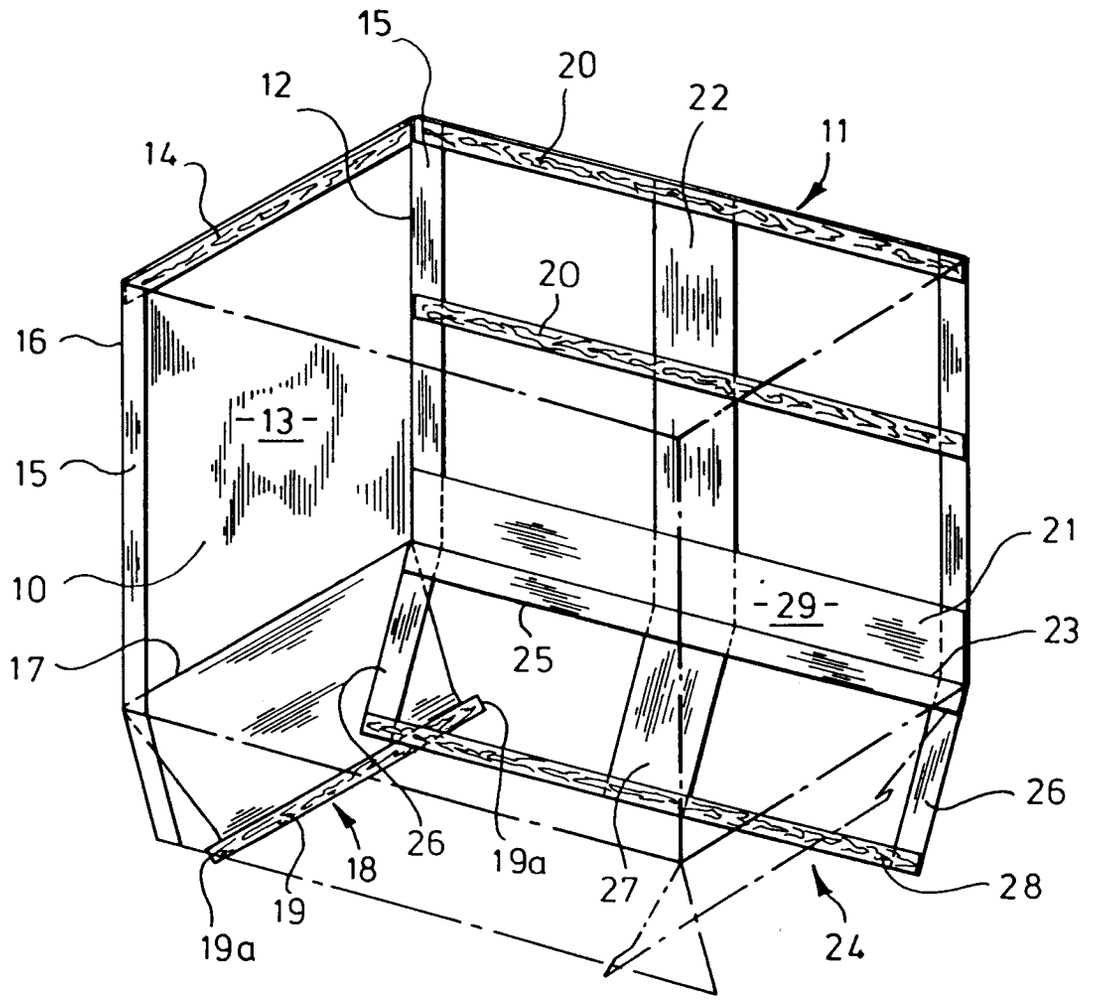
5. Kastenvorform nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet,** daß die vier seitenbildenden Mittel des Kastens die vier Seitenwände (10, 11) des Kastens und die ersten und zweiten Klappen (18, 24) zusammen den Boden des Kastens bilden, wenn dieser aufgestellt ist.

6. Kastenvorform nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet,** daß die vier seitenbildenden Mittel des Kastens zwei Seitenwände (61, 62) des Kastens, die Deckwand (63, 64) und den Boden bilden, während jede Endfläche des Kastens durch ein Paar der ersten und zweiten Klappen (65, 66, 73) gebildet wird.

7. Kastenvorform nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet,** daß die vier Seiten des Kastens bildenden Mittel und die zugehörigen Klappen Stücke aus halbstarkem, faltbaren Bogenmaterial aufweisen und Streifen (71) aus starrem Material an den ersten Klappen (65) befestigt sind, um deren Lappen zu verstärken.

