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(54) **Collapsible box with corner reinforcement and blank therefor**

(57) The invention relates to a collapsible box, and to a blank therefor, which box comprises a bottom panel (3) and, pivotally connected therewith, sidewall panels (4,6) located in pairs opposite each other. These sidewall panels, via fastening flaps (8), are mutually pivotally connected such, and further provided with fold lines such, that the box is foldable between a set-up position, in which the sidewall panels extend substantially at right angles to the bottom panel, and a collapsed position, in which the sidewall panels are folded on the bottom panel.

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The box is reinforced along two opposite sidewall panels with an inner side panel (10) and is reinforced in each corner with a substantially triangular tubular profile located substantially at right angles to the bottom panel. As a result, a constructionally stiff box is obtained, which can be manufactured from a relatively thin, at least light, cardboard type, while maintaining, or actually increasing, stiffness and stacking strength. As a result, material can be saved.

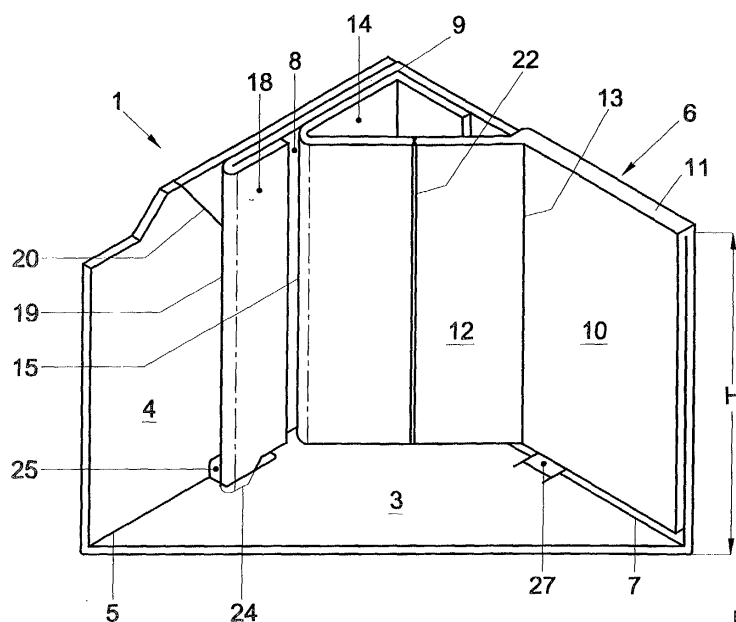


Fig. 1

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Description

[0001] This invention relates to a collapsible box, comprising a bottom panel and sidewall panels located in pairs opposite each other and pivotally connected with this bottom panel, which sidewall panels, via fastening flaps, are mutually pivotally connected such, and further are provided with fold lines such, that the box is foldable between a set-up position, in which the sidewall panels extend substantially at right angles to the bottom panel, and a collapsed position, in which the sidewall panels are folded onto the bottom panel.

[0002] Such collapsible boxes, also referred to as ready-for-use cartons, are known from practice. The boxes offer the advantage that until use they can be stored in the flat collapsed position, so that they occupy little space. Right before use, without this further requiring glue or extensive folding work, the box can be simply set up by pulling up the sidewall panels and folding the fastening flaps in the direction of two opposite sidewall panels.

[0003] A disadvantage of these known boxes is that they are not particularly stiff in construction. To still achieve a certain desired stiffness and stacking strength, these boxes are manufactured from a relatively thick, heavy type of cardboard, which takes relatively much material.

[0004] The object of the invention is to provide a collapsible box, in which the disadvantage mentioned is obviated, while maintaining the advantages thereof. To that end, a collapsible box according to the invention is characterized by the features according to claim 1.

[0005] By strengthening two opposite second sidewall panels of the box with an inner side panel and strengthening each corner with a substantially triangular tubular profile disposed substantially at right angles to the bottom panel, a constructionally very stiff box is obtained. The reinforced box can be manufactured from a relatively thin, at least light, cardboard type, while maintaining, or actually increasing stiffness and stacking strength compared with the known collapsible boxes. As a result, in comparison with these known collapsible boxes, a considerable amount of material can be saved and moreover a lighter box is obtained. Further, the tubular reinforcements in the corners enlarge the supporting surface of the box, so that the box is stackable still better.

[0006] The substantially triangular tubular profile is formed from a corner reinforcement panel, a second fastening flap and optionally a third fastening flap. The corner reinforcement panel extends from an inner side panel substantially diagonally to an adjacent first sidewall panel and is secured thereto with a second fastening flap. This second fastening flap may be folded inwards, thereby enclosing an acute angle with the corner reinforcement panel, or be folded in the opposite direction, thereby enclosing an obtuse angle with the corner reinforcement panel. In the first case, the second fastening

flap abuts against a flank of the triangular tubular profile, so that a very strong corner reinforcement is obtained, which is resistant to high stacking forces. Moreover, the second fastening flap in this position is better protected from tearing loose.

[0007] In the corner reinforcement panel, a tenth fold line is provided, parallel to a fold line with which the corner reinforcement panel is connected with the inner side panel. By virtue of this tenth fold line, the box is properly foldable and can be stored until use in a collapsed position occupying little space. Right before use, the box can be readily set up.

[0008] The shape and the size of the corner reinforcements, as well as the stresses prevailing in the corners can be influenced with the location of the fold lines between the inner side panel, the corner reinforcement panel, the second and optionally third fastening flap, as well as the location of the tenth fold line in the corner reinforcement panel. Thus, the size of the tubular profile can be increased by placing the fold line between the corner reinforcement panel and the sidewall panel more towards the middle of the respective side of the box. As a result, also when the box has a relatively small height, still a corner reinforcement of a relatively large size can be realized. Also, through the location of said fold lines, it can be influenced whether the corner reinforcement panel extends substantially diagonally to the adjacent first sidewall panel in a straight, angled or bent manner.

[0009] In an advantageous embodiment, a collapsible box according to the invention is characterized by the features of claim 3.

[0010] When the box is being brought from the collapsed position to the set-up position, the first fastening flaps are pivoted over the bottom panel. The bottom panel thereby exerts forces on the first fastening flaps. Also when the box is being held in the set-up position, the first fastening flaps are subject to forces from the bottom panel. Strengthening the first fastening flaps with a double-folded strengthening edge prevents, at least reduces the risk of, the first fastening flaps buckling or otherwise deforming permanently under the influence of these forces, as a result of which their retaining action in set-up position could at least partly be lost.

[0011] In a further elaboration, a collapsible box according to the invention is further characterized by the features of claims 6 and 7.

[0012] By providing the edge of each fastening flap that is remote from the bottom panel in the set-up position with a first stacking projection and/or the edge of each second sidewall panel or inner side panel that is remote from the bottom panel with one or more second stacking projections, the boxes can be stacked still more stably. The first and second stacking projections can, during stacking, engage in respective first and second recesses in the bottom panel of a superjacent box, or abut against the outer surface of the sidewall panels. In both cases, the stacking projections guide the placement of boxes straight above each other and they more-

over provide resistance to lateral shifting of the boxes. As a result, a straight, stable stack can be realized.

[0013] In a still more advantageous embodiment, a collapsible box according to the invention is characterized by the features of claim 8.

[0014] Boxes of which the first and/or second sidewall panels in set-up position taper slightly inwards can be stacked still more easily. The stacking projections thereby come to lie better in alignment with the recesses in the bottom panel of a superjacent box. In fact, the passages to these recesses are inwardly offset from the edge of the bottom panel by approximately one or two wall thicknesses, depending on whether the sidewalls located adjacent the recesses are of single- or double-walled design.

[0015] In a particularly advantageous embodiment, a collapsible box according to the invention is characterized by the features of claim 9.

[0016] The stackability of the boxes can be increased still further by providing the box with stacking edges. These stacking edges, in the set-up position, extend inwardly of the box, substantially parallel to the bottom panel, from a side of the first sidewall panels remote from the bottom panel. The stacking edges enlarge the stacking surface and enable a stable stacking. Moreover, the stacking edges increase the stiffness of the box still further, in particular also in lateral direction.

[0017] The invention further relates to a blank for a collapsible box, characterized by the features according to claim 12.

[0018] With a blank according to the invention, with relatively little material, a very strong box can be folded, having a high stiffness and stacking strength. Although the blank according to the invention is widened on opposite sides with an edge for the inner side panels, corner reinforcement panels and second and optionally third fastening flaps, and hence, as to surface, is greater than the surface of a blank for a known ready-to-use box of comparable dimensions, on balance, material can still be saved in that the blank according to the invention can be manufactured from a much thinner sheetlike material, in particular cardboard, without the box set up from this blank losing any stiffness or stacking strength.

[0019] With the relative location of the fold lines between the inner side panel, the corner reinforcement panel, the second and an optional third fastening flap, the size and the shape of the corner reinforcement of a box to be set up from the blank can be influenced and, in contrast to the known collapsible boxes, regardless of the height of the box, always an optimal corner reinforcement can be accomplished.

[0020] In the further subclaims, further advantageous embodiments of a collapsible box according to the invention, and a blank therefor, are described.

[0021] To clarify the invention, exemplary embodiments of a collapsible box according to the invention will be described with reference to the drawing. In the drawing:

Fig. 1 shows a perspective view of a corner of a collapsible box according to the invention, in set-up position;

Fig. 2 shows a blank part forming the basis for the corner part from Fig. 1;

Fig. 3 shows a perspective view of a corner of a collapsible box according to the invention, in set-up position, provided with stacking projections;

Fig. 4 shows a blank part forming the basis for the corner part from Fig. 3;

Fig. 5 shows a perspective view of a corner of a collapsible box according to the invention, in set-up position, provided with a stacking edge; and

Fig. 6 shows a blank part forming the basis for the corner part from Fig. 5.

[0022] In this description, the same or corresponding parts in the collapsible boxes and the blanks forming the basis therefor have the same or corresponding reference numerals.

[0023] Fig. 1 shows a corner portion of a ready-for-use box 1 according to the invention, in set-up position. Such boxes can be folded from a single blank 2, which blank 2 is manufactured from a sheetlike material, such as, for instance, cardboard. Fig. 2 shows a part of a blank 2, from which the corner portion shown in Fig. 1 can be set up.

[0024] The substantially rectangular blank 2 comprises a rectangular bottom panel 3, which, along two pairs of first and second fold lines 5, 7, extending at right angles to each other, is pivotally connected with a pair of first and second sidewall panels 4, 6, respectively. Each second sidewall panel 6, on two sides located approximately at right angles to the second fold line 7, is pivotally connected through respective third and fourth fold lines 9, 19 with, in succession, a first fastening flap 8 and a strengthening edge 18. The first fastening flap 8 and the strengthening edge 18, on a side proximal to the first sidewall panel 4, adjacent the shared fourth fold line 19, are provided with a projection, hereinafter called securing projection 24, whose importance will be discussed hereinbelow. With each second sidewall panel 6, further, an inner side panel 10 is pivotally connected, via a fifth fold line 11 located parallel to the second fold line 7. This inner side panel 10 is pivotally connected on opposite sides, substantially at right angles to the fifth fold line 11, with a corner reinforcement panel 12 via a sixth fold line 13, and each corner reinforcement panel 12 in turn is pivotally connected via a seventh fold line 15, parallel to the sixth fold line 13, with a second fastening flap 14. Optionally, with the second fastening flap 14 a third fastening flap 16 can be pivotally connected via an eighth fold line 17 located parallel to the seventh fold line 15, which is schematically indicated in Fig. 2 in broken lines.