8. Kastenvorform nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet,** daß die seitenbildenden Mittel, die zumindest zwei Seitenwände des Kastens bilden, Streifen (20, 39, 53, 54) aus starrem Material aufweisen, die geeignet aneinander befestigt sind.

9. Kastenvorform nach Anspruch 1, ferner **dadurch gekennzeichnet,** daß die Lappen (72) aufweisende erste Klappe (65) die andere erste Klappe (73) teilweise überdeckt, wenn der Karton aufgestellt ist, und die Lappen (72) dieser ersten Klappe beide ersten Klappen (65, 73) in ihrer jeweiligen Stellung halten, wenn der Kasten vollständig aufgestellt ist.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19a
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19a
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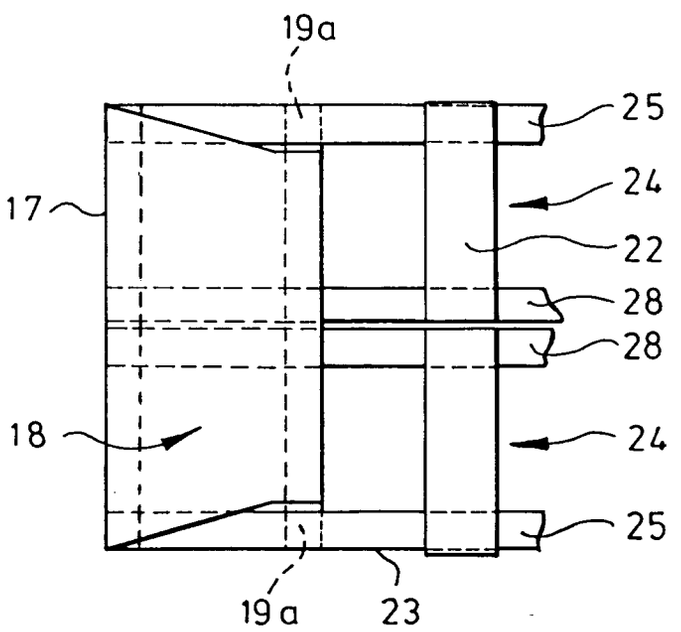
Fig. 1


19a
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19a
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Fig. 2