[0025] For the benefit of the foldability of the box 1, each first sidewall panel 4 is provided with two ninth fold lines 20, and each corner reinforcement panel 12 with

a tenth fold line 22. These fold lines 20, 22 are so-called reversed fold lines and are indicated in Fig. 2 with a double line. When setting up the box 1, the blank 2, along such reversed fold lines, is folded over in opposite direction relative to the other fold lines, indicated with a single line. The ninth fold lines 20 extend diagonally from a corner 21 contiguous to the bottom panel 3, as far as a side located opposite the first fold line 5, and divide the first sidewall panel 4 into a trapezoidal part 4B located between the ninth fold lines 20 and two triangular parts 4A located on opposite sides of the ninth fold lines 20. 'Diagonal' is not herein to be taken as being limited to connecting two corner points. The tenth fold lines 22 in the corner reinforcement panels 12 run parallel to the sixth and seventh fold lines 13, 15 and divide each corner reinforcement panel 12 into two parts 12A,B. The blank 2 is further provided with two slit-shaped first recesses 25 at the boundary of the bottom panel 3 with each first sidewall panel 4 and two second recesses 27 at the boundary with each second sidewall panel 6, the use of which will be further discussed hereinafter.

[0026] The blank 2 can be folded into a box 1 as follows. The strengthening edges 18 are provided with glue and folded over along the fourth fold line 19 and stuck to the first fastening flaps 8. Each second fastening flap 14 and any third fastening flap 16 connected therewith is folded double along the seventh fold line 15 onto the inner side panel 10, whereafter the back (at that time facing upwards) of the fastening flap or flaps 14, 16 are provided with glue. Next, the inner side panel 10 is folded double along the fifth fold line 11 onto the sidewall panel 6, whereby the second fastening flap 14 is secured on a part of the first fastening flap 8 adjacent to the third fold line 9, and the third fastening flap 16, if any, is secured to a part of the second sidewall panel 6 adjacent to the third fold line 9. Thereafter, each first fastening flap 8 is folded along the third fold line 9 towards the inner side panel 10, so that at the same time the corner reinforcement panel 12 is folded double about the tenth fold line 22. The parts 12A and B located on opposite sides of this tenth fold line 22 can be folded against each other, either by their front side or by their back. In the first case, the tenth fold line 22 will move towards the third fold line 9; in the second case, by contrast, away therefrom. In this position, the securing projections 24 of the first fastening flaps 8 are located above the second recesses 27 in the bottom panel 3. Meanwhile, the first sidewall panels 4 are folded double along the first fold line 5 onto the bottom panel 3, whereafter the corner parts 4A are folded back along the ninth fold lines 20 on the trapezoidal part 4B and are provided with glue. The second sidewall panel 6 with the first fastening flaps 8 located thereon is subsequently folded along the second fold line 7 towards the bottom panel 3 and the first sidewall panels 4 located thereon. The securing projections 24 of the first fastening flaps 8, initially located above the second recesses 27, will thereby at least partly be received in this second recess 27 and the top

corners 4A of the first sidewall panels 4 will adhere to a corresponding part of the first fastening flaps 8 located thereon.

[0027] The collapsible box thus obtained is in the collapsed position. Until use, the box 1 is preferably stored in this position, since the box in this position occupies only little space. For use, the collapsed box 1 can be simply brought into the set-up position shown in Fig. 1 by pulling up the first and second sidewall panels 4, 6, until they are approximately at right angles to the bottom panel 3. The box 1 can be secured in the set-up position by pivoting the first fastening flaps 8 from the second sidewall panel 6 in the direction of the first sidewall panel 4 and securing them with the securing projection 24 in the first recess 25. This prevents the first fastening flaps 8 from pivoting back in the direction of the second sidewall panel 6. During pivoting of the first fastening flap 8, the securing projections 24 are slightly bent, so that these are dislodged from the second recesses 27 and can be pivoted over the bottom panel 3. The folded strengthening edge 18 of the first fastening flap 8 strengthens the securing projections 24, so that they do not buckle during the above-mentioned operations and hence maintain their intended securing action.

[0028] The triangular tubular profiles 23 formed in the corners of the box 1 in the set-up position by the corner reinforcement panel 12 and the second and any third fastening flaps 14, 16 increase not only the stiffness and stacking strength, but also the supporting surface of the box. Instead of folding the second fastening flap 14 inwards, as shown in Fig. 1, it can also be folded over in the opposite direction and be glued to a part of the first fastening flap 8 located next to the tubular profile 23.

[0029] The size and shape of the cross section of the tubular profile 23, in particular the extent to which it is open, and the attendant stresses in the corners, can be influenced by varying the dimensions of the corner reinforcement panel 12, the second fastening flap 14 and a possible third fastening flap 16, through placement of the sixth, seventh and an optional eighth fold line 13, 15, 17. With boxes of a small size, in particular a relatively small height H, the dimensions of the panels 12, 14, 16 forming the corner reinforcement 23 can be increased by laying the sixth fold line 13 at a greater perpendicular distance S from the third fold line 9, so that still a corner reinforcement profile 23 of a relatively large cross section can be realized.

[0030] By virtue of the reinforcements especially in the corners of the box 1, the blank 2 can be manufactured from a thinner, lighter type of cardboard than the blanks for comparable known ready-for-use boxes, without loss of stiffness and stacking strength. This is achieved in that the blank material is utilized more efficiently by the reinforcements, viz. much material there where during use large forces and high stresses will arise, in particular adjacent the corners, and less blank material there where the stresses to be expected during use will be lower. Through this more efficient use of

blank material, in comparison with the known ready-for-use boxes, a considerable amount of material can be saved.

[0031] Figs. 3 and 4 show, respectively, a corner and a corresponding blank part 2' of a second embodiment of a ready-for-use box 1' according to the invention. This second embodiment has been expanded, compared with the ready-for-use box 1 shown in Fig. 1, with four first and second stacking projections 28, 29, which in set-up position extend on the upper edge of the first and second sidewall panels 4, 6, in line with the respective first and second recesses 25, 27. With these projections 28, 29, the boxes, during stacking, can be placed straight above each other, while the first and second projections 28, 29 of a subjacent box 1' engage in the first and second recesses 25, 27 in the bottom panel 3 of a superjacent box 1'. As a result, a straight, stable stack is formed. The projections 28, 29 moreover provide resistance to lateral shifting. Instead of engaging in the recesses 25, 27, the projections 28, 29 can also abut against the outer surface of the respective sidewall panels 6, 4 of a superjacent box 1'.

[0032] The blank 2' shown in Fig. 4 substantially corresponds to the blank 2 from Fig. 2 and can be set up in an identical manner to form the ready-for-use box 1' shown in Fig. 3. The second stacking projections 29 are formed by a substantially U-shaped cut 30 provided in the inner side panel 10 of the blank 2', which cut 30 begins and ends adjacent the fifth fold line 11, opposite a second recess 27. When folding the inner side panel 10 double against the second sidewall panel 6 when setting up the box, the part of the inner side panel 10 bounded by the cut 30 will continue to stand in line with the first sidewall panel 6, thereby forming a stacking projection 29. The first stacking projections 28 are provided on an edge of the first fastening flaps 8, extending in line with the fifth fold line 11, straight opposite the securing projection 24. In each inner side panel 10, further, on an edge located opposite the fifth fold line 11, two notches 31 are provided, in line with the stacking projections 29. These notches 31 in set-up position are contiguous to the second recesses 27 and enlarge the passage thereof, so that, during stacking, the stacking projections 29 can engage more easily in the recesses 27. To further facilitate such engagement of the stacking projections 28, 29 in the recesses 25, 27, it is preferred, when assembling the box, to secure the first, second and any third fastening flaps 8, 14, 16, such that the first and/or second sidewall panels 4, 6, when bringing the box into the set-up position, can be pulled up maximally over an angle slightly smaller than 90 degrees. As a result, the first and/or second sidewall panels 4, 6, in set-up position, will incline slightly inwards from the bottom panel 3, and the upper sides of the stacking projections 28, 29 will lie straight under the first and second recesses 25, 27 of a superjacent box 1. For the same purpose, the second stacking projections 29 can be manufactured on the inner side panel 10 instead of on the outer wall panel

6, by providing the U-shaped cut 30 in the blank 2' from the fifth fold line 11 in the opposite direction, so that the projections 29 in set-up position are in line with the inner side panels 10, and hence more in line with the second recesses 27.

[0033] In Fig. 5 a corner of a third embodiment of a ready-for-use box 1" according to the invention is shown, wherein the first sidewall panels 4 on a side remote from the bottom panel 3 are provided with stacking edges 32 extending inwardly of the box. These stacking edges 32 enlarge the supporting surface and make the box still better stackable. Moreover, the stacking edges 32 enhance the stiffness of the box 1". Further, the edges of the second sidewall panels 6 remote from the bottom panel 3, just like the ready-for-use box 1' shown in Fig. 3, are each provided with two second stacking projections 29. Optionally, the corner reinforcement 23 can be expanded with a third fastening flap 16 which can be secured against the second sidewall panel. The structure of the box 1" is further substantially the same as that of the embodiments 1, 1' shown above in Figs. 1 and 3.

[0034] Fig. 6 shows a blank part 2" corresponding to the corner from Fig. 5. The blank 2" corresponds to the blank parts 2, 2' described in Figs. 2 and 4, as regards the bottom panel 3, the first and second sidewall panels 4, 6 connected therewith and the panels and flaps 8, 10, 12, 14, 18 and optionally 16, connected with the second sidewall panel 6. The first sidewall panel 4 is further pivotally connected, via an eleventh fold line 33 opposite the first fold line 5, with a stacking edge 32, which edge 32 is pivotally connected, along two twelfth fold lines 35 at right angles to the eleventh fold line 33, with fourth fastening flaps 34. For the benefit of the foldability, in each stacking edge 32, two thirteenth and fourteenth fold lines 36, 37 are provided. The thirteenth fold lines 36 extend in line with the diagonal ninth fold lines 20, from the eleventh fold line 33 as far as near a side located opposite thereto. The fourteenth fold lines 37 extend parallel to the thirteenth fold lines 36, from a corner point contiguous to the first sidewall panel 4, to a point close to the side of the stacking edge 32 located opposite the eleventh fold line 33. These thirteenth and fourteenth fold lines 36, 37 divide the stacking edge 32 into a part 32B, between the thirteenth fold lines 36, a part 32A, between the thirteenth and fourteenth fold lines 36, 37, and a part 32C on opposite sides of the fourteenth fold lines 37.

[0035] The box 1" can be folded from the blank 2" largely in the same manner as the two preceding embodiments. When folding over the first sidewall panels 4 along the first fold lines 5, also the stacking edges 32 connected with these sidewall panels 4 will end up on the bottom panel 3. Then the parts 4A, 32A, 32C, 34 located next to the ninth and thirteenth fold lines 20, 36 are folded back onto the trapezoidal part 4B of the first sidewall panel 4, whereafter the parts 4A are provided with glue. The second sidewall panels are subsequently

secured with the first fastening flaps 8 onto part 4A of the first sidewall panel 4 in the manner described hereinbefore. Finally, the parts 32C of the stacking edge 32 are folded along the fourteenth fold line 37 in the direction of the second sidewall panel 6 and secured thereto with a fourth fastening flap 34 connected with part 32C. The box 1" thus realized is in the folded position. To bring this box 1" in the set-up position, as shown in Fig. 5, the first and second sidewall panels 4, 6 are pulled up over an angle of about 90 degrees or slightly less, and the first fastening flaps 8 are secured with the securing projections 24 in the first recesses 25 in a manner corresponding to that described for the preceding embodiments.

[0036] The invention is not limited in any way to the exemplary embodiments shown in the description and the drawing.

[0037] Thus, the box can be provided with an appropriate lid. The sidewall panels can be provided with handles, air holes or other recesses. The first sidewall panels equipped with a stacking edge can be provided with stacking projections located in line with the first recesses, by providing a U-shaped cut in the stacking edge in the blank, which cut begins and ends adjacent the eleventh fold line. Further, per sidewall panel, more than two stacking projections and associated first and second recesses can be provided. The boxes can be manufactured from a different foil-shaped material than cardboard.