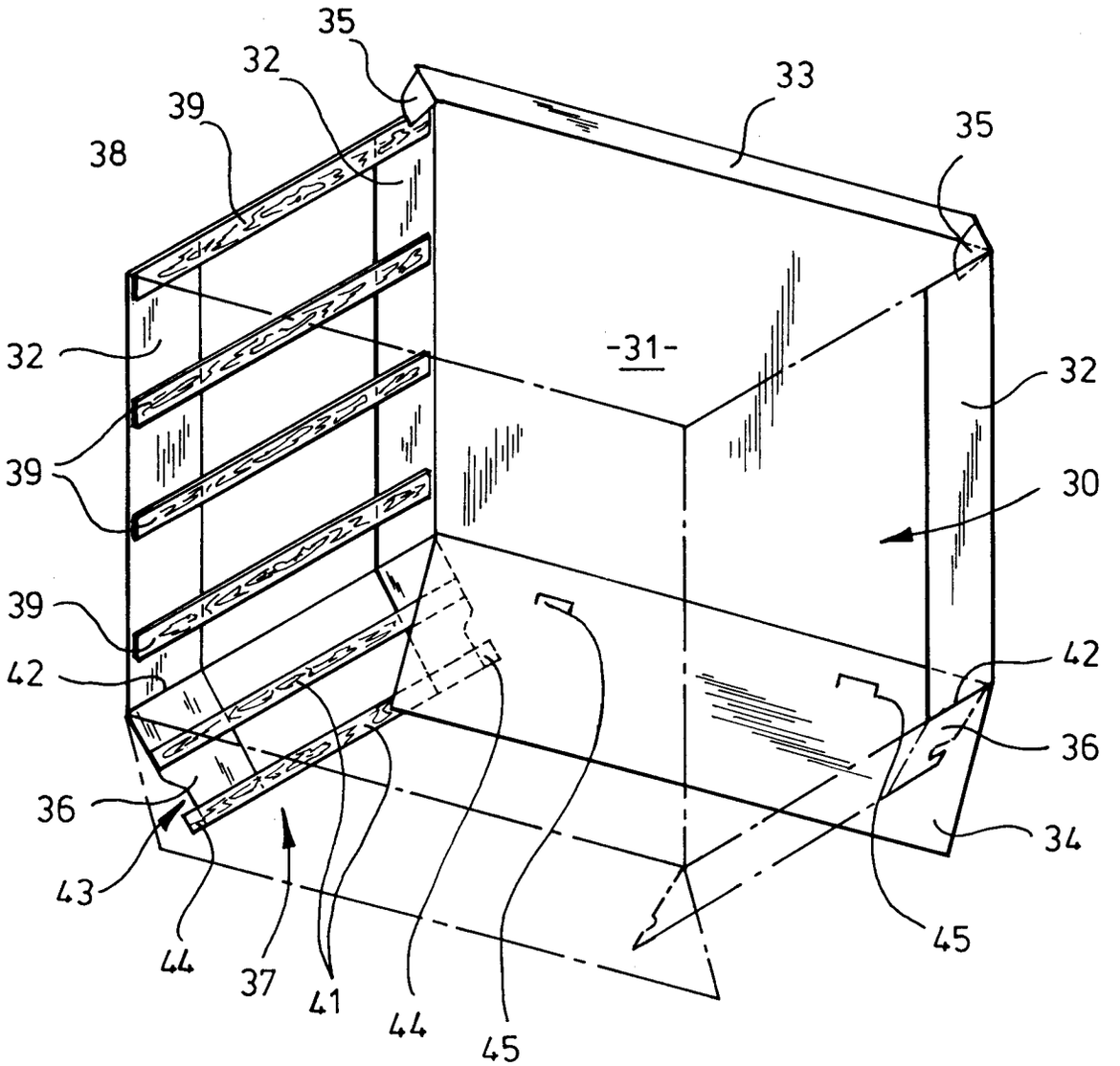

Fig. 3

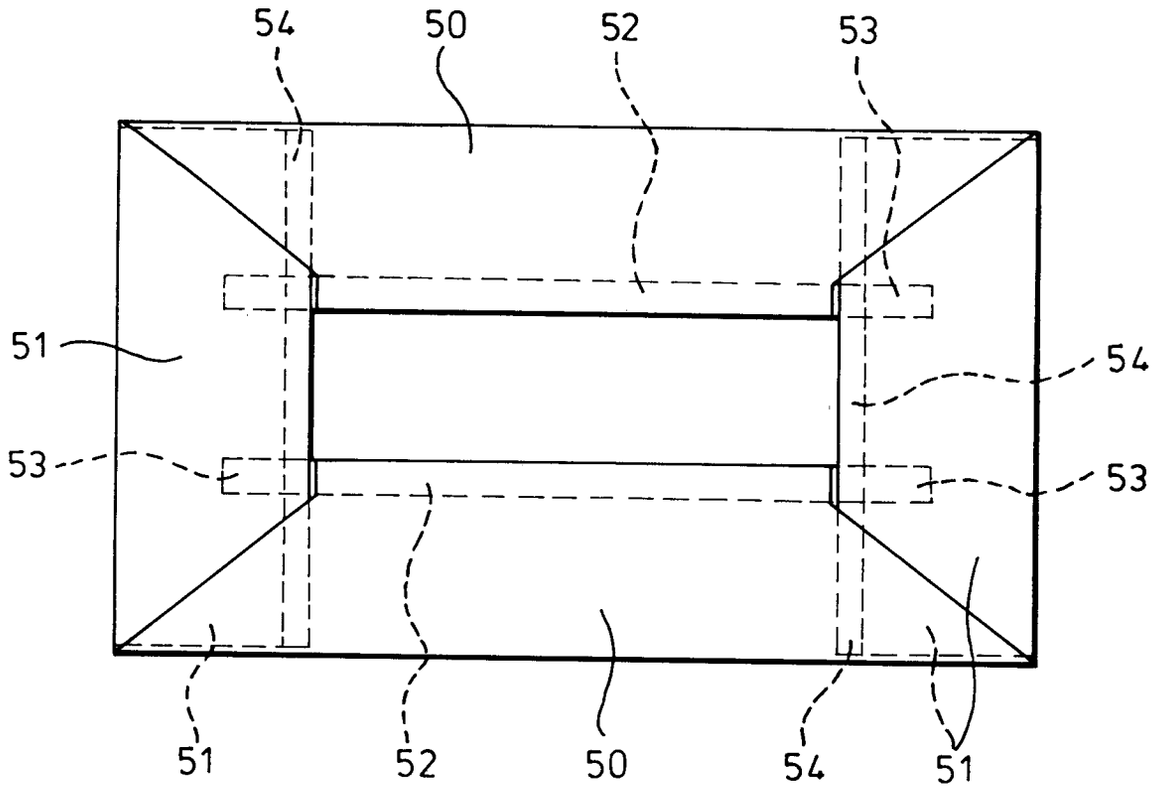

Fig. 4

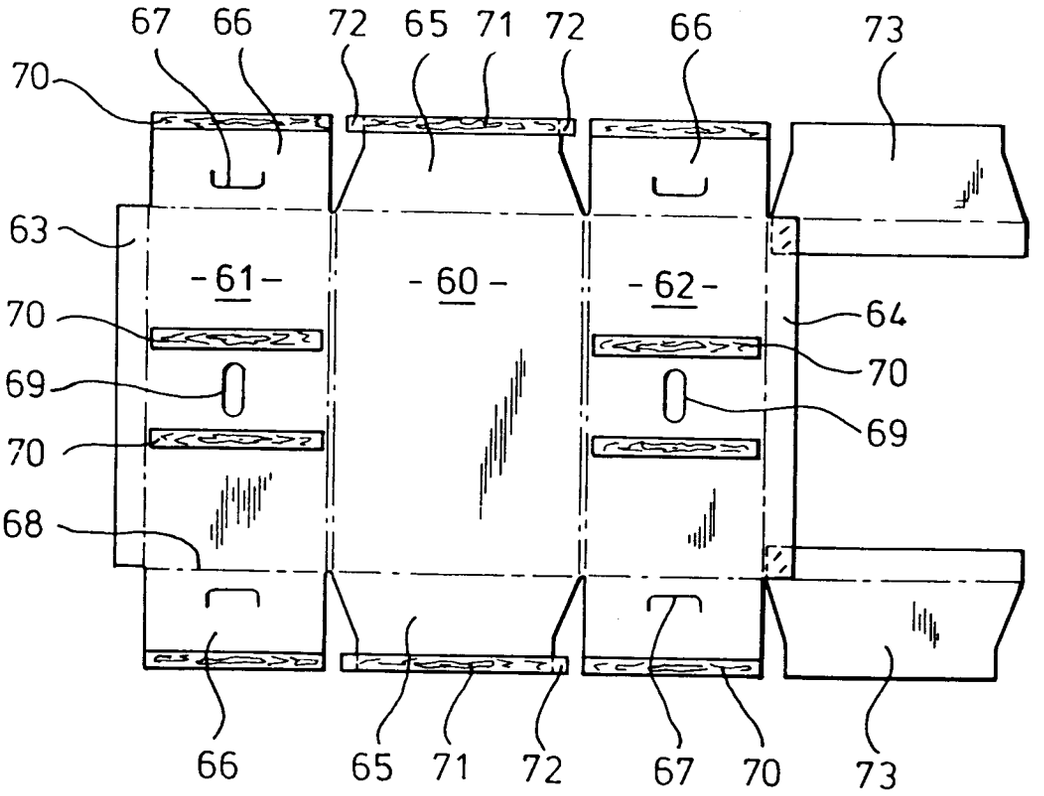