[0038] These and many variations are understood to fall within the scope of the invention as set forth in the following claims.

Claims

1. A collapsible box, comprising, in set-up position, a rectangular bottom panel (3), bounded by first and second upstanding sidewall panels (4, 6) located in pairs opposite each other, which are mutually connected with the aid of first fastening flaps (8) folded over approximately at right angles to the second sidewall panels (4, 6); wherein each first sidewall panel (4) is provided with two diagonal ninth fold lines (20), which extend diagonally from a corner point (21) contiguous to the bottom panel (3) to a point near a side remote from the bottom panel (3); wherein against the inner surface of each second sidewall panel (6) an inner side panel (10) is provided, which inner side panel (10), on two sides substantially at right angles to the bottom panel (3), is connected along a respective sixth (13) and seventh fold line (15) with, in succession, a corner reinforcement panel (12) and a second fastening flap (14); wherein the corner reinforcement panel (12) is provided with a tenth fold line (22) parallel to the sixth and seventh fold line (13, 15), and wherein the corner reinforcement panel (12) extends - from the inner side panel (10) substantially diagonally, straight, angled or bent, towards an adjacent first sidewall panel (4) and is secured thereto, at least to a first fastening flap (8) fastened to the first sidewall panel (4), with the second fastening flap (14).
2. A collapsible box according to claim 1, wherein each second fastening flap (14) is connected, on a side located opposite the corner reinforcement panel (12), with a third fastening flap (16) which is secured to a part of the second sidewall panel (6) contiguous to the first fastening flap (8).
3. A collapsible box according to claim 1 or 2, wherein the first fastening flap (8) is provided with a folded-over strengthening edge (18) at an edge which, in the set-up position, is located approximately at right angles to the bottom panel (3).
4. A collapsible box according to any one of the preceding claims, wherein the bottom panel (3), at the boundary with each first sidewall panel (4), is provided with at least two first recesses (25), and each first fastening flap (8), on a side, in set-up position, proximal to the bottom panel (3), is provided with a securing projection (24), which securing projections (24) in set-up position are received at least partly in said first recesses (25) in the bottom panel (3).
5. A collapsible box according to claim 4, wherein the bottom panel (3), at the boundary with each second sidewall panel (6), is provided with at least two second recesses (27), in which the securing projections (24) of the first fastening flaps (8) in set-up position are at least partly received.
6. A collapsible box according to claim 5, wherein each second sidewall panel (6) and/or inner side panel (10), on a side remote from the bottom panel (3), is provided with second stacking projections (29) located in line with the second recesses (27).
7. A collapsible box according to any one of claims 4-6, wherein each first fastening flap (8), on a side, in set-up position, remote from the bottom panel (3), is provided with a first stacking projection (28) located in line with the securing projection (24).
8. A collapsible box according to any one of the preceding claims, wherein the first and second sidewall panels (4, 6) and the inner side panels (10) include an angle with the bottom panel (3), which is equal to, or preferably slightly smaller than, 90 degrees.
9. A collapsible box according to any one of the preceding claims, wherein each first sidewall panel (4), on a side remote from the bottom panel (3), is provided with a stacking edge (32), which stacking

edge (32) in set-up position extends inwardly of the box substantially parallel to the bottom panel (3), and is secured with two fourth fastening flaps (34) to the adjacent second sidewall panels (6).

10. A collapsible box according to any one of the preceding claims, wherein the box is provided with an appropriate lid.

11. A collapsible box according to any one of the preceding claims, wherein the box (1, 1', 1'') is folded from a single blank (2, 2', 2'').

12. A blank for the manufacture of a box according to any one of the preceding claims, comprising a substantially rectangular bottom panel (3) and first and second sidewall panels (4, 6) located in pairs opposite each other, which are pivotally connected with the bottom panel (3) via respective first and second fold lines (5, 7), wherein each second sidewall panel (6), on two sides located approximately at right angles to the second fold line (7), is pivotally connected via third fold lines (9) with a first fastening flap (8) and further is pivotally connected, via a fifth fold line (11) located opposite the second fold line (7), with an inner side panel (10), which inner side panel (10), on opposite sides, approximately at right angles to the fifth fold line (11), is pivotally connected with, in succession, a corner reinforcement panel (12) and a second fastening flap (14), along a sixth (13) and seventh (15) fold line, respectively; wherein each first sidewall panel (4) is provided with two ninth fold lines (20), which extend diagonally from a corner point (21) contiguous to the bottom panel (3) as far as a side of the first sidewall panel (4) located opposite the first fold line (5), and wherein the corner reinforcement panel (12) is provided with a tenth fold line (22) extending approximately parallel to the sixth and seventh fold lines (13, 15).

13. A blank according to claim 12, wherein each first fastening flap (8), on a side proximal to the first sidewall panel (4), is provided with a securing projection (24), and the blank (2), at the boundary of the bottom panel (3) and each first and second sidewall panel (4, 6), is provided with, respectively, two first and two second recesses (25, 27), the perpendicular distance between the securing projection (24) and the third fold line (9) being equal to the perpendicular distance between, respectively, the first and second recesses (25, 27) and the respective second and third fold line (7, 9).

14. A blank according to claim 12 or 13, wherein each first fastening flap (8) is pivotally connected with a strengthening edge (18) via a fourth fold line (19) located opposite the third fold line (9).

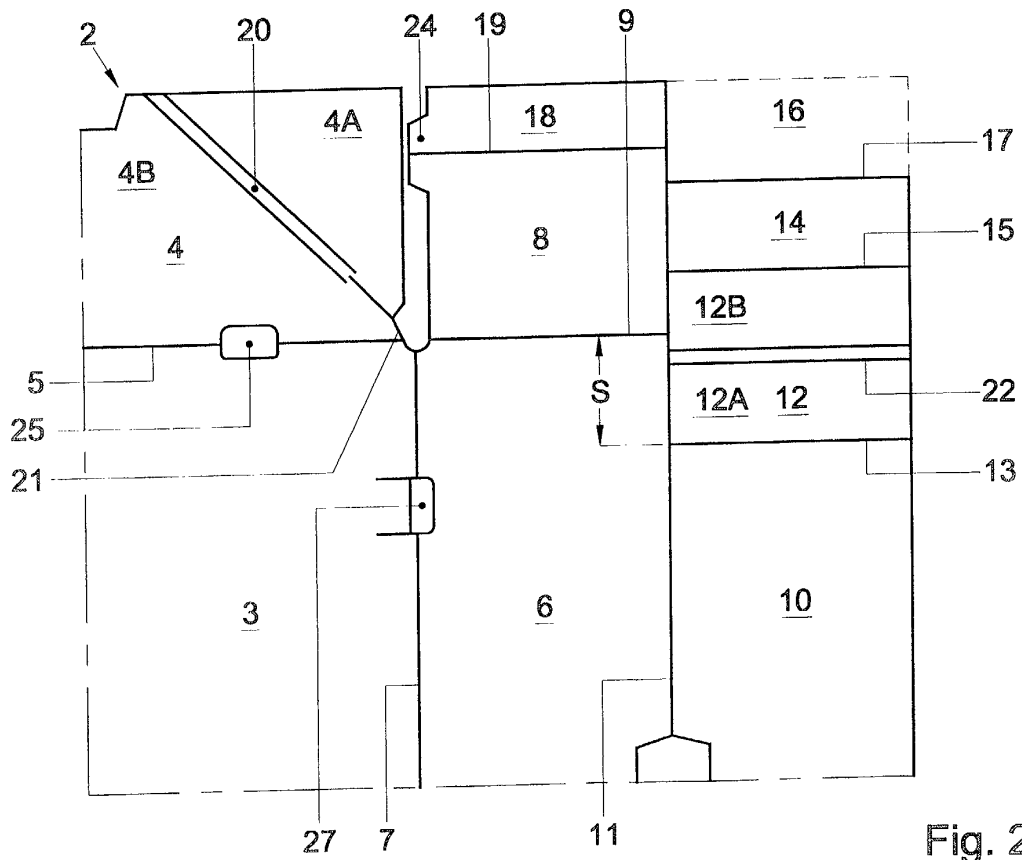
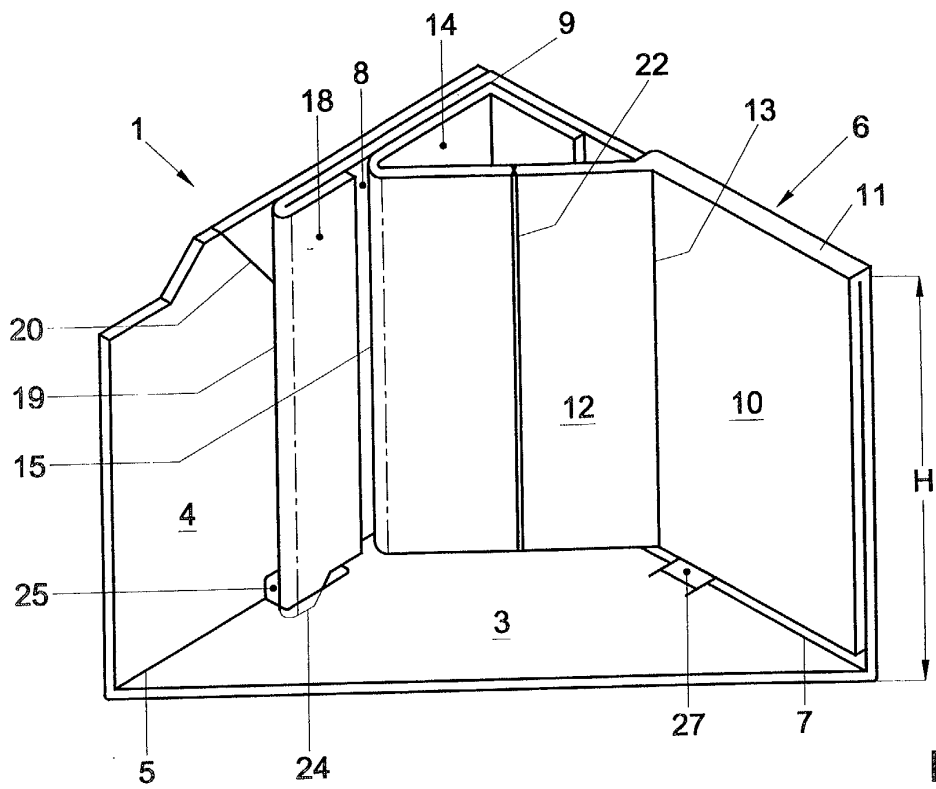
15. A blank according to claim 13 or 14, wherein each second sidewall panel (6) and/or inner side panel (10), adjacent the shared fifth fold line (11), is provided with two second stacking projections (29) located in line with the second recesses (27).

16. A blank according to any one of claims 13-15, wherein each first fastening flap (8), on a side located at right angles to the third fold line (9), proximal to the corner reinforcement panel (12), is provided with a first stacking projection (28) located in line with the securing projection (24).

17. A blank according to any one of claims 12-16, wherein the second fastening flap (14), on a side located opposite the seventh fold line (15), is pivotally connected with a third fastening flap (16), via an eighth fold line (17).

18. A blank according to any one of claims 12-17, wherein each first sidewall panel (4), on a side opposite the first fold line (5), is pivotally connected via an eleventh fold line (33) with a stacking edge (32), which stacking edge (32), on opposite sides, via two twelfth fold lines (35) located at right angles to the eleventh fold line (33), is pivotally connected with two fourth fastening flaps (34).

19. A blank according to claim 18, wherein each stacking edge (32) is provided with two thirteenth (36) and two fourteenth fold lines (37), which thirteenth fold lines (36) extend diagonally in alignment with the ninth fold lines (20) from the eleventh fold line (33) to a point near a side located opposite thereto, and wherein the fourteenth fold lines (37) extend from a corner point contiguous to the eleventh fold line (33), parallel to the thirteenth fold line (36), diagonally to a point near the side located opposite the eleventh fold line (33).