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Fig. 5

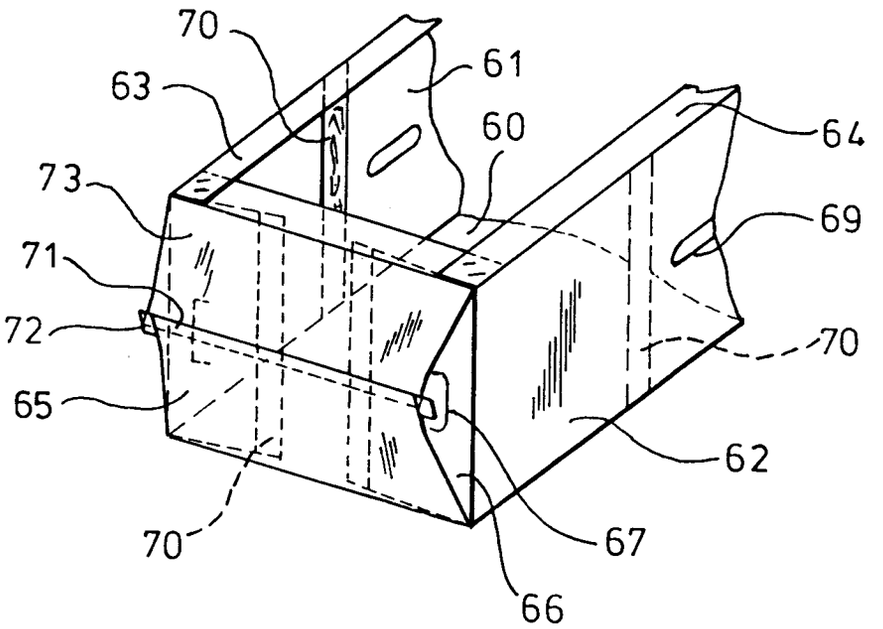
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Fig. 6