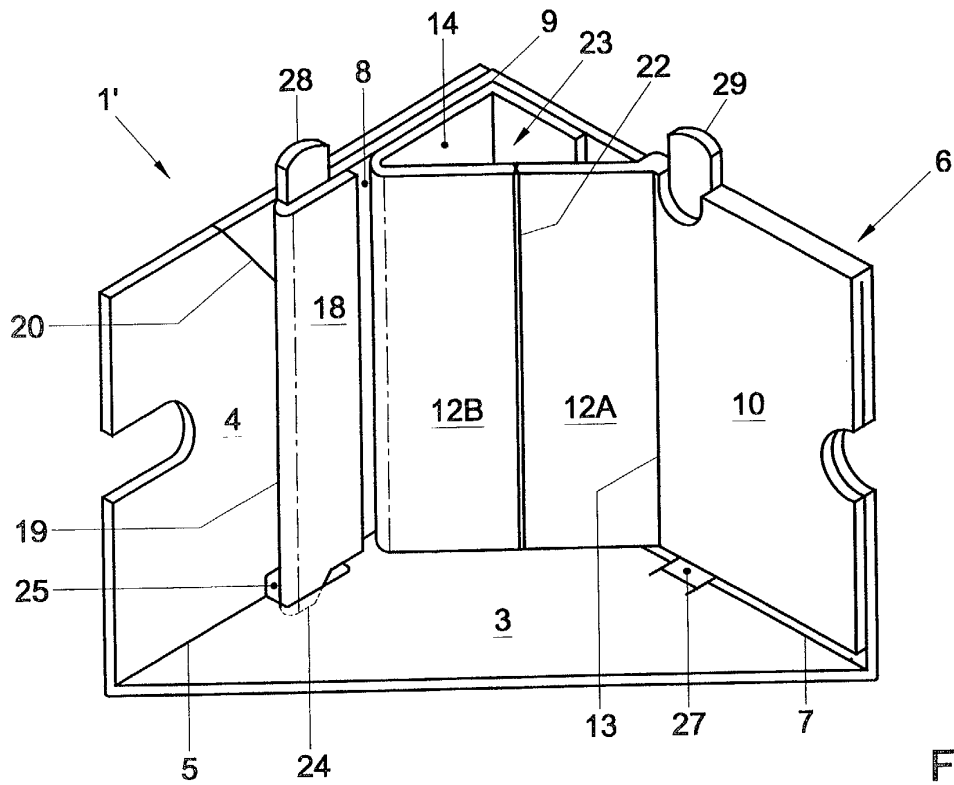


Fig. 3

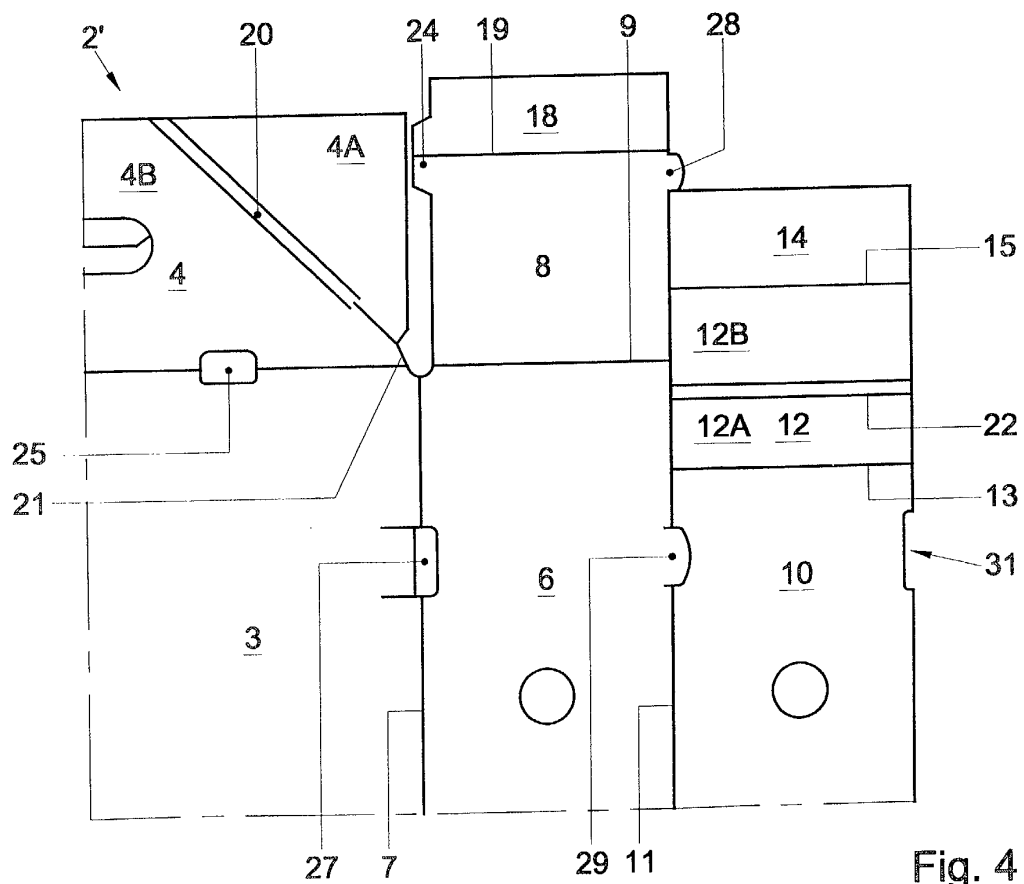


Fig. 4

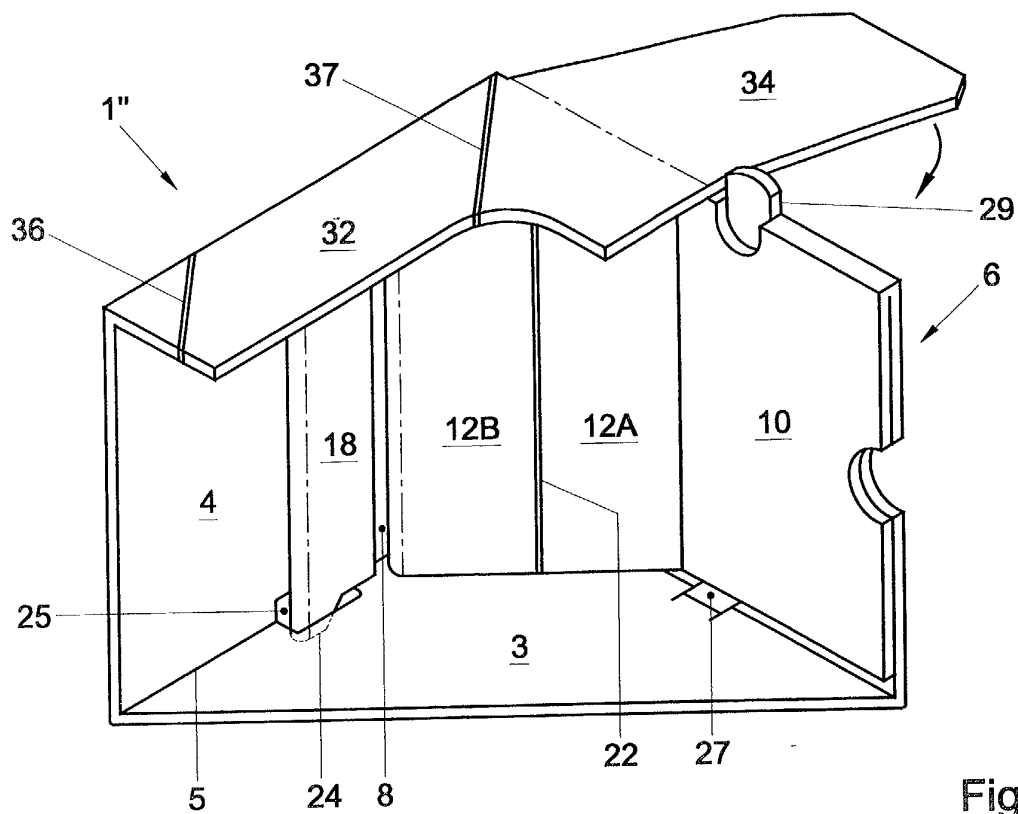


Fig. 5

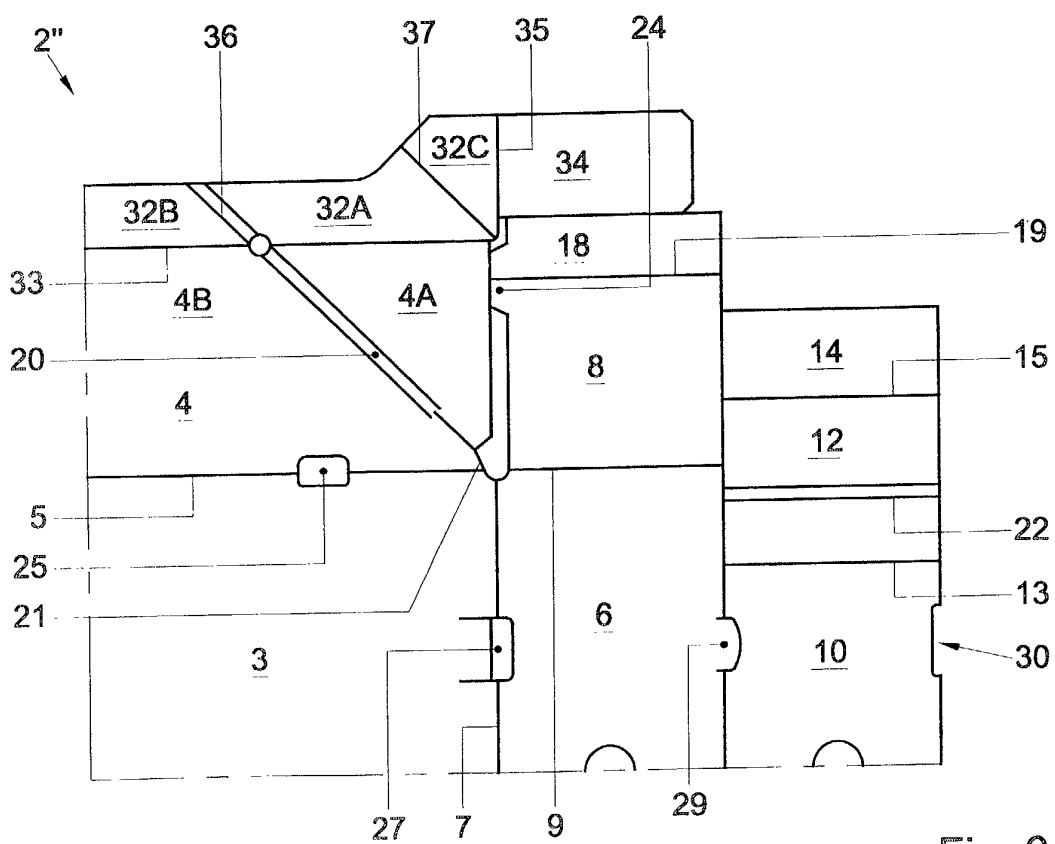


Fig. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 01 20 4899

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
A	EP 0 575 004 A (TRIMBACH VERPAKKING BV) 22 December 1993 (1993-12-22) * the whole document *	1,3-6,8, 10-13	B65D5/22 B65D5/36 B65D21/032
A	NL 9 202 028 A (SMURFIT LONA VERPAKKING BV) 16 June 1994 (1994-06-16) * the whole document *	1,3,4,6, 8-15,18, 19	
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
			B65D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 March 2002	Examiner Martin, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 20 4899

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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26-03-2002

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0575004	A	22-12-1993	NL EP	9201068 A 0575004 A1	17-01-1994 22-12-1993
NL 9202028	A	16-06-1994	BE	1007776 A3	17-10-1995

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82